A conceptual framework for the enhancement of trust in South Africa's fresh produce markets through the use of self-service technologies

by

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ABSTRACT

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KEYWORDS: e-commerce, electronic exchange, fresh produce markets, self-service technologies, structuration theory, trust.

Food is not a finite resource, as is the land it is cultivated on. Future generations will have to find creative ways to integrate production, marketing, distribution and technology in such a way that optimal usage of scarce food resources is achieved. Efficient fresh produce markets and specifically efficient electronic food spot markets could play a central role in stimulating, coordinating and optimizing the flow of food across multiple geographical regions. This cannot be achieved through traditional approaches to technology, as it requires systems to play a much more prominent role than just facilitating sales transactions. In order to establish electronic fresh produce spot markets of the future, we will require a deeper understanding of how broader institutional trust signals are to be facilitated through technology interfaces. This thesis explores the relationship between the use of self-service technology and the institutional environment emphasising the importance of understanding the relationship between technology's use and the specific institutional forces governing trust forming behaviour.

This thesis offers a rare insight into the functioning of a network of municipal fresh produce markets in South Africa which is characterized by a unique institutionalized trading environment that functions on high levels of trust between the grower, the sales agent and market authority. These markets share the same business model, governance framework, management and operational structure that has been designed specifically to provide a low risk, low cost marketing channel for fresh produce. Product is sold on a consignment only basis with an ad valorem commission being paid by the grower on the gross selling
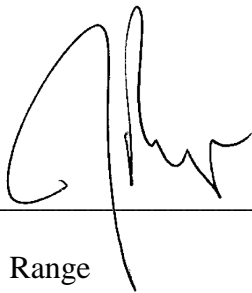
price. No written contractual agreements are in place governing this arrangement between the grower and the institution and if one takes into consideration that around R14 Billion (an estimated $1.1 Billion in 2014) are transacted annually in this manner, it is a remarkable example of how various institutional technological structures combine to facilitate such a trust driven environment. The use of self-service technologies have potential to revolutionise the role South Africa's network of fresh produce markets play, not only in the economy of South Africa, but also within the broader Southern African Development Community. But our understanding of how to structure solutions using self-service technology within fresh produce spot markets are still lacking. Given the importance of food security, the establishment of centralized food markets utilizing technology in creative ways would be vital to ensure the various economic, commercial and socio-political benefits flow back to the various stakeholders. The challenge fresh produce markets face is how to port the broader institutional trust dynamics it currently enjoys to an environment facilitated purely though technology interfaces. Although trust and technology are central to the functioning of these markets little research has been conducted into its role within these markets.

The study utilises a qualitative case study to document the dynamics of the social and technology environments on markets. The study reveals the importance of the alignment of technology, not only with the various business processes, but also with the formal and informal governance structures that regulate the activities internally and externally to the market environment. A conceptual framework is presented that illustrates the formation of trust within self-service environments.

DECLARATION

I declare that,

"A conceptual framework for the enhancement of trust in South Africa's fresh produce markets using self-service technologies", is the result of my own work and that resources used are referenced and acknowledged.

J.J. Range

DEDICATION

To my lovely wife and children who shared the ups and downs of this journey with me.

To my mother for her support over all these years.

To Sophie Roets (29 October 1952 to 10 June 2014): Of all the words in this thesis, this dedication is the most difficult to put down on paper. You did play a role in structuring me. I will for always be deeply sorry that I missed the opportunity to have met you.

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LIST OF PUBLISHED ARTICLES AND CONFERENCE PAPERS

Range, J. 2013. Presentation of research proposal at the IT Management Symposium entitled 'Challenges and Opportunities'. *Symposium presented by the Department of Informatics at the University of Pretoria*. 23 May 2013.

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APAC	Agricultural Produce Agent Council. Www.apacweb.org
ASEAN	Association of South East Asian Nations
DAFF	Department of Agriculture, Forestry and Fisheries
FAO	Food and Agriculture Organisation
FMCG	Fast moving consumer goods
GS1	International barcode standard, http://www.gs1.org/
HACCP	Hazard Analysis and Critical Control Points
ICT	Information and communication technologies
IS	Information System/s: "Information systems (IS, This is the means by which IS professionals and companies utilize technology to assemble, manage, save, employ and distribute information. According to Laudon and Laudon (1998, pp. 7-8) "an information system can be defined technically as a set of interrelated components that collect (or reserve), process, store and distribute information to support decision making and control in an organization."
IT	Information technology
JFPM/JM	Johannesburg Fresh Produce Market
	"JFPM" means Johannesburg Fresh Produce Market (SOC) Limited (trading as Joburg Market), a corporatized municipal entity incorporated in terms of the laws of the RSA.
LSM	The SAARF LSM (Living Standards Measure) has become the most widely used marketing research tool in Southern Africa. It divides the population into 10 LSM groups, 10 (highest) to 1 (lowest, Previously eight groups were used but this changed in 2001 when the new SAARF Universal LSM consisting of 10 groups was introduced (http://saarf.co.za/LSM/lsms.asp).
NAMC	National Agricultural Marketing Council. The National Agricultural Marketing Council was established in terms of the MAP Act No. 47 of 1996, as amended by Act No 59 of 1997 and Act No. 52 of 2001. The NAMC provides strategic advice to the Minister of Agriculture, Forestry and Fisheries on the marketing of agricultural products.
NFPM	National fresh produce market/s
PPECB	Perishable Produce Export Control Board (www.ppecb.com)
PROKON	Control for Agriculture (Prokon) renders quality assurance, product management and grading service to the South African fresh produce industry. http://www.prokonsa.co.za/
SST	Self-service Technology
ST	Structuration Theory
WHO	World Health Organisation

Part 1: Introduction and Background

CHAPTER 1: INTRODUCTION AND PROBLEM DEFINITION

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CHAPTER 1: INTRODUCTION AND PROBLEM DEFINITION

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"One of the things that people do not understand is that markets are creations,

they are not something that we can find; a market has to be created."

Ronald Coase (2012)

1.1 Introduction and background

We do not simply encounter markets as pre-existing institutions (Coase, 2012). Humans create, use and change markets deliberately to serve commercial and political agendas. This thesis explores the relationship between institutional trust-formation and the use of technology. Modern food markets have evolved from central town square styled meeting places into sophisticated production, logistical, financial and consumption eco-systems. These food markets play a central role in providing food security and food safety to a growing mostly urbanised population. But as illustrated in this thesis, the ability to migrate the multitude of services offered on fresh produce markets - which in the South Africa relies heavily on institutional trust - to a pure self-service environment faces numerous challenges.

Technology has the potential to play a pivotal role in enhancing trust in the various services food markets offer but to migrate to future electronic markets will require multidimensional frameworks with a broader and systemic perspective (Alt & Klein, 2011). The evolution from floor based trading to electronic market environment expose a range of socially embedded practices relating specifically to monitoring and signalling. Implementing self-service technologies, one has to consider the specific service context with its unique set of characteristics. One has to move away from the narrow transactional and techno-centric view that self-service technologies are simply about automating transactional workflows towards recognising the material influence of social practices of technology (Orlikowski, 2005a). Understanding the nature of this underlying socio-technical dynamics would assist us in understanding the provisioning of self-service technologies better:

> "... information systems reform depends not only on technical improvements but also on in-depth understanding of political, socio-cultural and administrative factors." (Indeje & Zheng, 2010:6)

> "Understanding the organizational, strategic and social implications of the IT-based transformation is required to understand the successful adoption and operation of electronic markets." (Alt & Klein, 2011:42)

Electronic markets as institutions consist of various governance structures, formal and informal methods of sanction and social norms. Bijman (2006) defines governance as inclusive of formal and informal structures informing a transaction environment. Just as in the case of a physical market place, trust

dynamics between the actor and institution defines the level of engagement actors have with electronic markets.

> "In today's world (of business) we have limited face-to-face contact with autonomous and fully self-responsible individuals and thus, in many situations, simply need to rely on unknown collectives of experts, i.e. representatives of the latter. This makes institutional-based trust a vital resource with regard to coordinating and governing the complex socio-economic world that we inhabit." (Bachmann, 2011:206)

Since the introduction of the Internet, we have seen a change in the way we interact with technology (Dutta, Dutton & Law, 2011). Giddens (1990:6) offers three perspectives on the change we see. Firstly, the "pace of change" is a lot faster than previous generations experienced. In an exponential manner, the Internet in itself allows for the rapid proliferation of information, knowledge and communication across the globe. This in turns fuels even more modes of change. Secondly, the "scope of change" is transformative in a way never seen before. Again, the Internet played a pivotal role and established a vast array of new connections across the globe (time and space) between people and institutions. This not only affects the distribution of knowledge and technology, but also the exposure to a world of knowledge exponentially bigger than in the past. Thirdly, technological changes affected the intrinsic nature of modern institutions. Through the ease of establishment of nodes within this growing global network, the traditional notion of institutions (social or commercial), are re-defined. With the global collapse of major state and private entities, institutional trust can be seen as the only realistic access point to repairing and maintaining trust in broader institutions:

> "The trust crisis is essentially due to a breakdown of macro-level trust, i.e. trust in (large) organizations. This is why we urgently need to know more about the development, repair, reach and potential of institutional-based trust." (Bachmann & Inkpen, 2011:4)

Given the growing importance of understanding institutional trust, we also need to understand the relationship between institutional trust and self-service settings. This thesis contributes to this discussion and develops a conceptual framework to assist our understanding of such environments.

Chapter 1 highlights the global challenge of food production and the important role that markets play in addressing food security internationally and in South Africa. Access to food markets and the ability to integrate these markets electronically into value chains are set to become a vital component ensuring the

sustainability of food production and consumption. The chapter also presents various calls for research into trust, especially institutional-based trust formation within electronic environments and concludes with the problem statement, key objectives and an overview of the thesis' structure.

1.2 Background and problem statement

It is essential to provide background to the research question in order to ground the research process within a specific context. Research questions needs to show its relevance as either part of theory building or addresses a crucial aspects related to organisations (Eisenhardt & Graebner, 2007). In addition Chapters 7 and 8 extends the discussion surrounding food spot markets and specifically the markets in South Africa in order to provide additional background. The following section introduces the broader problem of food security and how this would require us to look differently at the role of food spot market's use of technology.

1.2.1 Food production (2050)

Food is not a finite resource, as is the land on which it has to be cultivated. The traditional approach to food production will not be able to sustain a growing population and a dwindling production capacity (FAO, 2011). Future generations will have to find creative ways to integrate production, marketing and distribution methods in such a way that optimal usage of scarce food resources is achieved. Efficient fresh produce markets and specifically efficient electronic food spot markets could play a central role in stimulating, coordinating and optimizing the flow of food across multiple geographical regions. This cannot be achieved through traditional approaches to technology, as it requires systems to play a much broader role than just facilitating transactions. To achieve this objective the institutional relationship between technology's use and the specific institutional forces governing trust behaviour within these electronic markets needs to be understood. A practical example of how such an approach might assist various initiatives is illustrated in Figure 1.1. Within this financial services context, the integration of the grower and other role players into the broader approach is proposed to unlock the potential benefits offered by the whole technology eco-system. But as can be seen from this example, integrating and coordinating the interaction between each one of these role players assumes the existence of institutional trust structures.

"Improving supply chain efficiency: Mobile technology can improve communication between smallholders, distributors and retailers. Farmers and field agents can share information with retailers and distributors via mobile and distributors can track and trace the movement of produce and manage their fleets using machine-to-machine (M2M) technology." (Vodafone, 2014:36)

Relationships between the grower, its peers, suppliers and ultimately the broader institutions of government and financial entities, create a web of social and technical challenges for the functioning of SST solutions. Sharing of information, as an example, requires the stakeholders to trust each other. In the case of SST solutions, this trust relationship is not necessarily initiated and maintained through personal interactions, but rather through a technological interface. In Chapter 5 the various trust concepts highlights the fact that the use of technology removes the richness of signals in personal relations that allows us to form perceptions surrounding trust.
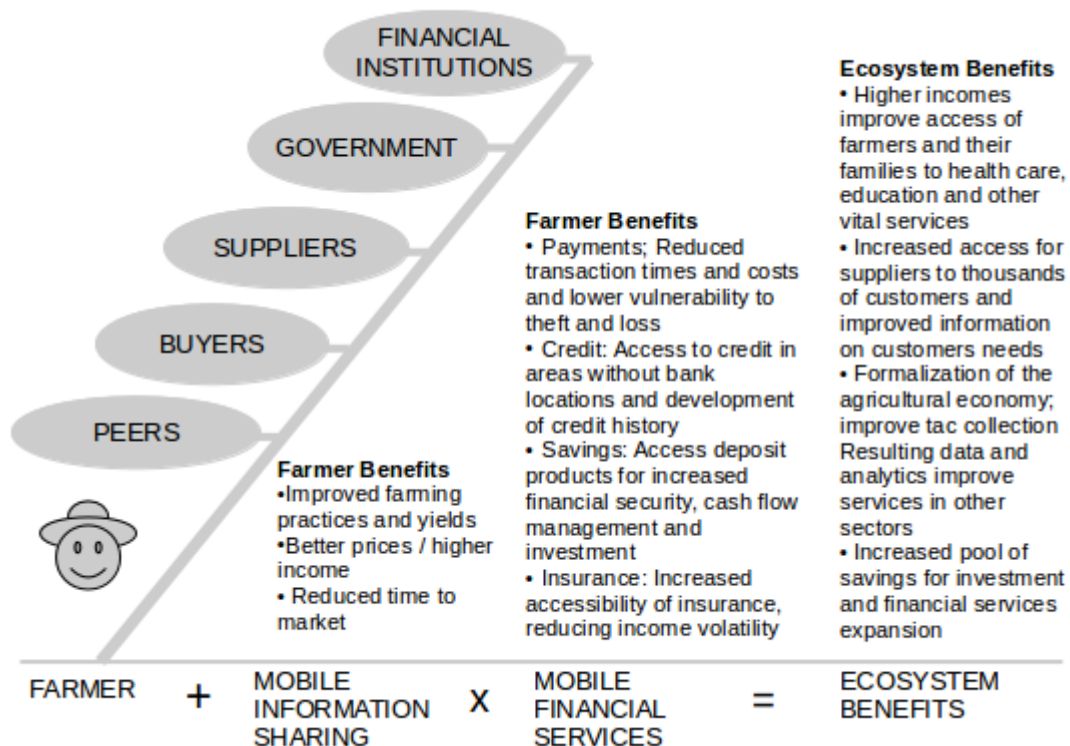
Figure 1.1: Broader technology eco-system
Source: WEF (2011:4)

Underlying this suggested technology layer there are numerous institutional relationships that have to be at a mature level to unlock the benefits such an initiative promises. Sharing of information, centralisation of data gateways, regulating and protecting the interest of all parties are some of the issues that require trusting relationships between the stakeholders. Information asymmetries alone would severely constrain adoption of self-service technology and this specifically affects the small-scale grower who is reliant of low cost information (Ochieng, Okello & Otieno, 2013).

> "Technology is set to play a critical role across the broader spectrum of market exchange dynamics. The greatest challenge to smallholder farmers in Africa is lack of markets although new developments point to linking them to specific markets. Since linking farmers to markets in Kenyan agriculture is a relatively new phenomenon, both at the level of government and the NGO/donor, it has not been established what works and what does not." (Kabiru & Lagat, 2013:389)

Nine billion people need to be fed by 2050 (WEF, 2009). That is 35% more people than in 2014 (FAO, 2009). Feeding a changing demographic of higher income, richer urbanised middle class populations that demand higher quality, safer, convenient and healthier food (Kabiru & Lagat, 2013; WEF, 2009) add to the challenge of future distribution infrastructure and the way technology should support it. Urbanisation of 70% (compared to 49% currently) will also require more efficient marketing services supplied through coordinated supply chains and centralised food markets.

The key growth areas are set to come from the 49 least developed countries (UN, 2013), the majority of which are situated in Sub-Saharan Africa. These countries are expected to double in population from 898 million in 2013 to 1.8 billion in 2050 and have mostly a younger population. Estimates are that 80% of the increase in production will come from productivity and yield factors with only 20% from arable land extension (FAO, 2009). Africa has the largest proportion of arable land available and many nations are looking to and investing into Africa (Deloitte, 2012). Renewed focus on Africa will place pressure on the sales and marketing infrastructure and will require enhanced electronic trading platforms.

Table 1.1 provides a summary of some of the key challenges facing food production and paints a challenging picture. We as mankind will have to be more creative in order to address these challenges.

Table 1.1: Fast facts: Challenges facing world agriculture
Source: WEF (2009)

There are 925 million hungry people in the world
World population is expected to grow from 6.7 to 9.1 billion by 2050
Food production will need to nearly double by 2050
About 40% of the world's arable land is degraded and will be further affected by climate change
There are 500 million small farms in developing countries supporting 2 billion people
GDP growth generated by agriculture is up to four times more effective in reducing poverty than growth generated by other sectors
Development aid to agriculture was at 4.3% in 2008 compared to 18% in 1979
Poor people spend 50%-80% of their income on food

In addition to growing population numbers, the cultivation of arable land, climate change and subsistence farming in developing countries contribute to the challenges agriculture planning poses to governments and private sector. Agriculture is responsible for 14% of the world's greenhouse emissions and 70% of its water usage making it not only an essential supplier of food but also a key consumer of resources (WEF, 2009).

Without a structured integrated approach to the use of technology from an institutional level, the investments into the various initiatives run the risk of being fragmented and duplicated leading to failure. Sustainable agriculture lies at the core of the African continent's ability to feed itself as well as the world. Nobel Prize winner, Sir W. Arthur Lewis states:

> "... an increase in agricultural productivity is fundamental to the solution of the problem of distribution since it makes possible simultaneous increases in mass consumption, saving and taxation…" (Lewis, 2004:86)

Given the multitude of challenges to future food production, various opportunities, specifically in the fields of distribution and marketing of fresh produce is emerging. There is renewed interest amongst government and the private sector into the relationship between agriculture, natural resources, economic development, global warming, water, land, food-security and population growth (FAO, 2011). To take advantage of these opportunities however, a re-alignment of policy and resource requirements has to occur on a macro and institutional level.

One of these focus areas are food markets, as these are critical to deliver food directly to the population through "…policies and programs to improve access to critical factors such as know-how, *markets* and the benefits of bulk buying and negotiation power" (Mail & Guardian, 2014:1, *own emphasis*). Indications are that radical changes are already taking place in the methods of production, processing, distribution and retailing in Africa. Focus falls on post-harvest technologies, traceability, cold-chain, measuring, monitoring of quality, argochemurgy, post-harvest waste and plant symbiosis. This renewed focus introduces new opportunities to "... access more organized and better remunerative markets for organized farmers, who are able to respond to new emerging market demands ..." (Kabiru & Lagat, 2013:391). Markets play a critical role to address a multitude of related issues and "…have demonstrated the potential to bring together agricultural stakeholders, food security and nutrition advocates and environmentalists to establish new partnerships and coalitions in the food system." (Ostrom & Lyons, 2012:71). This is illustrated by the recent investment into fresh produce market facilities by the Namibian government styled on the South African model, as part of their strategic plan to develop agriculture (See Namibia, 2006; Namfresh, 2013; Namibia, 2013; Namibia, 2015).

Regardless of the various policies that might be utilized to address the problem, the commercial viability of markets is crucial to the long-term sustainability of food security:

> "... the solution to food insecurity cannot be simply be linked to local and national policy interventions. The findings on food sources, in particular, *suggest a failure in the current food market."* (Battersby, Lennard & Crush, 2013:9, *own emphasis*)

Establishing sustainable food markets can only be facilitated through the provision of effective functioning of these markets as institutions. Looking into the future, these institutions need to embrace technology as more than just a transactional interface, but also as a tool to strengthen trust within the institutions itself.

Access to markets is a critical component of future agricultural growth (White & Gorton, 2006; Kumar, 2009; Mail & Guardian, 2014). The cost of conforming to modern standards, methods of production and the ability to access produce markets competitively, create a barrier to entry for especially medium and small-scale growers into commercial agriculture (Karippacheril, Rios & Srivastava, 2011). Small and medium growers tend to be price takers and they are exposed to the opportunistic behaviour of intermediaries due to inadequate access and unfair market practices (Deloitte, 2012; White & Gorton, 2006).

"Specifically, there is a need to develop and improve marketing outlets for producers and to improve marketing efficiency and competitiveness of existing vegetable markets. Any marketing support to small vegetable producers should focus on identifying and minimizing/neutralizing *the factors that help brokers and wholesalers to determine price to their advantage.* Any intervention should also be along the whole value chain as competitiveness of one market depends on the other that precedes or follows it. It is essential to design marketing strategy for increasing market chain competitiveness (both along the whole value chain and in a given market especially where vegetable growers sell the bulk of their vegetables." (Gebreselassie, 2012:225, *own emphasis*)

A broader geographical spread of growers and subsequent increases in large distances between supply and consumption require a higher level of transparent access to collective-market transactional information to reduce opportunism and in turn establish trust. The establishment of electronic exchanges utilising SST and the ability of stakeholders to trust and participate transparently in these exchanges form a key component of such future interactions.

The aim of this study is to contribute to the discussion surrounding these important topics by focussing specifically on the aspects surrounding technology's role on food markets. The following section looks at the challenges between developed and developing countries in more detail.

1.2.1.1   Challenges facing an integrated supply chain

Table 1.2 and Figure 1.2 highlight the gap that developing countries face in connecting producers and buyers to markets. We need to find creative ways through self-service technologies to provide these services under potentially challenging infrastructural scenarios.

Battersby-Lennard and Crush (2013) ask that the emphasis should be moved away from production/supply side approaches to food security and be shifted to distribution and marketing factors. In South Africa, even with its self-sufficient levels of production, the existence of food insecurity is pointing to inefficiencies from both a distribution and an affordability point of view. As in the rest of the world, food security forms a core part of South Africa's socio-economic strategy (Du Toit, Ramonyai, Lubbe & Ntushelo, 2011). Table 1.2 provides a summary of the specific challenges faced by the developing agriculture where technology and markets feature prominently.

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Table 1.2: Features of developed and developing country food systems
Source: ASEAN (2004:13, own emphasis)

Activities	Situation in Africa	Situation in Developed Countries
Agricultural food production	Overall low productivity due to traditional agricultural practices. Non-mechanized, rain-fed agriculture with little take-up of new technologies and innovations, such as drought-resistant crops. Insufficient production of marketable subsistence food.	Highly mechanized, intensive farming practices with full use of new technologies. Plentiful production geared to market demands.
Transportation/ distribution and communications	*Inadequate connectivity infrastructure between areas of high production and high consumption.* Inaccessible production areas due to poor state of rural roads and incomplete regional roads.	Infrastructure and connectivity meet the demand for rapid availability/ transportation of perishable and seasonal products.
Marketing	*Insufficient exchanges between sub-regions with different but complementary agricultural potential. Excessive increases in the prices of imported commodities from the global market. Poor economic, logistical and trade infrastructure.*	Modern marketing techniques to maintain the balance between supply and demand. Establishment of reasonable prices for products.
Processing	Very low industrialisation, where the pricing of products is generally artisanal. Low and unreliable electrification. Storage conditions poorly suited to urban consumption patterns.	Industrialisation of finished goods available for the growing urban consumption. Reliable electricity supply. Modern storage conditions to preserve perishable goods.
Storage	Insufficient or poor food stock reserves. Inappropriate storage structures.	Item stocks are sustainable and consistent with health requirements
Summary	High agricultural production capacity oriented to cash crops. High imports of basic foodstuffs with no control over prices in most countries. Low purchasing power of urban consumers. *Weak commercial linkages between national or regional geographic complementary areas*	High food subsistence production. Good linkages in infrastructure and modern technology. Easy access to the consumption of diversified food products. Better coordination of commercial exchange
Feature	**Developed Country Food Systems**	**Developing Country Food Systems**
Agriculture	Large scale, capital intensive, high technology units and small-scale (often part-time) farms, *with declining role for medium-size farms.* High yield, high input, labour and land costs. *Extensive use of forward contracts and futures for marketing of products, especially by larger farmers and declining auction markets.*	Small scale, labour intensive units, subsistence units at one extreme and large scale, plantation operations at the other**.** *Extensive use of informal contracts with agents or state controlled marketing agencies, spot markets and multiple intermediaries.* Low external inputs of physical and financial resources.
Distribution	*Dominance of hypermarkets and large supermarkets; declining share for Mom & Pop stores.* High volume/low margin. Direct supply into retailer warehouses from manufacturers. Diverse diets, consumer preferences. Competitive pressure to meet specific consumer demands. Focus on new product development. Increased presence of retailers' home brands or generic products	Fast growing demand. Fragmented retail market, multiple, small-scale outlets. Major shares of sales for wet markets, Mom & Pop, with increasing role for cash & carry and supermarkets for high- income areas. Basic staple diets, limited consumer preferences. Limited pressure for product development.

		Unbranded bulk products sold in retail wet markets. Fragmented, informal delivery system for processed products to retailers via multiple steps of wholesalers and handlers
Across-Chain Features	*Information technology - increasing role of information technology in input supply, production, marketing and distribution to enable logistics efficiencies. Food safety standards critical for customer assurance – requiring trace back. Dis-intermediation – elimination of intermediaries such as agents between farmers and processors, wholesalers between processors and retailers. Concentration increasing at every level of the chain – fewer and larger farmers, processors, retailers. Food consumed increasingly away from home – fast food and other restaurants. International focus - trade and investment activities to access faster growing markets in developing countries*	*Information technology – low levels of use. Multiple intermediaries between all stages of the supply chain. Low levels of concentration. Food consumed at home or at informal vendor markets. Domestic focus - attempt to meet competition from foreign products and outlets as they penetrate the market (mainly for high-end consumers0.*

Growers of the future will have to address standards, higher levels of regulation, food traceability, high value packaging and storage requirements to meet the growing demands of more formal supply chains (See Figure 1.2). Moving from a developing to a developed produce industry, an integrated and coordinated investment is required into the broader provision of services on markets through technology.

This section highlighted the challenges of food production and the potential role that SST use could play in addressing food security and access to fresh produce spot markets. Developing countries will need to adapt to these challenges and technology offers a valuable tool but more research will be required:

> "…understanding the complex system of agri-food chains requires more investments in retrieving empirical data for testing propositions and developing appropriate models."
> (Ondersteijn, Wijnands, Huirne & van Kooten, 2006:1)

The research problem this study seeks to highlight is the inability of self-service technology to effectively accommodate both social as well as technological aspects of institutional environments in a manner that enhances trust.

The following section introduces markets in the South African context, which offers an example of how formalized food markets can deliver on providing low cost and low risk market access using institutional trust as a key driver to unlock the collective benefit to the full spectrum of social, political and commercial role-players.
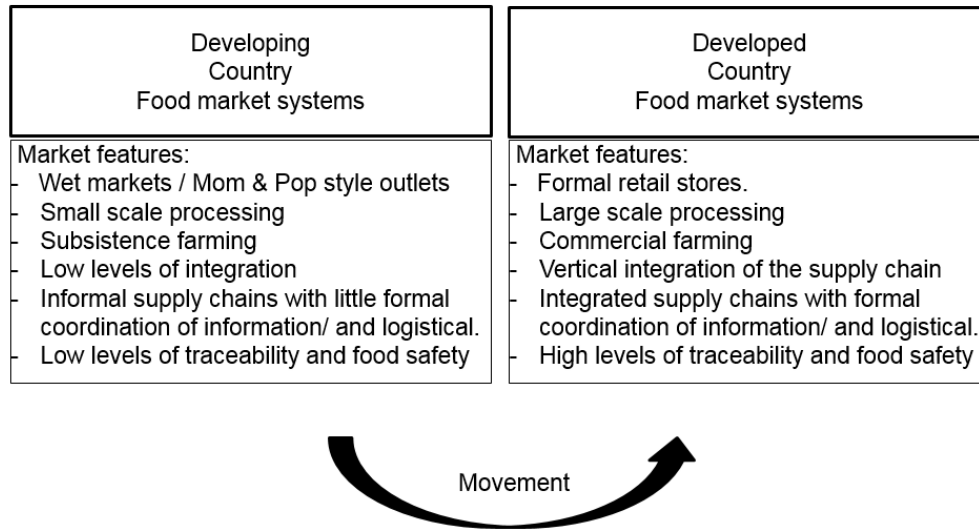
Figure 1.2: From developing to developed food market systems
Source: Adapted from ASEAN (2004)

1.2.2   Case environment: Fresh produce markets

This section introduces the case environment. Selection of a case environment should be done because they are:

> "…particularly suitable for illuminating and extending relationships and logic among constructs…They are chosen because they are unusually revelatory, extreme exemplars, or opportunities for unusual research access." (Eisenhardt & Graebner, 2007)

As will be discussed in Chapter 8, technologies role in fresh produce markets has not enjoyed large scale academic attention. Given the importance of this channel, more research is required.

One of the major marketing channels through which fresh produce is marketed in South Africa is via a network of Fresh Produce Commission Markets. This marketing channel was established as a low cost, low risk channel for producers in the early 1900s, reducing the barriers to entry, improving food security and ensuring that independent regulation/oversight is introduced where bulk produce is sold (IMASA, 2012:2013).

As the example from the potato industry illustrates (Figure 1.3), the South African fresh produce grower has a diverse marketing channel at its disposal. This combined with large volumes of product and high demand from lower income consumers provides sufficient supply and demand pressure to sustain markets.

Potato Study | Industry Overview

Processed market (5%)
4.55 million 10 kg bags

Export market (8%)
7.45 million 10 kg bags

To fresh produce markets (53%)
89.72 million 10 kg bags

Formal sector market (45%)
40.35 million 10 kg bags

Informal sector market (41%)
36.92 million 10 kg bags

Table Crop (88%)
168.40 million 10 kg bags

Not to fresh produce markets (47%)
79.13 million 10 kg bags

Processed direct (38%)
29.87 million 10 kg bags

Export direct (7%)
5.92 million 10 kg bags

Total crop
191.97 million 10kg bags

Trade direct (23%)
18.58 million 10 kg bags

Seed crop (12%)
23.57 million 10 kg bags

Seed certified (80%)
18.86 million 10 kg bags

Farm informal (10%)
8.23 million 10 kg bags

Seed uncertified (20%)
4.70 million 10 kg bags

Rural areas formal (21%)
16.52 million 10 kg bags

Figure 3: Distribution of potato crop in 2007
Source: PSA, 2009

National Agricultural Marketing Council
Strategic positioning of South African Agriculture in dynamic global markets

4

Figure 1.3: Potato Study an industry overview
Source: NAMC (2009:4, own emphasis in red)

South Africa's agriculture industry experienced large scale change during the 1990's, the results of which is still being experienced. Two major events affected the structural nature of the local industry; the 1995 liberalisation of trade and the 1997 deregulation of agricultural markets (Jooste, 2014). Former bureaucratic institutions (marketing boards and the fresh produce markets are examples) had to adapt to a more open and competitive trading landscape. The opportunities were exploited by private enterprise and that led to the growing institutional relationships between growers and retailers leading to produce bypassing the markets.

Fresh produce markets in South Africa are characterised by the participation of multiple stakeholders, trading on the same facility consuming a wide range of services. The role players are governed by a combination of legislation, by-laws, regulations and best practices specifically aimed at the governance

within these facilities. These markets all operate under the same rules and business model creating a network of similar markets forming a collective marketing institution within South Africa.

Fresh Produce markets forms important institutions within this context as they offer a collective eco-system within which the stakeholders can trade within very distinct boundaries. Institutions are described as:

> "Institutions are rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction" (North, 1991:3)

> "Institutions are human relationships that structure opportunities via constraints and enablement. A constraint on one person is opportunity for another. Institutions enable individuals to do what they cannot do alone." (Schmid, 2004:1)

Most of these markets are municipally owned with private market agencies operating under an operating license competing daily for product and buyers against fellow agents. The commission system in South Africa (estimated R14 Billion (DAFF, 2014)) are built on trust relationships through verbal contracts between the grower and the selling agent:

> "Farmers and fresh produce agents have an extraordinary trust relationship, bearing in mind that little, if any, arrangements or agreements are ever documented." (CHIPS, 2014)

This network of markets and the high levels of institutional trust that characterizes the relationships on markets were the result of many years of draconian enforcement of legislation and the establishment of various enforcement structures to ensure the protection of grower's produce and its proceeds. In South Africa, this channel plays a vital role in stabilising agriculture, stimulating production, keeping prices flexible and specifically ensuring the daily supply of fresh food to all Life Standards Measure (LSM) groups. However, South African markets need to re-position themselves for a changing future in which its relevance will not be determined by regulatory protection and subsidisation but by its relevance as a competitive role player in the value chain. Since 1990, the fresh produce industry has seen the gradual increase in the effect of formal retail, which seeks to exploit economies of scale and follow a direct-from-the-farmer approach via central distribution centres. Larger buyers (specifically retail) have moved away from sourcing produce on markets to establishing their own distribution networks bypassing the fresh produce markets. This growing trend places markets under pressure to maintain its position of relevance

in the supply chain. Retail supermarket business is expanding rapidly not only in South Africa but also into Africa increasing its demand for produce via a direct channel increasing its buying power. Without a structured response, this trend will lead to the markets becoming less relevant. SST offers the opportunity to enhance not only the services on markets, but to build on the high levels of institutional trust to extend its services and to be more competitive. Similar consolidation pressures led to high levels of concentration in developed countries where as much as 90% of trade is conducted through a small quantity of intermediaries (FAO, 2004; Hobbs & Young, 2001).

In response to the dominance of retail's power, growers have mobilized to return to farmer styled markets. Calling it the "cucumber revolt", Israeli farmers took the step to sell their produce directly to the consumer by bypassing the intermediaries (CHIPS, 2014). The grower is also in a position to sell produce not bought by the retailers in this case. The classical argument is that the "middle man" absorbs the profits and that the farmer is not compensated fairly. By taking their produce directly to consumers, the grower increases their margin and the consumer benefits from a lower price. An emerging trend in the US is the growth of farmers markets. Within the US, the term farmer's market represents a specific type of marketing channel for mostly smaller growers that seek to reduce their exposure to the power of retail buyers. Farmers markets in the US increased from 1 755 in 1994 to 8 144 in 2013 (Wiseman, 2014). In New York, farmer's markets have been established with an aim, "... to *take control back* from corporate industrial agriculture ..." (Kurlansky, 2007:35, *own emphasis*).

> "In this age of new concerns about intentional threats to food safety and security, farmers' markets offer a very local and widespread alternative to our nation's increasingly concentrated – and vulnerable – food and grocery distribution system." (Hamilton, 2002:2)

> "Farmers markets have persisted because of the clear economic and social benefits of creating a public space for buyers and sellers and other community members to come together and interact directly with one another." (Ostram & Lyons, 2012:72)

There is a need to shift power back to the growers. Off course, the argument is not simply about selling products directly to end consumers. As the distance, volumes, standards, etc. increase, so does the need for other value chain partners to introduce specialised services that exploit economies of scale (Woods, Velandia, Holcomb, Dunning & Bendfeldt, 2013). This requires an integrated approach.

> "The future of the fruit and vegetable chain will not only be built by an exclusive dialogue

between producer organisations and supermarket buying centres. So as to be more attractive to producers, producer organisations should be more open to other members and their working rules should be modified. *Institutional links should be established between producer organisations and wholesale market operators.* Dialogue should also be sought between inter-professional structures." (WUWM, 2007:2 *Emphasis added*)

As the discussion in chapter 8 will illustrate, the institutional structure of the South African fresh produce markets addresses power asymmetries in an elegant fashion providing for both the grower and buyer to transact in a transparent and competitive environment. The structure of the markets in South Africa provides a trading environment with low barriers to entry, regulated oversight, transparent information flows and a competitive trading environment, effectively levelling the playing field (IMASA, 2012). Given the benefits that the system offers growers and buyers, the enhancement of this marketing channel is of vital importance to the country's future. Implementing technology, specifically SST, in a structured and strategic manner offers benefits for the future in the following areas:

- Connecting large and small growers in an integrated manner to the market place;
- Development of competitive transactional models (and related hedging structures);
- Integration of the broader spectrum of stakeholders into the market;
- Increased transparency;
- Enhancing price discovery through transparent information flows;
- Extension of services to a broader SADEC and international markets.

This link between the grower, the market and the buyer on markets is illustrated in Figure 1.4. Fresh produce markets in South Africa are structured in a specific manner to address institutional trust between the major stakeholders. These markets provide a valuable example of an environment, which can act as a backdrop for studies into institutional trust structures where technology plays a central role.

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                        ┌─────────────┐
                        │   GROWER    │
                        └─────────────┘
                           │       │
                           ▼       ▼
   ┌──────────────────┐  ┌──────────────┐    ┌──────────────┐
   │                  │  │   MARKET:    │    │              │
   │ Self-service     │─▶│COMMISSION    │    │   OTHER      │
   │ technology       │  │  BASED       │    │  CHANNELS    │
   │                  │  │              │    │              │
   └──────────────────┘  │ Internal and │    └──────────────┘
                         │ External     │         │
                         │ Institutional│         │
                         │ Trust        │         │
                         │ Relationships│         │
                         └──────────────┘         │
                              │                    │
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                          ┌──────────────┐
                          │    BUYER     │
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```
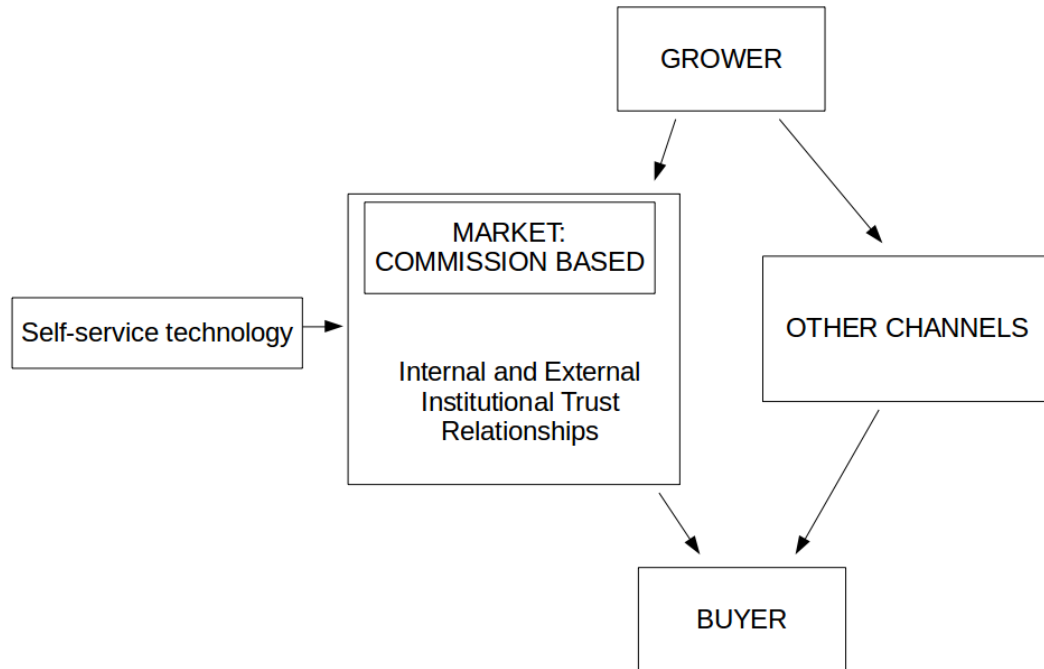
Figure 1.4: Commission markets as intermediary
Source: Adapted from Range and Leonard (2015b)

1.2.3 Introduction to key role players

To provide an introduction of the various stakeholders to the reader, certain key concepts are briefly presented. The initial clarification of terms such as market, agent, buyer and producer are required as it carries a slightly different meaning within the South African market context.

1.2.3.1 Agent

On international spot markets the term agent, broker or commission agent could refer to not only an agent acting on behalf of a supplier, but could also mean a buying agent, that purchases produce on behalf of buyers. The term agent is also used in terms of a wholesale agent, buying produce from the supplier and selling this produce to a buyer. Within the South African context the term agent has a very specific meaning. The activities of the agent is defined through a set of laws and regulations. Within this context, agents represent *commission only selling agents* functioning under specific legislation governing all aspects of their activities on markets. The Agricultural Produce Agents Act No. 12 of 1992 provides a very specific definition of a "fresh produce agent" within the fresh produce industry in South Africa:

"Fresh produce agent' means an agent acting as such with regard to any agricultural product specified in Part A of Schedule 1 on the basis that the risk of profit or loss at all times remains with the principal…" (South Africa, 1992)

The fresh produce agent never takes ownership of the grower's produce and has to act in the best interest of its grower (principal) at all times. The selling prices, the price the buyer pays for the produce, is the gross price the supplier receives and all costs of marketing of the fresh produce market is deducted transparently from this price. As will be discussed in chapter 8, the various sets of governance frameworks (formal and informal) are structured deliberately to counter opportunistic behaviour from the procurement and sales process and to provide protection for the grower's monies at all times. The way in which this is structured delivers an environment where trade is facilitated through less formal and cheaper contractual relationships built on trust. This structure also provides the basis for the claim of a unique trading environment in fresh produce in the world.

1.2.3.2   Producer

Throughout the literature, the role of a farmer is referred to interchangeably as a producer, supplier, grower, co-op facilities, importer, exporter, or just a farmer. The various business models on the supply side all produce different types of references. The term grower will be used as the preferred term for the collective group of suppliers of produce who owns the produce delivered on markets.

1.2.3.3   Fresh produce market

The term fresh produce market in the South African fresh produce industry depicts a very specific market environment. It is defined under the broader term of fresh produce wholesale markets, spot markets or food wholesale markets but the major difference in the South African context is *its purely commission based business model* where both agent and market authority receives an ad valorum commission based on the gross selling price (Other facility charges are deducted transparently from the gross revenue and reported as such back to the grower).

The general term market, according to the Oxford Dictionary is defined as:

"A regular gathering of people for the purchase and sale of provisions, livestock and other commodities." (Oxforddictionaries.com, not dated, b)

In the South African context these markets are referred to as municipal/private *commission sales markets or simply as markets* (*the market/s*). The markets are characterized by:

- Revenue is generated for both agent and market owners, through a commission charged on the gross sales price achieved by the agents.

- Fresh produce is the core product traded on the facilities and this also generates the bulk of the turnover.

- These markets are characterised by a very distinct *governance structure, business model and role allocations*.

- The series of commission markets function in an almost identical fashion sharing the same structure, business model and role allocations.

Reference will be made to wholesale or spot markets interchangeably when referring to food markets. For the purposes of this thesis, the commission markets will be referred to as fresh produce commission markets.

1.2.3.4   Buyer

The definition of a buyer in this context is along the generally understanding of the term buyer.

> "A person who makes a purchase." (Oxforddictionaries.com, not dated, a)

The buyer can range from an individual buying produce for personal consumption, to the retail buyer that purchases produce for a retail chain. In this study, the buyer will refer to a buyer of fresh produce. Buyers can also be intermediaries as part of an extended value chain. Importantly *agents in this context are not buyers* of the grower's produce and ownership only changes from the grower to the buyer when the sale is concluded.

1.2.3.5   Market authority/market management

Fresh produce commission markets are managed by a managerial team that is responsible for its various functions, which include the independent enforcement of rules to protect the interest of primarily the grower. In the majority of the fresh produce commission markets, the ownership of the facility lies with the city council. In referring to the management, the term market authority will be used to refer to these stakeholders. Within the various international spot markets, the role of the market authority differs greatly.

The role ranges from being passive bystanders to being actively involved in the operational aspects, information distribution and revenue collection. Within the fresh produce commission markets of South Africa, the market authority is actively involved in the management of the facility, the provision of auxiliary services and enforcement of regulations.

1.3 Motivation for study

The constant cycle of technological evolution, driven directly by the introduction of electronic computing and the Internet, has moved interaction from merely facilitation of a transaction, to the current social integration of technology as part of the service offering. This is a growing field of broader institutional trust to which this thesis aims to contribute. Trust at the institutional level can be defined as trust within third-party structures (Zucker, 1986). Bachmann (2011) states the following:

> "In future trust research, it is suggested to place considerably more emphasis on the 'constitutive' embeddedness of actors' behaviour in the institutional environment."
> (Bachmann, 2011:1)

Institutional-based trust formed within the institutional context is a critical element in environments where the probability of opportunism is present, as is the case in electronic facilitated environments. Perceived effectiveness of institutional mechanisms to support institutional-based trust consisted out of (Pavlou & Gefen, 2004):

- Feedback mechanisms (rating systems is an example)

- Escrow services (authorizing payment settlements)

- Credit card guarantees (recourse for fraudulent transactions)

- Trust in the market place intermediary

These elements are also found within fresh produce markets. Markets offer a variety of services over and above the actual sales transaction. We need to introduce service systems and the value proposition it offers, as foundational concepts for research (IBM, 2008).

> "These challenges to the status quo also throw up new forms of trust building that are worthy of academic investigation. Examples include new forms of relationships arising from e-commerce and virtual networking, or new forms of organizing that rely on

cooperation and collaboration." (Lyon, Mollering & Saunders, 2012:13)

Leonard and Strydom (2011) refer to the role of these wider contextual dynamics and the importance of understanding the impact of this on the service environment. The fact that the various mutations of trust can be identified on various levels of service delivery (physical, technological, temporal, social and emotional), would imply that a deeper understanding of the trust environment would contribute to our understanding trust as part of a wider industry specific context:

> "We have not bothered much and perhaps this is so in any newly developing research field, about the fact that 'sinroi', `gunaxi', 'vertrauen', or whatever we may find as translations of the word 'trust' in other languages, are to a large extent culture-specific concepts. We should take this seriously now and as a next step, become more ambitious, abandoning the idea that trust is a universal concept that remains the same at any time and everywhere." (Bachmann, 2012:131)

Technology is becoming more social and trust on the other hand becomes more institutional within ubiquitous electronic platforms. More institutional and inter-organisational trust research is required to understand these trust relations:

> "Because service systems can evolve into highly interdependent collections of entities, possibly dependent on global-scale 'service value chains', understanding the evolution of trust and mechanisms for supporting and enforcing trust are of great interest (e.g. eBay's reputation system)." (Spohrer & Maglio, 2008:18)

Self-service systems have the potential to be complex environments. Beatson, Lee and Coote (2007) state that because SSTs alter the dynamic of the service encounter, the impact of SSTs on the user environment have to be explored. The challenge facing research into trust and services is that both are contextual and occurs as part of a broader collective institutional environment. According to Barnes and Hinton (2007), the literature lacks clarity on the role that intermediaries play in the supply chain in an online context. Inter-organisational trust remains a major concern for firms trading as cybermediaries (Bachman & Zaheer, 2008; Steffel & Ellis, 2009).

> "While we have presented a strong case for governing with trust, more work is required to truly demonstrate the bottom-line impact of a Trust-Centric strategy when managing highly complex business exchanges." (Saban & Luchs, 2011:53)

Steffel and Ellis (2009) call for research investigating antecedents of trust as a basis of long-term organisational relationships within various forms of joint ventures, partnerships and alliances. Kim, Ferrin and Rao (2003) calls for research focussing on the role that the Internet plays on inter-firm relationships. Bachman and Zaheer (2008) call for the following elements to form part of research into trust:

- In future, trust research is to place more emphasis on the *'constitutive' embeddedness of actors' behaviour in the institutional environment* and to develop new insights into the role and functioning of trust in modern business systems.

- How *trust-building processes can be supported* is urgently needed in order to develop appropriate methods for policy makers to intervene in existing institutional arrangements.

- To gain deeper insights into *institutional-based trust (building processes)* is thus one of the most important issues on the trust research agenda.

- *The role of institutions in trust development is not yet sufficiently researched*. Much effort is still needed to unravel the subtleties of empirical cases where institutional-based trust can make all the difference (Bachmann & Inkpen, 2011).

As the technological networks remove the physical interaction between people, new meaning is attached to elements representing trust-forming signals. One of the frequently cited factors influencing the participation within electronic exchanges is trust (Lee & Turban, 2001). It is a *silent partner* in all transactions, which can either support or inhibit growth. Koch and Schultze (2011:123) refer to the "conflicted middle", the virtual space where conflict occurs. Since trust in a new relationship does not originate in a vacuum, we cannot sequence where to begin and go to next. Previous relationships and perceptions shape and determine how trust behaviour will unfold. Moody, Galetta and Lowry (2010) points out that the study of trust in these online settings could in turn further enhance our understanding of trust in off-line contexts, specifically the "predictors of trust".

To address these various issues, empirical research will need to focus on specific managerial situations and organisational contexts to examine the circumstances surrounding the transactions, relationships and the institutions that facilitates these (Bachmann & Inkpen, 2011):

"The characteristics of the institutional environment in which interactions are embedded are viewed as *constitutive elements in trust development processes in inter-organizational relationships*. The latter perspective, in our view, is very important and fruitful in terms of

theory building and the development of practically relevant management knowledge, not least with regard to trust building and trust repair strategies. However, this perspective has by far not been exploited in its explanatory potential yet." (Bachmann & Inkpen, 2011:11, *own emphasis*)

Canavari, Fritz, Hofstede, Matopoulos and Vlachopoulou (2010) point out the importance of trust specifically in the agri-food supply chain:

"However, concerns about trust seem to impede the development of electronic relationships in the agri-food chains as trust is of particular importance in any exchange of agri-food products along the value chain." (Canavari *et al.*, 2010:321)

For the South African industry to prosper the dynamics and specifically the trust dynamics within markets has to be better understood. This thesis contributes to the body of knowledge surrounding trust as called for by Bachmann (2012):

"...there are still many unsolved problems and there is no reason for the research community to rest in their efforts to refine our knowledge of trust." (Bachmann, 2012:131)

Viewed within the African and specifically South African context this call is timeous.

1.3.1 Self-Service Technology

For the purpose of this study the following definitions are used:

"Self-service technologies (SSTs) are technological interfaces that enable customers to produce a service independent of direct service employee involvement." (Meuter, Ostrom, Roundtree & Bitner, 2000:50)

"The self-service concept is very simple: customers themselves perform tasks that were once done for them by others." (Salomann, Kolbe & Brenner, 2006:66)

"These self-srvice technologies anable customers to perform entire services on their own without direct assistance from employees." (Bitner, Ostrom & Meuter, 2002:96)

The definitions share the key aspect that SST is a technological mediated relationship in which no humans are involved other than the user (Alcock & Millard, 2007).

As part of electronic exchanges, SST can play a pivotal role in stimulating development especially in the Sub-Sahara Africa where 33 of the 49 least developed countries are found (Datta, Byrd, Okoli & Mbarika, 2005).

> "… the role of trust in (vertical and horizontal) business relationships seems to be, conceptually as well as in empirical terms, so complex that many questions still need to be asked and answers pieced together before we can speak of a fully consolidated research field within management studies. Arguably, this is one of the least understood areas within trust research." (Bachmann & Inkpen, 2011:3)

The challenges faced by institutional structures like markets focus our attention on the:

> "... mobile information platforms open up significant additional routes to potential markets, relaying information on prices for inputs and produce sales, as well as information on how to grow and respond to a context of climate change …" (Vodafone, 2011:5)

The implementation of service technologies forms a significant investment for markets, thus the adoption and use of SST are critical to unlock value (Curran, Meuter & Surprenant, 2003). Determining the value that is created via SSTs is central to the provisioning of SST (Campbell, Maglio & Davis, 2011). To unlock the value proposition of SST the dimensions of such a value proposition has to be understood. But without an underlying understanding of the service context and the functional trust relationship between the various role-players, investments into these technologies would not yield a satisfactory outcome. Without an understanding of how to apply the technology to markets, the various infrastructure investments would be of marginal benefit. Our understanding of self-service technology within these food markets are still lacking. Self-service technologies are set to revolutionise service delivery as it gives us the opportunity to interact with products, services and people in completely new ways (brick-and-mortar to click-and-mortar) (Meuter *et al.*, 2000; Bitner *et al.*, 2002).

Electronic intermediaries perform four important functions (Baily & Bakos, 1997):

- Aggregation of demand and supply to achieve economies of scale and also to reduce bargaining asymmetry;

- The protection of participants against opportunistic behaviour of fellow participants by becoming an agent of trust;

- Reduce operating costs of infrastructure;

- Match buyer and seller requirements.

Debenham and Simoff (2006) propose three aspects that are critical to the establishment of online markets:

- Data mining - multiple information sources to be mined and aggregated information to be provided to users;

- Trading agents - the design of intelligent data agents that utilise the data flows used in data mining;

- *Virtual institutions - virtual spaces that resemble institutions structured to facilitate trade*.

The promise of complete disintermediation that the potential Internet world promised did not materialised rather three scenarios emerged; disintermediation in certain instances, re-intermediation through the adaption of work practises to new ways of working and cyber mediation where complete new markets emerged (Giaglis, Klein & O'Keefe, 1999). But in the structure of these market places is still not resolved as the following illustrates:

> "Understanding the organizational, strategic and social implications of the IT-based transformation is required to understand the successful adoption and operation of electronic markets." (Alt & Klein, 2011:42)

Broadly speaking, electronic markets are multi-dimensional by nature and need to be structured in the same manner as physical markets. This requires a deeper understanding of the trade context.

> "Technology is an important force in shaping the field, but needs to be complemented by considerations of the competitive environment and the setting of rules in order to ensure efficient and effective plays of the game." (Alt & Klein, 2011:41)

Regardless of the specific context the use of technology removes trust signals. According to Parlanti, Giuli and Pettenati (2006:64) the "... rich set of signals that can be cognitively exploited to access reciprocal 'moral' attitudes ..." through physical contact are partially removed with the user interpreting trust through digital means. This creates what Rowley (2006:341) refers to as an "impoverished experience"; the

removal of the multitude of cognitive signals used by the "truster" (the trusting party) to engender trust in the "trustee" (object, person or environment). We do increasingly experience a world through computerised technology (Stolterman & Force, 2004) and the reduction in cognitive trust signals through self-service technology does have the potential to affect the adoption of the technologies (Lanktona, 2014).

Electronic business environments are characterised by its impersonal nature, extensive use of technology as a medium, uncertainty relating to the technology artefact itself and the newness of the transaction medium (Pavlou, 2002). We know very little about the various factors that influence trusting behaviour within these environments in general and in ubiquitous systems specifically (Mansell, 2005). Trust has been identified by various authors as a challenge for the adoption and use of e-commerce (See: Bachmann, 2001; Cheskin Research, 1999; Kim & Benbasat, 2003; Meziane & Kasiran, 2008; Riegelsberger, Sasse & McCarthy 2005; Schniter, Sheremeta & Sznycer, 2012). Alcock and Millard (2007) highlight the relationship between trust and the adoption of self-service technologies as follows:

> "Trust is a big issue in self-service and a major reason why many customers do not use it. Many customers are happy to browse information on the Internet but then not actually purchase on line, or opt out at the point of submitting their credit card details." (Alcock and Millard, 2007:75)

With the growth of the service economy, the facilitation of services via electronic means will play a central role in the fresh produce supply chain. Self-service involves various forms of technology applications (Cunningham, Gerlach & Harpet, 2004):

- Online banking.

- Distance education.

- Airline reservations.

- Tax software.

- Retail self-scanning.

- Online auctions.

- Pay at the pump.

- ATMs.

- Online brokerage.

A multitude of potential applications are employed to deliver services electronically and thus in a service setting it cannot be narrowed down to being only the performance of the sales transaction. In this study, we are particularly interested in the suite of services that food markets offer (See Chapters 7-8) and the role SST could play within this context. The approach is not to demarcate the functionality to a definition but rather position SST as a conduit for trust signals. Using this approach positions SST as a tool to affect social structures (within the context of a structuration approach) as service encounters are critical access points into institutions (Bitner, Brown & Meuter, 2000).

Service research has not kept pace with the demand for more electronic facilitated services (Ng & Maull, 2009). Much is still to be learned from the interaction between customer and electronic self-service systems (Meuter, Ostrom, Bitner & Roundtree, 2003). The success of new electronic facilitated service will be determined primarily by the acceptability of the human interface of that service - whether it be based on an IT application or a revised person-to-person business process (Ramiller, Swanson & Wang, 2008).

How this combination of social-technical interfaces has to be structured still requires more research. The design of an effective service environment is an important element of service delivery (Reimer & Kuehn, 2005), but it remains under-employed (Pareigis, Edvardsson & Enquist, 2011). The adoption of SSTs still faces various challenges, specifically relating to the political, social, economic and technological environments (Leonard & Strydom, 2011). Past research into SSTs focused on aspects such as intentions to use and adoption of SST (Beatson *et al.,* 2007; Zhu, Nakata, Sivakumar & Grewal, 2013), security (Carter, Shaupp, Hobbs & Campbell, 2011), implementation and design issues (Naidoo, 2008) and SSTs contribution to service quality improvement (Hogstrom, Rosner & Gustafsson, 2010).

Interest in the field of SST is growing and there is a need for testable theories, conceptual models and frameworks (Naidoo, 2008). Specifically little is known about the manner in which self-service technology implementations are shaped by social, political, economic and technological. This is especially true in the fresh produce market context. Technology has not had the same integrative impact as is found in other industries. The provision of electronic self-service solutions has proven to be a challenge within South Africa's produce industry (Sherry, 2013). This is partly due to the properties of perishable products and partly because of high institutional trust-based relationships that are part of the commission-selling

model on markets. Self-service technologies could play a key role in linking market stakeholders to markets and building trusting perceptions.

Given the important future role that South Africa's agricultural sector and its markets are to play within the region, we have to understand the use of technology to take advantage of the benefits it offers. South Africa has an opportunity to exploit its network of fresh produce markets to take full advantage of more efficient food distribution and marketing through electronic self-service. Table 1.3 illustrates the growing importance of creating access to markets. A key part of any future strategy has to include the use of SSTs and the various trust dynamics.

Table 1.3: Mobile-enabled solutions for food and agriculture: Shortlisted opportunities
Source: Vodafone (2011:8)

Improving access to financial services	Mobile payment system Micro-insurance system Micro-lending platform	Increasing access and affordability of financial services tailored for agricultural purposes.
Provision of agricultural information	Mobile information platform Farmer helpline	Delivering information relevant to farmers, such as agricultural techniques, commodity prices and weather forecasts, where traditional methods of communication are limited.
Improving data visibility for supply chain efficiency	Smart logistics. Traceability and tracking system. Mobile management of supplier networks. Mobile management of distribution networks.	Optimising supply chain management across the sector and delivering efficiency improvements for transport logistics.
Enhancing access to markets	*Agricultural trading platform* *Agricultural tendering platform* *Agricultural bartering platform*	*Enhancing the link between commodity exchanges, traders, buyers and sellers of agricultural produce.*

A holistic approach and the collective support of the role players are required to unlock efficiencies of future technology implementation into this sector (Vodafone, 2011). Creating effective supply chains requires trust within an institutional framework that represents shared values and provides economic incentives for those participating (Vasileiou & Morris 2006). This thesis aims to contribute constructively to this growing conversation.

Figure 1.5 summarises the approach of this research study. Two types of transactions are illustrated, the

physical (hard) transaction and the social (soft) transaction. The physical transaction is facilitated through technology, which we observe as the manifestation of our interaction with institutions. However, a social transaction with the institution also exits, which ultimately influences the perceptions formed by actors around the trustworthiness of the institution.
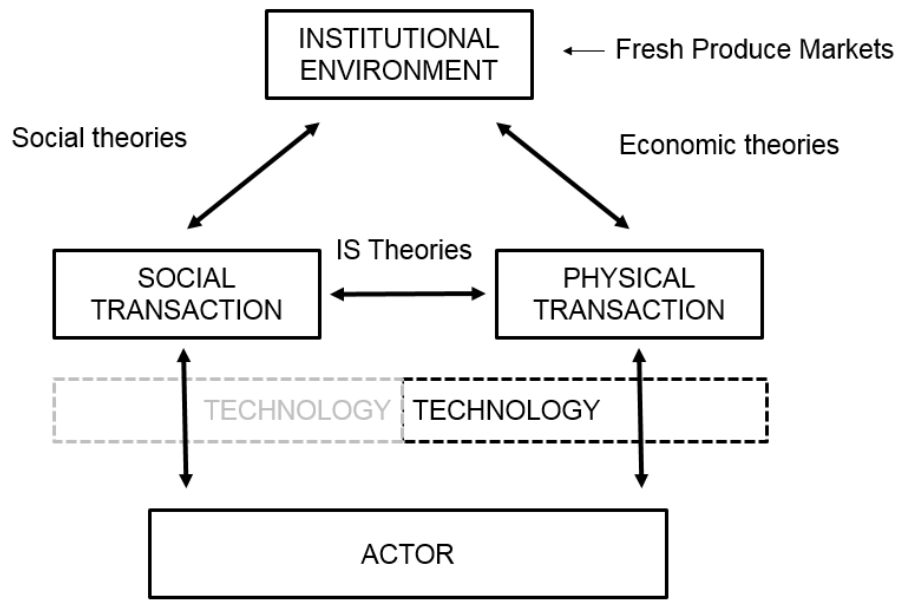
Figure 1.5: Conceptual view of the physical and social interaction between actor and institution

A rich body of knowledge exists, which describes this environment (economic, social and IS theories are some examples) but the one aspect that will require future academic attention, is how the facilitation of institutional trust signals via technology is to be approached. How to structure institutional structures to support self-service solutions and trust forming behaviour. The technology layer needs to be extended to cater explicitly for the issues relating to social trust formation. Within the extreme definition of SST, all trust signalling is to be facilitated through a technology layer as indicated, *especially in high trust environments such as fresh produce commission markets of the future*. (See Appendix B for the original patent for self-service).

1.4 Research questions

Having presented the research problem, the research questions are discussed within this section.

The preceding sections highlighted the following important points about the fresh produce market environment:

- Fresh produce markets are important institutions from a commercial, socio-political as well as socio-economic perspective.

- Agriculture rely heavily on technology to facilitate and enhgance trade through centralised markets.

The creation of electronically facilitated trade incorporating institutional trust dynamics could be a crucial aspect to ensure long-term sustainability of fresh produce markets. The approach is descriptive in nature and not normative. The thesis seeks to develop a conceptual framework that describes the functioning of environments in which self-service is introduced.

The following research questions form the core of the research approach:

Main research question:

What are the main components of a conceptual framework for the enhancement of trust using self-service technologies within fresh produce markets?

The aim of the research is to provide a conceptual framework that allows for a better understanding of the dynamics that make up fresh produce markets and how to facilitate trust forming behaviour as part of technology implementations.

Various sub-questions supports the main research question:

How can the provision of self-service technologies enhance trust in the institution of fresh produce markets?

The current services around the commission-selling model already function on high levels of trust. SST could complement this aspect and contribute to trust forming behaviour. The industry context of the research question (fresh produce markets) might not always be a topic with which readers are familiar. For this reason, effort is made to provide background to clarify the context through the introduction of chapters outlining certain key aspects guided by the research question (chapter 7-8 specifically).

What are the key elements involved in signalling trust within fresh produce markets?

What are those elements that influences perceptions surrounding trust in the institutional environment?

What are the relationship dynamics between trading partners in the fresh produce supply chain?

The fresh produce industry is a high-trust environment. The trust relationships between stakeholders and supply chain partners assists the facilitation of the transaction. The nature of this relationship needs to be clarified in order to understand this facilitation within electronic channels.

What are the potential challenges facing the governance of trust in SST environments like the fresh produce supply chain?

Governance structures provide assurance to trade participants (Williamson, 1999; 2005). This aspect lowers the perceived transaction cost of doing business in this channel. This question seeks to understand the governance issues within the trading environmnet.

What role does power play in the establishment and functioning of SST environments?

The interplay between power and the ability to influence relationships has a structuring effect on the nature of the provision of services. Central to this discussion is the role that technology plays in creating and sustaining these power relationships and in turn, how this affects trust.

1.5 Structure of the thesis

The thesis is structured as follows (See Figure 1.6): Part 1 (Chapters 1 and 2) presents the background including the research question, the research methodology and theoretical elements. Part 2 (Chapters 3 to 7) consists of the literature review focusing on institutional aspects surrounding trust, governance and the structure of international spot markets. Part 3 (Chapters 8 to 11) provides the empirical findings and conceptual framework with Part 4 (Chapter 12) reflects on the research study and evaluates its contribution. This approach is illustrated in Figure 1.6. This roadmap is presented at the beginning of each chapter.
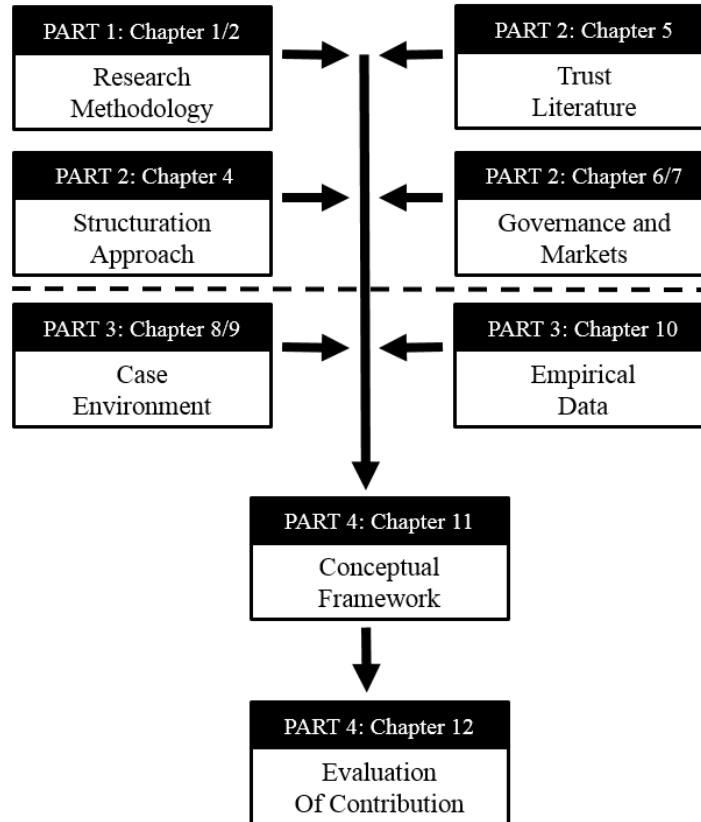
Figure 1.6: Roadmap to the thesis

1.6 Concluding summary

In this chapter the introduction and background to the problem statement is discussed. Both established commercial farmers and emerging farmers require access to well-structured markets for their success. Finding creative ways of implementing self-service technologies should form part of future strategies relating to the establishment of food markets. Technology is set to play an important role in the future development of agri-value chains and it is argued in this chapter that this will only be achieved if we succeeds in addressing the facilitation of institutional trust signals.

The research questions focus on the role of trust as part of the institutional environment of fresh produce markets. The aim of this study is to develop a conceptual framework that improves our understanding of trust within self-service environments. A brief outline was presented of the various chapters and showed how these inform the conceptual framework developed in Chapter 11.

The next chapter introduces the research methodology followed in this study.

Part 1: Introduction and Background

CHAPTER 2: RESEARCH METHODOLOGY

CHAPTER ROADMAP

PART 1 - INTRODUCTION

| Chapter 1 | Introduction |
| Chapter 2 | Research Methodology |

PART 2 – LITERATURE REVIEW

Chapter 3	Approach to the Literature Review
Chapter 4	Structuration Approach
Chapter 5	Trust Concepts
Chapter 6	Governance and Markets
Chapter 7	Introduction to Wholesale Markets

PART 3 – CASE ENVIRONMENT

Chapter 8	South Africa's Fresh Produce Markets
Chapter 9	Market Systems
Chapter 10	Discussion of Case Findings
Chapter 11	Conceptual Framework

PART 4 - CONCLUSION

| Chapter 12 | Conclusion and Evaluation of Contribution |

CHAPTER 2: RESEARCH METHODOLOGY

TABLE OF CONTENTS

"There is nothing more difficult to take in hand, more perilous to conduct,

or more uncertain in its success, than to take the lead in the

introduction of a new order of things."

(Niccolo Machiavelli, The Prince)

2.1 Introduction

This chapter presents the research methodology and underlying philosophical approach of the study. The first part of this chapter looks at the challenges facing IS research. Research in general is concerned with providing and contributing to theory and theory's essence is to provide explanations of observed phenomena (Ellis & Levy, 2008). The aim of this study is to develop a conceptual framework and this represents a suitable platform for such endeavours (De Villiers, 2005).

> "With respect to theory as a final product of the research, Eisenhardt notes that the output from case study research may be concepts, a conceptual framework, propositions or mid-range theory." (Walsham, 1995a:76)

Information systems (IS) research draws from a pool of reference disciplines (Goldkuhl, 2012) which allows for suitable approaches to the study of socio-technical environments. This socio-technology aspect however creates controversy relating to the relevance of the discipline itself, its methodologies and application. Given the research's complexity and all the arguments for legitimacy:

> "… members of any scientific field and particularly those belonging to fields struggling for recognition such as MIS, have to worry about the social and scientific status of their discipline." (Banville & Landry, 1989:48)

Inevitably studies into a social phenomenon such as trust deals with entities that ascribe "... various value-laden meanings by their human participants and researchers." (Avgerou, 2013:401). In the inaugural issue of the Journal of Trust Research (JTR) Li (2011) states:

> "JTR is particularly interested in those boundary-spanning studies that are interdisciplinary, cross-cultural, context-rich, cross-level, process-oriented and multi-method so as to effectively investigate the holistic content and dynamic process of trust, without the perils of reductionist bias and disengaged agenda." (Li, 2011:1)

For this reason, the first section of Chapter 2 briefly discusses the various challenges that emerge due to a more social-technical approach to IS research. Clarifying this aspect is important to contextualise the rest of the research process and to understand the advantages and disadvantages (limitations) that such an approach offers. The subsequent sections lay the foundation for the research study by firstly clarifying the

ontological and epistemological stance of the author and secondly addressing the specific research approach.

2.2 Information systems research – slowly growing up

IS research has a growing and some would argue, troubling, history from a research perspective, with some describing it as an "applied research field" suffering from "discipline immaturity" (Rose, Lindgren & Henfridsson, 2004). According to Avison and Pries-Heje (2005), the initial focus of IS research fell on the more mechanical automation aspect of IS processes. In the 1980s, management of IS become the dominant focus and during the 1990s the focus fell on the relationship between IS and the organisation. Since 2000, the continued infiltration of commercial and social issues became integrated into technology research. IS research has to be recognised as forming part of a broader environment in which the technological artefact interact with social actors. Figure 2.7 by Avison and Pries-Heje (2005) demonstrates this point.

IS as a research field is still in its infancy and is still confronted with constant self-reflection and controversy (Bannister, 2002; Walsham, 1995b). Research into technology also suffers from a difficulty in "... defining technology, establishing cause-effect relations and generating research results that generalise across technologies, users, contexts and time" (Fulk & Gould, 2009:764). According to King and Lyytinen (2004), the history of IS research suffers from an "anxiety discourse", a situation where theoretically IS finds itself in a sort of no-man's land, an aspect echoed by (Carr, 2003). Banville and Landry (1989:56) describes IS research as a "fragmented adhocracy", referring to the multiple theories and methods present in research projects.
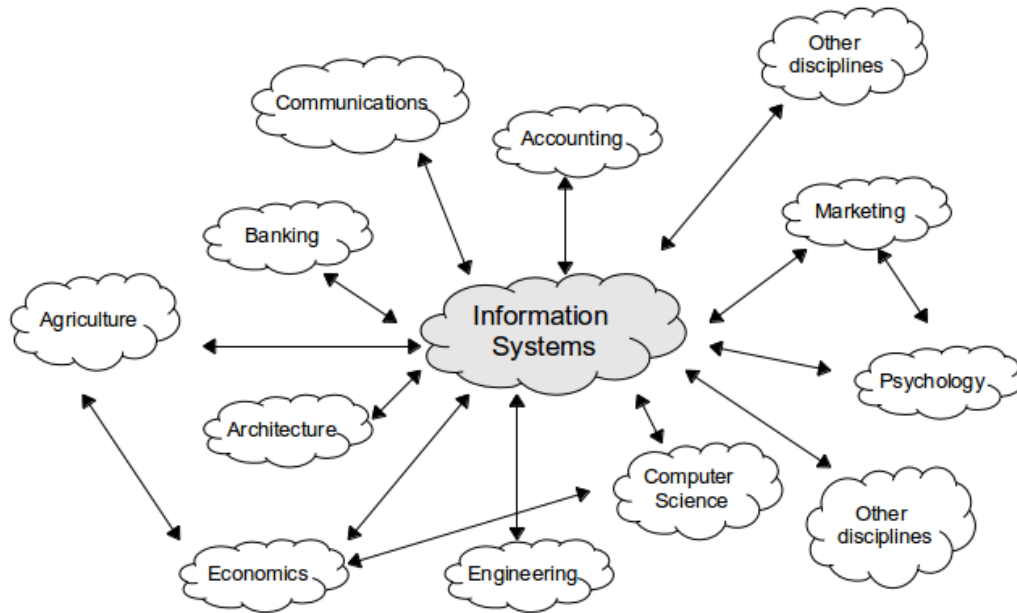
Figure 2.7: IS as a reference discipline in discourse with other reference disciplines
Source: Avison and Pries-Heje (2005)

IS is more than just software and hardware thus the interaction with the social environment surrounding IS requires us to lean on other disciplines for theory (Benbassat & Zmud, 2003; Lee, 1999). Questions regarding relevant frameworks, dispersion and empirical testing emerged in the 1980s and still surface as "paradigm wars" where battles rage between supporters of positivism against non-positivistic views (Tashakkori & Teddlie in Goles & Hirschheim, 2000:253). Authors such as Bannister (2002) even have the extreme view that IS research has reached diminishing returns.

IS research is however still young and constantly changing as reflected by the titles of articles over the years (See Table 2.1) and the fact that IS research is borrowing methodologies from the natural sciences could be seen as a sign of immaturity (Goles & Hirschheim, 2000).

"The study of information systems and their development is a multi-disciplinary subject and addresses the range of strategic, managerial and operational activities involved in the gathering, processing, storing, distributing and use of information and its associated technologies, in society and organizations." (Avison & Pries-Heje, 2005:187)

Table 2.1: List of Historical IS research articles

Can the Field of MIS be Disciplined? (Banville & Landry,1989)
Studying Information Technology in Organizations: Research Approaches and Assumptions. (Orlikowski & Baroudi, 1991)
Empirical Research in Information Systems: The Practice of Relevance. (Benbasat & Zmud, 1999)
Rigor vs. Relevance Revisited: Response to Benbasat and Zmud. (Davenport & Markus, 1999)
Research in Information Systems: On the Relevance of Practice in Thinking of IS Research. (Lyytinen, 1999)
Flogging a Dead Horse: The Implications of Epistemological Relativism Within Information Systems Methodological Practice. (Wilson, 1999)
Rigor in Information Systems Positivist Case Research: Current Practices, Trends and Recommendations. (Dubé & Paré, 2003)
The Identity Crisis within the IS Discipline: Defining and Communicating the Discipline's Core Properties. (Benbasat & Zmud, 2003)
Methodological Practice and Policy For Organisationally and Socially Relevant IS Research: An Inclusive–Exclusive Perspective. (Davison & Martinsons, 2011)
Research Methods and the Relevance of the IS Discipline: A Critical Analysis of the Role of Methodological Pluralism. (Sharma, 2011)
IS Research Methods: Inclusive Or Exclusive? (Lee, 2011)

However, Benbasat and Zmud (2003) call for IS to stand its ground and not to focus only directly on IS-related issues to establish relevance:

> "We are worried that the IS research community is making the discipline's central identity even more ambiguous by, all too frequently, under-investigating phenomena intimately associated with IT-based systems and over-investigating phenomena distantly associated with IT-Based systems." (Benbasat & Zmud, 2003:183)

Thomas Kuhn refers to these symptoms of struggle as perhaps merely the birth stages of a "paradigm", something that is yet to emerge:

> "No wonder, then, that in the early stages of the development of any science, different men confronting the same range of phenomena, but not usually all the same particular phenomena, describe and interpret them in different ways." (Kuhn, 1970:17)

A characteristic of IS research will be a constantly changing, diverse environment involving social, behavioural and organisational fields (Goles & Hirschheim, 2000). But new phenomena also have to be contextualised, defined and attract sufficient study to create credible theoretical groundwork. The quick

changing nature of IS environments does not provide enough time for research to lead to solid results on specific issues, especially if focussed on specific technologies. The approach of IS research is to react, seeking answers to constantly changing environments (Orlikowski & Robey, 1991). King and Lyytinen (2004) refer to this high rate of change as having a direct impact on the scope of IS research.

> "Because of the interdisciplinary research, IS scholars have emerged from varied academic backgrounds: organization science, computer science, information science, engineering, economics and management science/operations research. As a result, the theories embraced, the methods applied and the topics addressed by IS scholars are themselves varied, producing the diversity exhibited across the discipline." (Benbasat & Zmud, 2003:185)

From an epistemological perspective, the debate centres on the interpretivist versus positivist approaches. IS is a hybrid field dealing in many instances with the social dimensions of technology and interpretive approaches provide certain advantages as an approach (Editorial, 1993). Trust perceptions are a social phenomenon constructed by individuals and interpretive approach is best suited for this type of social phenomena (Myers, 1997). The interpretive nature of IS research allows for the documentation of case environments that otherwise would be lost to the field if a strict positivist approach was applied. Looking at the body of knowledge gathered during the last 40 years, interpretive research has provided a rich body of knowledge including softer issues. Through methods such as ethnography, hermeneutics and action research, additional context is created that would arguably not be available if only more positivistic methods were employed (Davison & Martinson, 2011).

Paradigm related arguments around interpretivism and positivism do not make the conversation any easier (Kling & Lyytinen, 2004). The debate around a suitable IS scope/focus and its theoretic core has not been resolved since introduced in the 1970s (King & Lyytinen, 2004). The "grey area" as referred to by (Whinston & Geng, 2004) is a source of uncertainty, but this should also be embraced. The debates about the various issues (ontological, epistemological and methodological methods) should be seen as symptom of the current state in which IS research is finding itself in.

However, this diversity does have a positive consequence leading to:

> "... epistemological eclecticism [and] involved the development of novel terminology; innovative research methods; non-traditional forms of evidence; and fresh approaches to

conceptualization, analysis and theory building." (Cameron, 2011:100)

The term paradigm has its origin in the writings of Thomas Kuhn's book The Structure of Scientific Revolutions. Defining it as:

> "By choosing it, I mean to suggest that some accepted examples actual scientific practice - examples of which include law, theory, application and instrumentation together - provide models from which spring particular coherent traditions of scientific research." (Kuhn, 1970:10)

Burrell and Morgan (in Goles & Hircheim, 2000:253) state that a paradigm is a "... commonality of perspective which binds the work of a group of theorists together". Kuhn (1970:23) holds that a paradigm is an evolving concept "... an object for further articulation and specification under new and more stringent conditions". It is clear that the intention of a paradigm is not a restrictive boundary-based phenomenon, but rather a temporary *coming together of the minds*. The lines paradigms draw in the sand are not there to be defended but to act as temporary boundaries until we can extend our understanding past this, or as Patton (1980) refers to it, the paradigm of choices.

Proposing a single research perspective would be restricting IS research (Orlikowski & Baroudi, 1991). In this manner, paradigms are viewed as general conceptual ideas and rather than be led by the paradigm, the subject under investigation leads and guides the literature for the academic context and issues of legitimacy. The emergence of a single paradigm is perhaps illusive but might be undesirable and calls for single paradigm might be premature (Banister, 2005).

> "It is our belief that paradigmatic unity (or more specifically, paradigmatic dominance) is fundamentally undesirable. It is done at the expense of constraining the domain of inquiry by taking one viewpoint and construing all others through its lens. This we argue leads to a reduction in the variety of research approaches and limits their potential cross-fertilization. Instead, paradigmatic pluralism is needed. Indeed, paradigmatic pluralism should not simply be tolerated, but a goal the IS community should strive for." (Goles & Hirschheim, 2000:263)

The following section elaborates on the choice of an interpretivist approach.

2.3 An interpretivist stance

The approach in this study is distinctly interpretivist. The argument surrounding the positivist versus interpretivist is not an exclusionary one. Both simply provide alternative dimensions and are supplementary to each other (Chen & Hirschheim, 2004). A pro-active approach is perhaps better than the reactive and defensive approach followed until now. But as Knox (2004) states, methodological pluralism can still be accommodated and explained, but that philosophical pluralism is problematic.

Regardless of all the criticisms against interpretive research, the body of knowledge surrounding IS would be knowledge poorer if those research efforts did not occur. Being a discipline that is in its infancy, the contribution of wider contextual approaches offers valuable parallel paths in the forest. As Barley (1990) notes:

> "Yet, regardless of calculated attempts at discipline, fieldwork inevitably intensifies the tensions, the relationships and the serendipitous events that influence all research. It is in the precarious balance between the controlled and the uncontrolled, the cognitive and the affective, the designed and the unexpected that fieldwork finds its distinctive vitality and analytic power." (Barley, 1990:220)

Within the interpretivist paradigm, reality is contained in socially constructed aspects such as language, shared meaning and consciousness (Avison & Pries-Heje, 2005). This is in contrast to positivism where the world is an external construct for which objective quantitative measures should be employed in research (Knox, 2004). Positivist approaches assume existing relationships within the research environment that needs to be uncovered through structured researched methods. Reality is objective and can be described in measurable terms, independent of the researcher (Avison & Pries-Heje, 2005).

> "The positivist approach, one might note, actually regard philosophy of science as pretty much equivalent to all of philosophy, given their view of philosophy. And while philosophy of science today is much more heterogeneous, it retains many of the epistemological concerns of its earlier 'analytic' heritage." (Ihdey, 2004:118)

Interpretivism on the other hand uses more qualitative type of approaches, which place the human actor as a central part of the construction of IS. Understanding is gathered through looking at the meaning people attach to IS (Avison & Pries-Heje, 2005). The intention is to understand the subject within its natural

setting. Interpretive approaches are distinctly non-deterministic in nature. Human actors rely on their subjective interpretations of the phenomenon to create sense from the world around them. Methods include field studies, ethnography and grounded theory; grounded theory being a special case where discovering theory occurs through the interaction with field data (Avison & Pries-Heje, 2005). Through the process of interacting with the data, the researcher's view is challenged. The dynamism of the IS environment requires the methods employed to take cognisance of this. To accommodate this, the approach involves a deeper level of interaction with the research subject and the data generated. Knowledge creation is ideographic, concerned with understanding the meanings generated in the data (data being a combination of interviews, field notes and documents).

IS research has to consider *the social aspects of its environment* but in such a way that academic relevance is not lost. As Barley (1998) warns:

> "Being at the forefront of technology carries potential dangers, however. Perhaps because technological changes are more obvious, if not more rapid, than changes in other areas of social life, researchers in our field run the risk being too easily enamoured by the novel."
> (Barley, 1998:238)

According to Lee (2001:412) IS examines "*... more than the technological system, or just the social system or even the two side by side, in addition, it investigates the phenomenon when the two interact.*" It is with this social approach as a point of departure that the research presented in this thesis is approached.

2.4 Ontological and epistemological view

According to Goles and Hirschheim (2000:250), the key questions confronting any research in social sciences are "... how do we know what we know?" and "... how do we acquire that knowledge?" How to turn *doxa* (what we believe is the truth) into *episteme* (what we know is true)? As a first step, the researcher has to contextualise the approach and interpretation of what is observed.

Ontology refers to our perceptions of being in the world:

> "Ontology is the study of being, of what exists and of what is think-able. It determines what types of entities constitute reality. Ontology questions the real nature of entities, how do they come into being and why." (Resca, 2009:1)

The ontological view of the author is that reality is created by the individual within a social context (thus, reality is socially constructed). This is a view shared by key authors such as Lee (1994), Myers (1994) and Walsham (1993). Humans create their environment and are not just a product of their respective environments (Lee, 2004).

Epistemology is how we learn and acquire knowledge in the world:

> "Epistemology refers to how we know what we know. Therefore, rather than focusing on the object of the investigation, it concentrates on how knowledge can be acquired on the entities being examined. This means that epistemology has to do with methods: theories, concepts, rules and the procedures applied within a discipline in order to derive at knowledge." (Resca, 2009:1)

The author's epistemological view is that knowledge is constructed within social contexts and that it cannot be separated from the holder of that knowledge. Knowledge creation is subjective and focus should fall on meaning within the research context. A narrow focus leaning on quantitative methods should be avoided.

> "Empirical research can be defined as the practice of observing and intervening into information systems as they are." (Boland & Lyytinen, 2004:58)

Knowledge emerges through dialectical interaction with subjects given a specific context.

> "Knowledge consists of those constructions about which there is a relative consensus (or at least some movement towards consensus) among those competent (and in the case of more arcane material, trusted) to interpret the substance of the construction. Multiple "knowledges" can coexist when equally competent (or trusted) interpreters disagree." (Guba & Lincoln in Gregor, 2006:615)

The above has certain methodological implications. Methods are employed to extract the "knowledge" from the environment. A particular paradigm perspective does influence the approach and introduces certain methodological bias into the process (Ramiller, Swanson & Wang, 2008). The approach followed here is ideographic, highlighting the unique elements of the case. This opens the research process to

potential bias from both the researcher and the research environment, something that Klein and Myers (1999) contextualised as part of the following framework:

- The principle of the hermeneutic cycle

- The principle of contextualisation

- The principle of interaction

- The principle of generalisation/abstraction

- The principle of dialogical reasoning

- The principle of multiple interpretations

- The principle of suspicion

These principles are used in Chapter 12 as part of the evaluation of the thesis. It is important to recognise these principles as part of the research approach in the beginning as this assists us to guard against potential errors caused by bias.

IS research and IS practice are influencing each other in a structuring manner. Not only is new theory built and new practices encountered, but the theory itself is also introduced as the narrative encountered by subsequent researchers in their research endeavours. From this narrative, new theories and practices are constructed and introduced back in a continuous cycle. Figure 2.8 illustrates how both the IS research and IS practise environments draw on each other.

From a research perspective, the lingo (signification) and various tools (resources) are used during the research process and researchers are subject to norms in the form of peer review processes. IS system practice is similarly exposed. As new technologies are introduced, it influences the IS practice field which in turn influences the technology approaches. Power is vested in these systems but exposed to the interactions of both new technologies and changing requirements (Booland & Lyytinen, 2004). We see the process as that of social construction and structuration (Booland & Lyytinen, 2004). It is a reflexive one in which we acknowledge the inherent subjectivity of research agency but also the structural role that the tools and methods of IS research plays (See Cardoso & Ramos, 2012a:2012b).
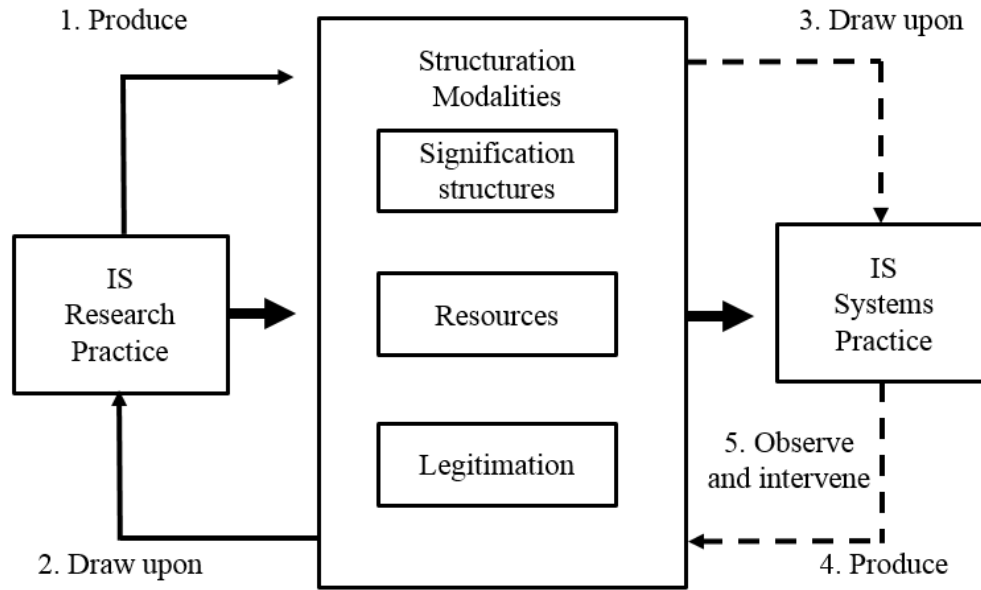
Figure 2.8: Structuration processes and IS research
Source: Boland & Lyytinen (2004:59).

Returning to IS in its broader context, Figure 2.9 and Figure 2.10 illustrates the broader and diverse nature of IS. The figures highlight the leaning towards a softer social approach, requiring suitable tools to capture issues that are more diverse.

> "... IS emphasizes the applications of technology rather than a focus on fundamental technologies and theories. It focusses more on interactions between people and organisations (the 'soft' issues) and technology rather than on technologies (the 'hard' issues) themselves." (Avison & Pries-Heje, 2005:189)

IS is a social-technical research field which poses some distinct challenges when considering ontological, epistemological and methodological aspects. A social approach suites the approach of this study. DiMaggio (1995) suggests that one looks at the purpose of theory rather than simply at the theory as singular construct. This aspect is discussed in the next section.
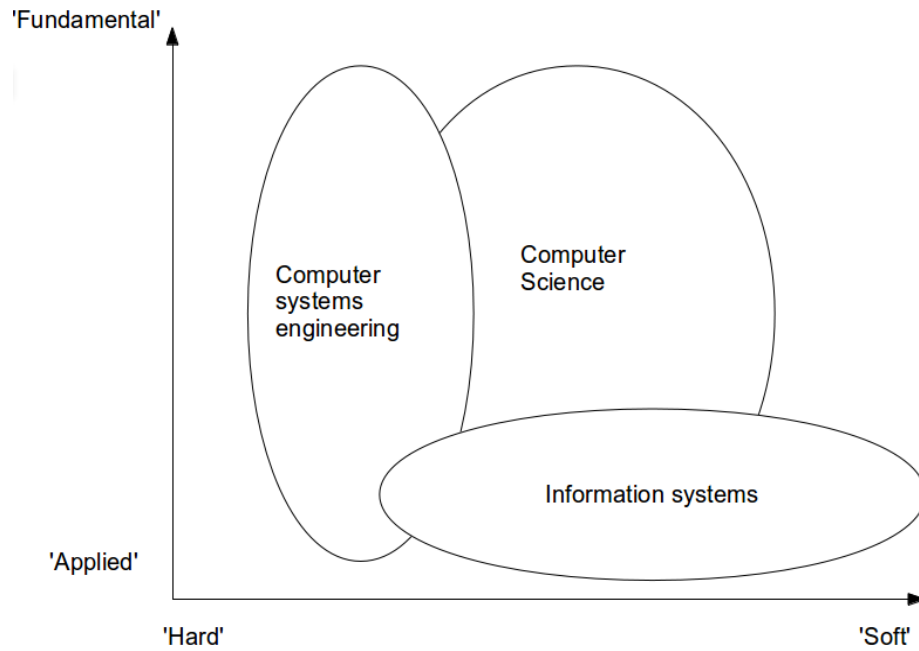
Figure 2.9: Differentiation of IS from other IT disciplines
Source: Avison and Pries-Heje (2006:190)
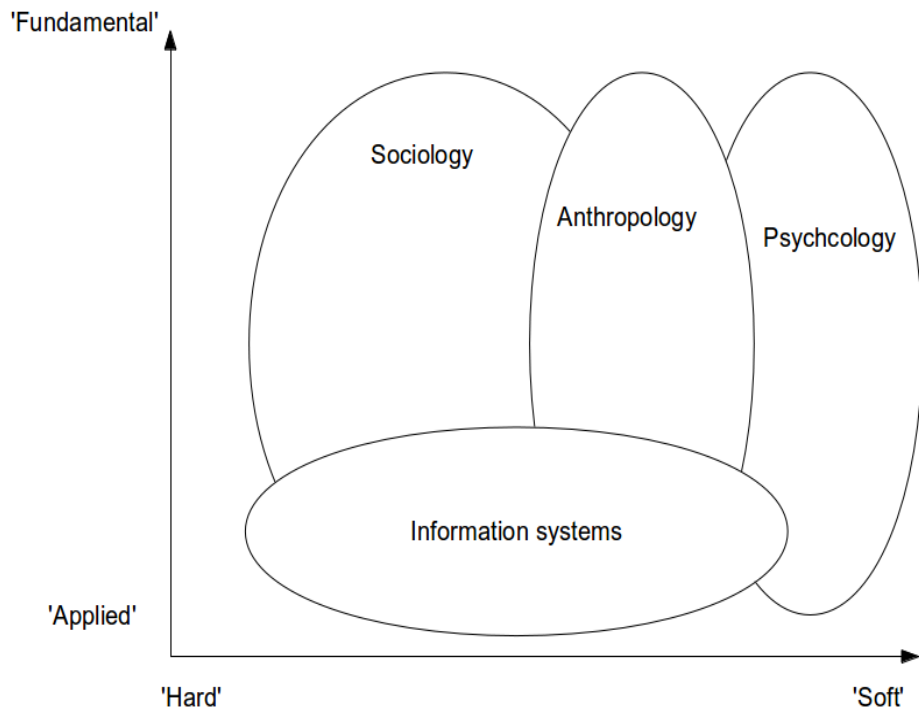
Figure 2.10: Differentiation of IS from other social science disciplines
Source: Avison and Pries-Heje (2006:190)

2.5 Generation of theory

Researchers have to be explicit about their definition of theory, its role and how it is viewed by the researcher (Gregor, 2006; Holmström, 2005). There is certainly merit in this view, given the fragmented nature of theory's application within IS as discussed above. "... simply stated, theory guides the process of making sense of complicated and often contradictory real-world phenomena." (Truex, Holmström & Keil, 2006:800). Theory serves two functions within this research project. Firstly, it serves as a lens through which to *contextualise a phenomena.* The underlying characteristics of the theory are used to assist in explaining the observed case. Secondly, the object of the research *is to produce theory.*

In the same manner the theory produced should serve as a lens to view the phenomena in a clearer way. Popper as quoted in Gregor (2006) described theory as:

> "Scientific theories are universal statements. Like all linguistic representations, they are systems of signs or symbols. Theories are nets cast to catch what we call "the world"; to rationalize, to explain and to master it. We endeavour to make the mesh even finer and finer." (Gregor, 2006:615)

Holmström (2005) calls researchers to stay close to the core of the theory in development into the future and says that this is a key challenge to the application of social theory. According to Walsham (2005), the selected theory influences the nature of the study. IS challenges theory development in two ways (Olbrich, Muller & Niederman, 2011):

- Complex socio-technical nature of the environment;
- The constant cycle of innovation introduces change.

This causes IS research to creatively draw from theories at different levels of abstraction (Avgerou, 2013).

Olbrich, Muller and Niederman (2011) call for an approach where, rather than fitting the IS phenomenon into the various paradigms, that conceptual ideas of theory are used as a base. As was shown in the section on the history of IS research, these elements have a direct bearing on the approach taken towards theory development. IS seeks to document non-deterministic patterns within integrated and complex socio-technology environments. The technical and social however is not always easily separable.

> "Academic research is trying to follow a model like that taught in medical schools.

Scientists are translating data into theories and promising to develop prescriptions from the theories. Data are like symptoms, theories like diagnoses and prescriptions like treatments. Are not organizations dynamic as human bodies and similarly complex? Theories do not capture all the information in data and they do not determine prescriptions uniquely. Perhaps scientists could establish stronger links between data and prescriptions if they did not introduce theories between them. Indeed, should not data be results of prescriptions? Should not theories come from observing relations between prescriptions and subsequent data?" (Starbuck in Sutton & Staw, 1995:387)

To this call, Walsham (1995a) adds:

"... there is a danger of the researcher only seeing what the theory suggests and thus using the theory in a rigid way, which stifles potential new issues and avenues of exploration. It is desirable in interpretive studies to preserve a considerable degree of openness to the field data and a willingness to modify initial assumptions and theories." (Walsham, 1995a:76)

Theory development is a process and especially in IS the process could involve multiple methodological stages. Ultimately IS theory draws on the theoretical perspectives that "… provide ontological and epistemological assumptions regarding human action and the relationship between technology and society." (Avgerou, 2013:402).

Theory has three main components (Levy & Ellis, 2006):

- Certain propositions supported by defined constructs (or concepts);

- The relationship between the constructs is presented through a presentation of a systematic view;

- An explanation is made of the phenomenon in order to assist with predictions.

In conclusion, consider the points made by Sutton and Staw (1995) on specific aspects that are not classified as theory. Sutton and Staw (1995) state:

- References are not theory. Referring to other theories lays the foundation for the proposed theory but is not theory itself;

- Data is not theory. "The data does not generate theory - only researchers do that";

- Lists of variables or constructs are not theory;

- Diagrams are not theory;

- Hypotheses are not theory.

Taking these statements into consideration the next section provides an overview of the research approach followed.

2.6 Research approach

Benbasat and Zmud (1999) highlight the importance of relevance and specifically list the following guidelines for guiding research towards relevance:

- Topic selection: *Focus on the future interest of stakeholders*, identify topics from IS practice and draw on academic issues that influences practice in the future.

- Purpose: Focus on a *likely outcome* rather than purely academic or intellectual issues. Provide *context-rich research*, develop frames to organise and provided guidelines for managerial action. Present the research output in a format that is useable for decision-making.

A high emphasis is placed on relevance within this thesis. The ability to apply generated knowledge constructively adds to the conceptual value a theory offers. A deliberate attempt is made to provide a rich context for the case environment and to ground the framework within a specific industry context (discussed in Chapter 8).

Remenyi, Williams, Money and Schwartz (1998) describe the research process as consisting of eight phases, namely:

- Reviewing the literature;

- Formalising a research question;

- Establishing the methodology;

- Collecting evidence;

- Analysing the evidence;

- Developing conclusions;

- Understanding the limitations of the research;

- Producing management guidelines or recommendations.

According to Hussey and Hussey (1997), there are six fundamental stages in the research process, namely:

- The identification of the research topic;

- Definition of the research problem;

- Determine how the research is going to be conducted;

- Collection of the research data;

- Analysis and interpretation of the research data;

- Writing up the dissertation or thesis.

Combining these two perspectives, this research approach follows the following structure as presented in Figure 2.11 with the relevant parts of the thesis indicated where these aspects are addressed.
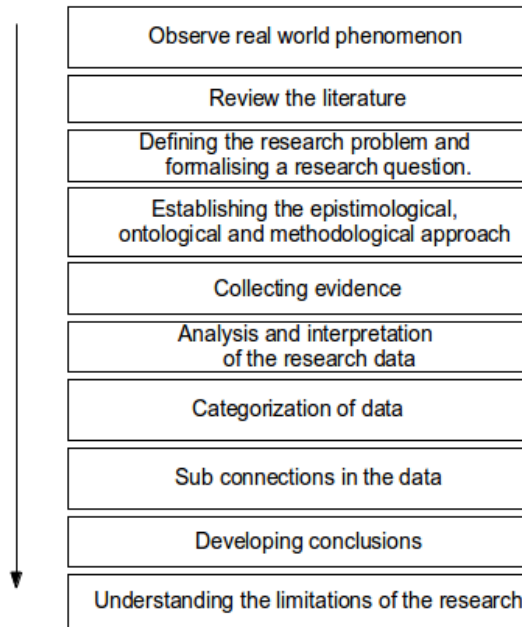
Figure 2.11: Typical research roadmap
Source: Adapted from Hussey and Hussey (1997) and Remenyi et al. (2002)

These steps can be mapped to the research process followed in this study as follows:

- Observe real world phenomenon: Markets and the use of technology within markets.

- Review of literature: This is done in chapters 4,5,6

- Defining the research problem and formalising the research question: This has been achieved in

chapter 1

- Collecting evidence and the interpretation of data: Chapter 10

- Developing conclusions: Chapter 11

- Understanding the limitation of the research: The evaluation is discussed in chapter 12

Figure 2.12 illustrates the research options and methodological implications confronting a research approach. It has been established that within the research context, the research philosophy is distinctly interpretivist, the approach inductive utilising a case study and employing semi-structured qualitative interviews as the data collection method. These aspects are discussed next.

2.6.1 Case study

Qualitative case studies are an accepted method for research into information systems and are widely adopted (Avgerou 2013, Avison & Pries-Heje, 2005, Darke, Shanks, & Broadbent, 1998). Case studies typically addresses research question relating to "how" and "why" within unexplored research fields well (Eisenhardt & Graebner, 2007). A case study is defined as "... a systematic inquiry into an event or a set of related events, which aims to describe and explain the phenomenon of interest" (Bromley, 1990:4).
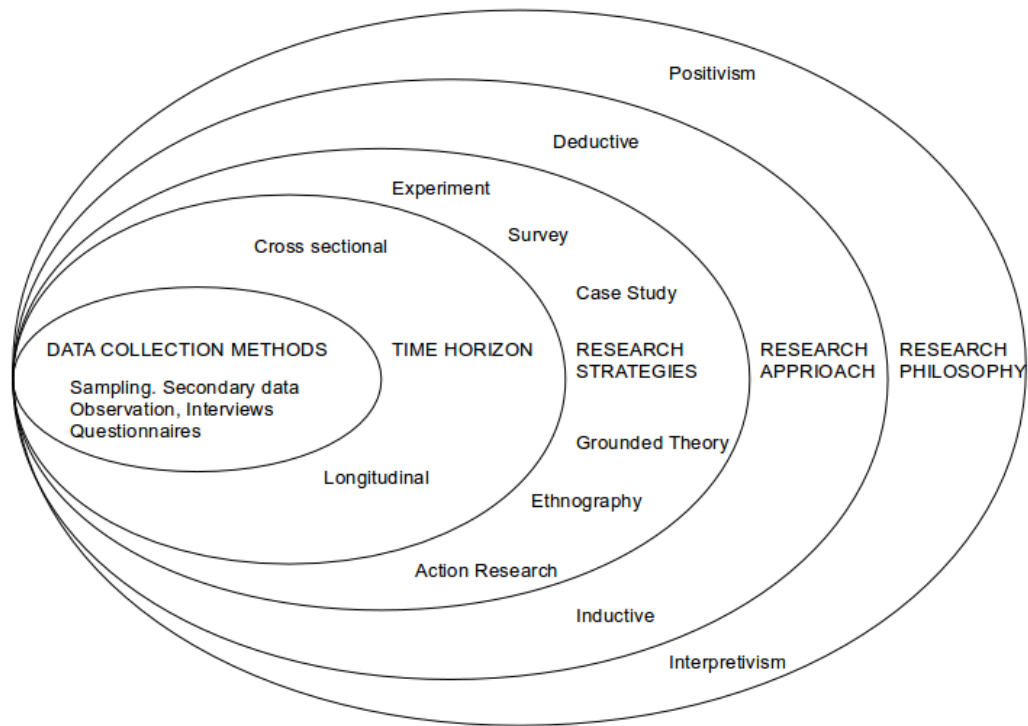
Figure 2.12: The research onion
Source: Saunders, Lewis and Thornhill (2003:83)

There have been a number of seminal single case studies within information systems over the years as illustrated by the work of Benbasat, Goldstein and Mead (1987), Markus and Pfeffer (1983) and Myers (1994). Walsham (1995a) sees the case study as the most suitable form for conducting interpretive research, an approach that "... are capable of achieving the same scientific objectives through different means." (Lee, 1989:41). According to Walsham (1995a), single case studies allow for an in-depth investigation of a phenomena and for a rich description and understanding of it. Case studies are best suited for environments that contain "... more variables of interest than data points ..." (Recker, 2013:26).

> "To be most valuable, we believe a conceptualization of trust constructs should be cross-disciplinary in nature. By creating a cross-disciplinary set of trust concepts, work by researchers in one field could be compared to work in other fields. In this way, researchers will make cumulative progress on trust." (McKnight & Chervany, 1996:5)

The specific approach used is influenced by the type of questions, the audience of the research and the resources available (Taylor-Powell & Renner, 2003). The study relies heavily on qualitative research

methods due to the socio-technical nature of trust. Ashleigh and Meyer (2012:138) argue for "integrative and inductive approaches to trust". Qualitative research methods used involve the gathering of data from the broader social context (individuals, their lives and environments). Qualitative methods comprise personal experience, interviews, case studies, texts and observations. It is used to extract the stories, meanings, relationships and other more subjective elements from the case environment. Subjectivity is ever present as the researcher is positioned between and interacts with the interdependent meaning of the parts and the whole as part of the hermeneutic circle (Cardoso & Ramos, 2012). This subjectivity is important to monitor and the framework of Klein and Myers (1999) is used, among other frameworks, as part of the reflection on subjectivity within Chapter 12.

The chosen approach is appropriate given the nature of the research topic being a potentially highly social environment in which one is reliant on the observations of individuals to provide meaningful data. In addition to the above, the case environment (namely fresh produce markets) is complex and requires a broader approach to allow for a more descriptive view of the market as an institution and this further justifies the use of qualitative data techniques.

The following sources produced data for analysis:

- Interview questions: from structured or open-ended responses, provide various levels of depth of information. The interview also produces notes and summaries of the topics raised. Interviews could raise additional viewpoints that might not have been anticipated prior to the interview.

- Documents, journals and diaries: Internal sources can provide specific supporting text or could provide descriptive elements of the case environment.

- Observations: Through observing and listening, various notes are made about the market environment.

- Media: Documents, reports, video, audio, news articles and any published material produces data.

The case study includes a combination of the above data sources, which could potentially make a clear distinction between data gathering and analysis problematic in qualitative research (Avison & Pries-Heje, 2005). Interpretation of the data only occurs after the evaluation of the literature and after the processing of the interviews via the ATLAS.ti tool. This removes some of the subjectivity as the interpretation of the analysis is grounded in the data and literature. The next section discusses interviews as a data collection method.

2.7 Data collection method - interviews

Interviews are "... real-time conversations between a researcher and the respondent to discover the respondent's personal views." (Mingers, 2003:238). Interviews, as a method of data collection, are popular but they have a variety of approaches (DiCicco-Bloom & Crabtree, 2006). Empirical data sources has the potential to demonstrate the "… underlying empirical support and the anticipated richness of the case data" (Eisenhardt and Graebner, 2007:29). The specific approach is guided by the context of both the interviewee as well as the nature of the research topic.

Interviews, according to Baily (1978) have the following advantages and disadvantages:

Advantages:

- Flexibility: Interviews allow for probing and delving deeper into points. It also allows additional concepts to emerge as the responses reflect perhaps a particular field of experience. Interviews also allow for the correction of a point if the person misunderstood a particular point.

- Response rate: The quality of the responses is potentially of higher quality because participants have the opportunity to talk rather than write. Writing could limit the extent to which they can elaborate on a particular point. There is also less pressure on the individual who struggles with writing and expressing their thoughts.

- Nonverbal behaviour: Nonverbal reactions and attitudes could also be observed.

- Control over environment: The conditions within which the interview is held could affect the quality of the interview. Excessive noise or other distractions can be controlled.

- Question order: Control of the question order allows the interviewer to ask questions and fit this into the chain of thought of the interviewee.

- Spontaneity: Spontaneous reactions are lost in questionnaires. These reactions could provide clues to underlying perceptions surrounding a particular issue. Experiencing any misunderstandings is also important to judge the relevance or clarity of the actual questions. In a questionnaire, these signals will be lost.

- Respondent alone can answer: The researches are assured that the response is that of the interviewee itself.

- Time of interviewee: The exact time and date can be recorded and chronologically placed in

context.

- Completeness: The interviewer can return to questions and ensure that all questions are answered.

Disadvantages:

- Cost: Interviews can be very costly, especially if it involves a significant amount of travelling.

- Time: Apart from the physical time, it takes to conduct the interview, travelling and preparation for the interview could be very long.

- Interview bias: The interviewer can ensure that the questions are understood and answered within a particular context. However, the interviewer may also misunderstand the answer provided or fail to recognise that the interviewee does not understand the particular question. Apart from this, the actual personal interaction might also have an impact whereas the race, class, sex, age and physical appearances might affect the atmosphere of the interview.

- Consultation of records: The interviewee does not have the opportunity to research and consult material during the interview.

- Inconvenience: Fatigue, stress, illness and temperature of the environment are personal aspects that can affect both the interviewer and the interviewee.

- Less anonymity: The interview offers very little anonymity as the answers are provided directly to the interviewer. The setting up of the interviews and visiting the premises of the interviewee could affect the willingness of the individual to allow the interviewer access.

- Less standardised question wording: Probing, rephrasing and adjusting question to suite the particular interviewee might all affect the answers and the comparison of results between different respondents.

- Accessibility: To get access to the right people poses a challenge. Unwillingness to participate or not being able to fit an interview into a schedule could lead to some interviewees being omitted.

Semi-structured interviews were used as part of the interview process. Using more semi-structured interviews proved suitable, as the topics within the interviews required some broader clarification in some instances. A more open approach also allows for the identification of new or unanticipated themes to emerge. Interviews present a situation where the meaning of the subject under discussion is interrogated through the eyes of the interviewee and the researcher must be aware of this subjectivity.

The experience during the interviews was that the interaction between the interviewee and the interviewer was very responsive and one could guide and adapt the questioning as the discussion unfolds. The ability to adapt the interview was paramount. Certain interviewees had different perspectives of their environment and this would reflect in their understanding of the questions.

Scoping the research was guided by the research question. The focus falls on an industry and specifically on the workings of an institutional market environment. Within this environment, key individuals were identified for interviews that could provide insight into the institutional nature of markets. In addition, materials in the form of documents and other related text were sourced. Determining whom to interview, gaining access to and permission to interview are major hurdles that had to be overcome. Effort was made throughout to focus on senior management of the various organisations. Once the interviewee was identified, a series of pre-interview conversations occurred starting with the introduction letter from the university. This was followed up by a telephonic contact in which further clarifying aspects were communicated.

Two test interviews were performed and proved to be very important benchmark for the structure of the interviews. Although there were no major adjustments required, the main issue emerging from these pre-interviews were the importance of understanding the interviewee's specific work environment and job function. Individuals would interpret the questions from their own personal work perspective and during interviews; these aspects had to be taken into account.

A set of guideline questions were used to structure the interview, but the interviewee had the freedom to provide additional insight and interpretations of the questions and issues as it were raised. Contextual insights from the interviewee provide a broader perspective that gives further dimensions to the topic. An important aspect of the interview situation was the "connection" one has to make with the interviewee. This connection requires one to have an open and spontaneous interviewee. Trust needs to be established with the interviewee either before or during the interview.

DiCicco-Bloom and Crabtree (2006) list the following ethical considerations when conducting interviews:

- Reducing the risk of unanticipated harm;
- Protecting the interviewee's information;
- Effectively informing interviewees about the nature of the study and
- Reducing the risk of exploitation.

In all the above cases, confidentiality and open honest communication were used that avoided any misperceptions. Pre-interview communication included a summary of the intention of the interview and background to the study. Within the study, no reference is made to the actual organisation, there will only be referred to as Company 1, 2, etc.

Data was processed using Atlas.ti tool. The ability to assign code and add labels within the text/phrases assists the researcher to unpack the various issues raised. Atlas.ti provide various tools to interpret and map these terms provides a structured approach to working with the data. The data collected consisted out of large amounts of text and the ability of Atlas.ti to structure these according to labels, mapping these out with co-concurrence as an example assisted with the identification of known and unknown concepts.

2.8 Concluding summary

In this chapter, the research approach and design were discussed. The study follows a distinct interpretivist approach using a qualitative case study and employing semi-structured interviews to collect data.

This chapter provides background to the various issues challenging IS research as a discipline and the author's view on the underlying philosophy guiding the research. Research into IS has to acknowledge this as part of constant self-reflection as it affects the legitimacy of the research results. A discussion surrounding the selected interpretivist approach argues for the inclusion of concepts from the broader case environment to form part of the research process. The philosophical grounding of the research project guides the researcher in selecting the appropriate methods and tools used to conduct research.

An interpretivist approach characterises this research project and this choice of qualitative methods are argued as appropriate. Using an interpretive approach allows for the inclusion of multiple forms of qualitative data sources. The research utilises a qualitative case study, which is seen as a recognised form of research approach. The results of the case study is discussed in Chapter 10.

The following chapter discusses the approach to the literature review and its role in this study.

Part 1: Background

CHAPTER 3: APPROACH TO THE LITERATURE REVIEW

CHAPTER ROADMAP

PART 1 - INTRODUCTION

Chapter 1	Introduction
Chapter 2	Research Methodology

PART 2 – LITERATURE REVIEW

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PART 3 – CASE ENVIRONMENT

Chapter 8	South Africa's Fresh Produce Markets
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CHAPTER 3: APPROACH TO THE LITERATURE REVIEW

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"Human history is created by intentional activities but is not an intended project"

(Giddens 1986:27)

3.1 Introduction

Literature plays a central role in research as it contextualises the various issues through the experience and input of other authors (Ellis & Levy, 2008). Literature highlights the priorities and agendas that are seen as relevant and provides theories, models and arguments informing the research processes. IS scholars need to pay more attention to the structure of a literature review (Okoli & Schabram, 2010). A literature review creates a credible base with which to interpret and present findings. Levy and Ellis (2006) call for a structured approach to literature reviews in IS. Something that they claim is lacking. A structured approach assists the scope and improves the rigour of the study (Okoli & Schabram, 2010).

This chapter provide a background to how the literature review was conducted, its scope and the various aspects that was taken into account. The literature review is employed as part of the various stages of the research journey, from theory evaluation, the review of key concepts, approaches towards empirical methods and ultimately evaluation of the contribution of a study. All aspects of a study should be informed by literature in some way. The following section introduces the definition of a literature review.

3.2 Definition of a literature review

Conducting the literature review is a deliberate attempt by a researcher to provide an academic base for the various processes of a research study. The literature review does not only focus on aspects relating to a specific theory as part of theory building, but also includes areas like philosophical, methodological, procedural and also empirical phases of a research project.

Okoli and Schabram (2010) define the literature review as follows:

> "... a systematic, explicit and reproducible method for identifying, evaluating and synthesizing the existing body of completed and recorded work produced by researchers, scholars and practitioners." (Okoli & Schabram, 2010:1)

Levy and Ellis (2006) define the literature review as:

> "... sequential steps to collect, know, comprehend, apply, analyse, synthesize and evaluate quality literature in order to provide a firm foundation to a topic and research method." (Levy & Ellis, 2006:1)

It needs to be:

> "... systematic in following a methodological approach, explicit in explaining the procedures by which it was conducted, comprehensive in its scope of including all relevant material and hence reproducible by others who would follow the same approach in reviewing the topic." (Okoli & Schabram, 2010:1)

Okoli and Schabram (2010) propose the following as part of planning the literature review:

- Methodological approach: Systemic;
- Explicit about procedures: How was it conducted?
- Comprehensive: What was the scope?
- Reproducible by others.

Okoli and Schabram (2010:3) further make the point that literature review is also open to subjectivity and should be approached with the same "conscious objectivity" as one would approach other aspects of the research journey.

> "An effective and quality literature review is one that is based upon a *concept-centric* approach rather than chronological or author-centric approach." (Levy & Ellis, 2006:4, *own emphasis*)

Given the above, the approach as illustrated in Figure 3.14 has been followed within this thesis. Firstly, the framework as presented by Okoli and Schabram (2010) served as a guide for the sourcing and selection of literature. Although the focus within the Okoli and Schabram (2010) papers falls on the more formal Systematic Literature Review, their framework offers a systematic process that guided the literature review. Throughout the review, the topic guides all the decisions and approaches taken.

The literature review acts as a key aspect in formulating the research context. Another important aspect of the literature study is to provide a certain level of reproducibility. By doing this, the researcher adds value to the community by allowing others to build onto this study. The literature study positions the research within the context of the current state of the body of knowledge and against the potential gaps that exist in the literature. The literature review does not only support the topic in this manner but also supports the methodological and theoretical structures on which theory is built. This forms the grounding for the discussion and development of theory. Figure 3.13 provides some metaphors for the forms a

literature review can take. Apart from acting as a lens for the view of phenomena, this also illustrates the constant adjustment required as indicated in the concertina example.
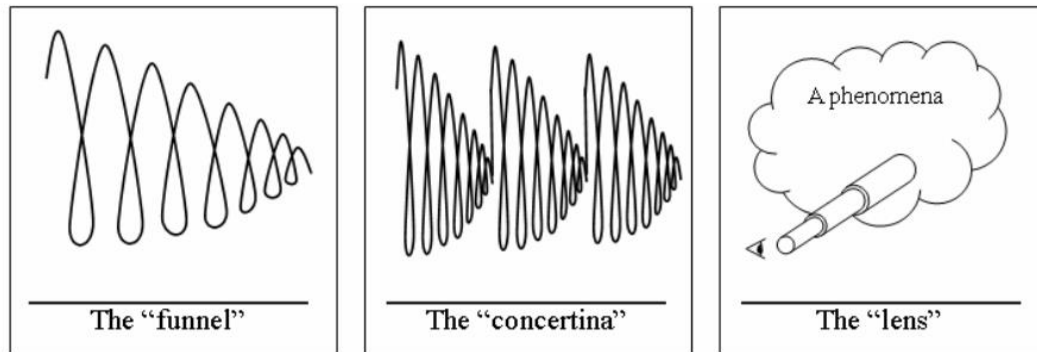
Figure 3.13: Key metaphors for a literature review
Source: Levy and Ellis (2006:192)

The literature review is not a linear process. A review of the literature can span a significant amount of time and could lead to various new themes and directions being uncovered. This might require one to revisit previous searches. The aim of the literature review was to identify themes, approaches and concepts that can contribute to our understanding of the topic of trust and self-service technology.

The following section elaborates on the framework used for this literature study an also provides insight into the process.

3.3 Framework for the review

Although intended for a structured literature review, the framework of Okoli and Schabram (2010) provides a structure to approach the review. Figure 3.14 summarises the approach and divides the process into four distinct areas. Firstly, the planning phase sets out the key assumptions and boundaries of the literature review. Secondly, the selection phase involves the selection of sources and the material. Within the selection phase, the various keyword and selection criteria are determined. Thirdly, the extraction phase is the selection and categorisation of the literature. Lastly, the execution involves the analysis and structuring of the key elements found in the literature.

The process is not a sequential and linear one. Between the selection and extraction phases, various adjustments are made as new themes and issues emerge as relevant and supportive. This involves adding a search theme to the original themes and then extending the search into that direction.
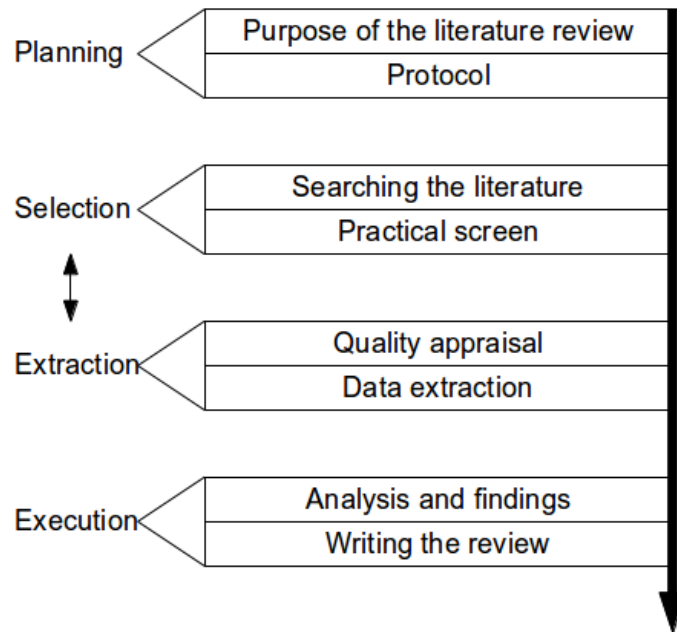
Figure 3.14: A systematic guide to a literature review
Source: Adapted from Okoli and Schabram (2010)

For the purposes of this discussion, we will focus on the planning and selection stages as the intention is not to replicate a systematic literature review as intended by Okoli and Schabram (2010).

3.4 Purpose of the review

The planning of the literature review involves clarifying the purpose of the review, specific scope and the protocols employed. The purpose of the review is discussed in the following section but are ultimately driven by the requirements set by the main research question.

The protocol describes the plan of the literature review (Okoli & Schabram, 2010). The protocol is guided by the research question and it involves the methodology and steps to be followed to conduct the literature review. Planning involves the need to be clear on issues relating to ethics, use of contextual tools to process, keep track of the literature review process and the approach relating to the search of the literature. Ethical behaviour is defined as "being in accordance with rules or standards for right conduct or practice" and "unethical behaviour constitutes a violation of such conduct or practice." (Laband & Piette in Levy & Ellis, 2006). Ethical behaviour in context of the literature review involves paying careful attention to the

correct citation of sources avoiding plagiarism. The purpose needs to be explicitly stated before the time to contextualise the various viewpoints surrounding the topic.

The purpose of this review is to:

- Identify relevant literature relating to the key elements of the study (trust, self-service and the relevant industry background),
- Identify sub-themes from the literature.
- Identify models used relevant to the theme of the research topic.

3.4.1 Selection of Keywords

A keyword search involves the querying of scholarly databases using specific words or phrases (Levy & Ellis, 2006). The risk of keywords is that their meaning and context might change as the research process evolves. New concepts might emerge that requires one to revisit previous searches. Table 3.1 lists the main themes with the subsequent keywords used.

Table 3.1: Keywords used

Dimensions	Keywords
Trust	Trust*; institutional trust; inter-organisational; governance; contracts; risk; failure; power; information
Self-service	Self-service; service; intermediation; self-service technology; technology
Fresh produce industry	Fresh produce; fruit market/s; vegetable market/s; wholesale market/s; supply chain; value chain; buyer supplier; producer; farmer; grower; coopetition; market/s; electronic exchange; e-market; agent; e-procurement; auctions; transaction costs; history of markets; price discovery; retailers; supermarkets
Theory	Structuration theory; interpretive research; case study; case study research

3.4.2 Source strategy

Peer reviewed journals should form the core of the literature study (Levy & Ellis, 2006). Journal archives and open access databases are used as the main source of literature search. An attempt was made to search as broad as possible initially through sources that contain IS research publications (i.e. journals, quality

conference proceedings, etc.) (Levy & Ellis, 2006). Sites, which map and list important IS journals are a good source to assist in the selection of journals (http://aisnet.org is an example of such a site). To avoid "link rot" the internet references were reviewed during May 2015 to ensure availability.

The major source used for searching was via the University of Pretoria's library electronic journal facility. Academic journals were used to ensure that credible sources inform this study. The use of non-academic sources was kept at a minimum and was only used for broader context purposes.

The search strategy firstly involves identifying the various literature sources. The criteria, which is to be used for the selection and classification of the material is also determined. The literature search was conducted using the journal archive facilities of the library as well as the SABINET facility. A selection process was continuously conducted; excluding articles deemed not relevant (Okoli & Schabram, 2010). Additional searches were conducted through SABINET with the assistance of the library personnel. Within the search facility databases such as Google Scholar and the Directory of Open Access Journals, ProQuest, JSTORE, Emerald Insights, Science Direct, EBSCO Host, IEEE Xplore and the ACM Digital Library were among the most consulted. Specific issues relating to industry matters were conducted through a search engine search (Google.com). In many instances, this lead back to references for articles from specific journals, which lead to a journal search for that specific journal.

3.4.3 Search phase

3.4.3.1 Scope

The review involves both a thematic scope and a source/time period scope. From a thematic perspective, the various related themes and sub-themes all relate back to the original issue at hand. The issue of publication time-demarcations are not enforced in a strict manner. This is because the limitation and pre-mature demarcation of publication dates could lead to the exclusion of relevant material. The historical perspectives on aspects such as trust not only provides context but also assist in positioning the various concepts. Trust research has a long-standing history and older material provides the grounds for current discussions. The focus in the literature study was to identify the main drivers and dynamic components that are present in trust formation on an individual and inter-organisational level to create a backdrop for the proposed progressive argument.

Levy and Ellis 2006, suggest two risks to the literature review:

- Very narrow literature background (horizontal): By using the various major databases, the search was not limited to one single vendor. Open searches on these databases also produced cross journal searches. Thus, one would have returned journals that are from all areas of the academic spectrum. A deliberate effort was made to expand the search across different search facilities.

- Shallow depth of literature background (vertical): A combination of cross-reference to older articles and not placing any limitations on the periods searched, meant that potential sources were identified from a broad set of results. By not limiting the search to either a specific journal or repository allowed the search results to return a broad set of potentially relevant material.

3.4.4 Processing of material

3.4.4.1 Use of contextual tools

Contextual tools are used to assist the author in managing what was read over an extended period. Through the reading process, the various key themes were noted into a directory listing (Figure 3.15) and entered in the FreeMind (Figure 3.16) tool where additional notes were made. To ensure continuity, these tools served as the reference point of processing literature. These tools are extremely helpful in not only categorizing material but also to identify both authors and themes as part of the literature search.

Throughout the process a list of journal articles were maintained. Material was categorised under specific themes. This ensured continuity and avoided duplication. Over the course of the study, various tools were used with different results:

- Management system - ZOTERO: initial storing of material;

- Keywords – MINDMAP – FreeMind: conceptual ideas and mapping of relationships;

- Journal list – Access Database: custom database that allows for the searching and categorising of material;

- Reference list: A reference list was maintained throughout the process.
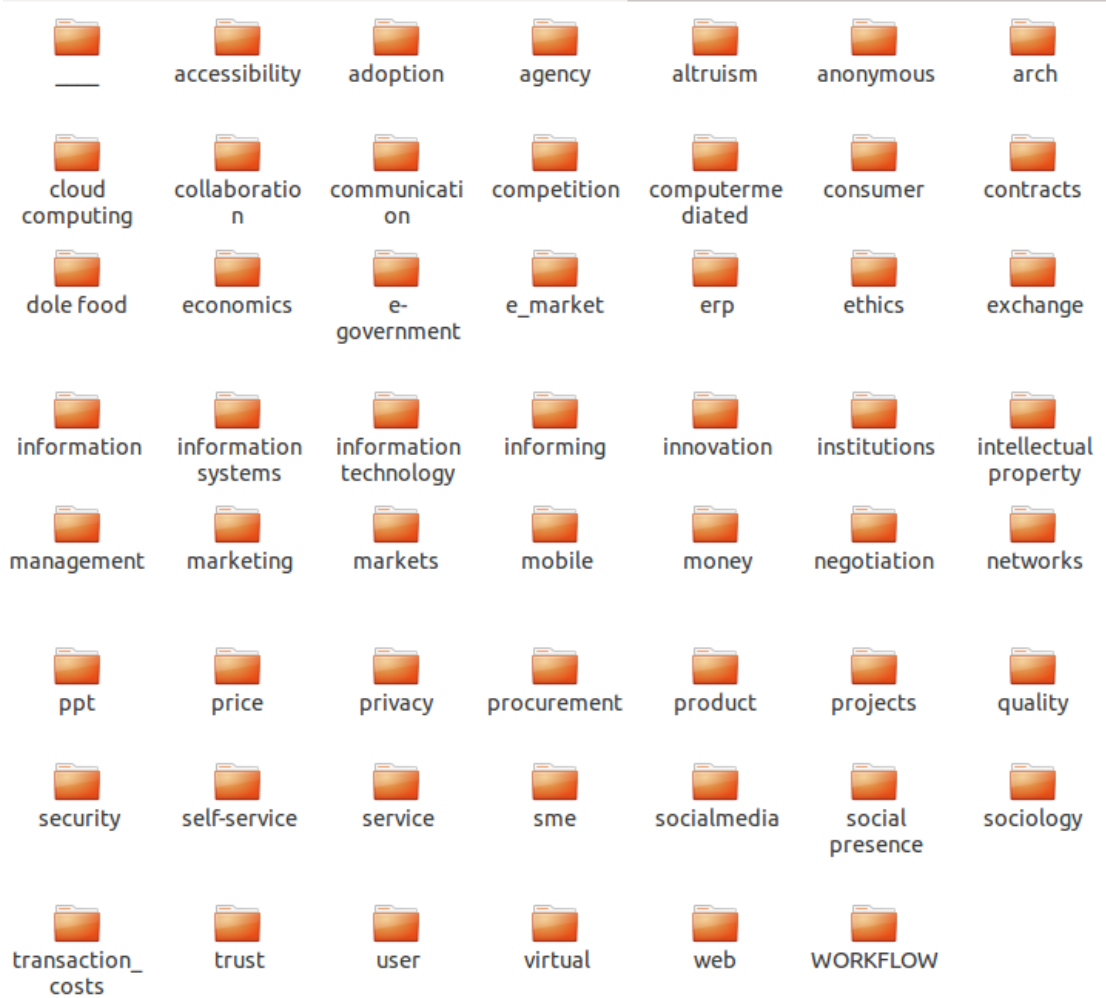
Figure 3.15: Folders within the author's literature directory
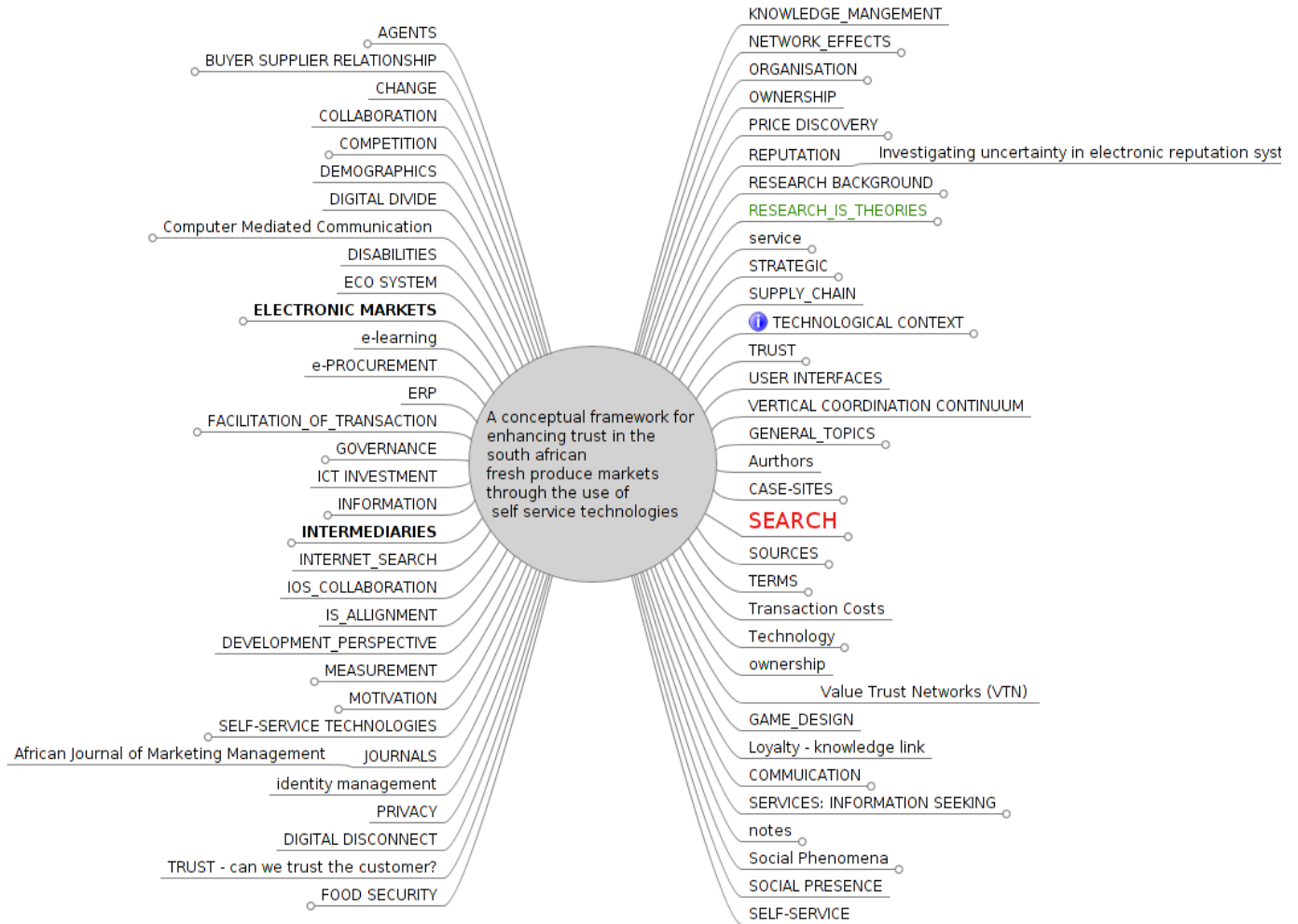
Figure 3.16: Freemind used for mapping of conceptual ideas as part of the literature study

3.4.4.2 Quality appraisal

As part of the literature review one has to make subjective decisions about the relevance of material. The inclusion/exclusion of material is guided by the subjective interpretation of the researcher on the one hand and the weight attributed to authors and themes emerging from the literature. Screening occurs after the initial material was identified. Importantly material that was not selected was noted and was in some cases re-evaluated. Quality is a subjective concept and in this study, quality is related to the relevance and the credibility of the author/s and journals. The literature review firstly focused on the use of accredited peer review journals. Published work from accredited peer reviewed journals can be used with confidence and the quality of this literature is important to strengthen the rigour of the research (Levy & Ellis, 2006). A

sign of quality work is cross-referencing, not just inside a particular journal, or authors' referencing themselves, but across journals and authors.

Initially an article is considered based on aspects such as the title, keywords, abstract and introduction. The second screening is the relevance of the article contents. The following criteria is used:

- Content: relevance to the study (Dawson & Ferdig, 2006);

- Publication language: Study limited to articles in Afrikaans and English;

- Journals: Focus is placed on accredited journals and journals focusing on related fields of study;

- Authors: Key authors emerged through the literature study and special attention was made to search for other works by these authors;

- Setting: No particular restrictions were placed on the specific commercial setting of articles.

However, industries such as the air travel and health care industries offer valuable insights as they have experienced a significant amount of research relating to technology. These industries are also at the forefront of innovation and offers rich context for similar implementations.

3.4.5   Time/Age

Relevant research involves using the latest viewpoints and arguments within a specific field. One has to aim at using the latest work. The main literature review was conducted between July 2013 and July 2014 after which the empirical phase of the thesis followed. Additional sources were consulted, as themes or further background was required. A theme such as structuration, which has a long academic history, has seminal pieces of work that encapsulate the core of the theory in this case. Including such older work would be suitable. Under the IS research field the articles of Orlikowski and Baroudi (1991) and Walsham (1995a) are examples of seminal articles that are relevant and still cited regularly. Figure 3.17 provides a summary of publication dates of articles that were consulted (directly and indirectly).

3.4.6   When does the process stop?

The literature review is not a once off exercise and is part of the continuous process as the research project matures. Once one reaches the point where repetitions of the same concepts emerge, it could indicate a saturation level for that particular search (Levy & Ellis, 2006). One can also be affected *by literature fatigue.* Access to sources can be over whelming with hundreds of results being returned with every search.

The decision to terminate the bulk of the search is a subjective one guided by a combination of the issues above. Refer back to Figure 3.13 to the various options within the search strategy. The best way to describe the literature search in this instance is the concertina approach: There is a constant flow of information and correction as the sub-topics emerges and the literature introduces new authors.

3.4.7   Literature

Table 3.2 provides an overview of the primary and secondary sources consulted as well as the type of material and the sources of the material. Books and reports consist out of published books as well as reports from various industry bodies. Journal articles were sourced through the University of Pretoria's electronic journal facility. The major journals that were consulted are listed in Table 3.3. It lists the quantity of articles that were consulted from those publications during the course of the study (Table 3.3 lists only titles where more 5 or more articles were consulted, the balance is indicated as "other"). A further view by publication date of the literature consulted is contained within Figure 3.17.

Table 3.2: Classification of source material according to type

TYPE	QTY
PUBLISHED BOOKS/ REPORTS	127
ACADEMIC JOURNALS	713
GENERAL MEDIA	35

Table 3.3: Major Journals consulted

JOURNAL TITLE	QTY
MIS Quarterly	42
Journal of Services Marketing	23
Journal of the Association for Information Systems	15
International Journal of Service Industry Management	15
Journal of Service Research	15
Journal of Marketing	14
Harvard Business Review	13
Journal of the Academy of Marketing Science	12
Communications of the ACM	11
Information Systems Journal	11
Managing Service Quality	10
European Journal of Information Systems	10
American Sociological Review	9
Information Systems Research	9

Decision Support Systems	8
Journal of Information Technology	8
The Electronic Journal of Business Research Methods	8
International Journal of Electronic Commerce	8
Administrative Science Quarterly	8
Journal of Business Research	7
Academy of Management Review	7
Informing Science Journal	7
Organization Science	7
The Academy of Management Review	6
The Service Industries Journal	6
Journal of Computer-Mediated Communication	6
Review of Agricultural Economics	5
Sprouts: Working Papers on Information Systems	5
Services Marketing Quarterly	5
International Journal of Bank Marketing	5
Journal of Service Management	5
Journal of Retailing	5
European Journal of Marketing	5
Organization Studies	5
Other titles	540
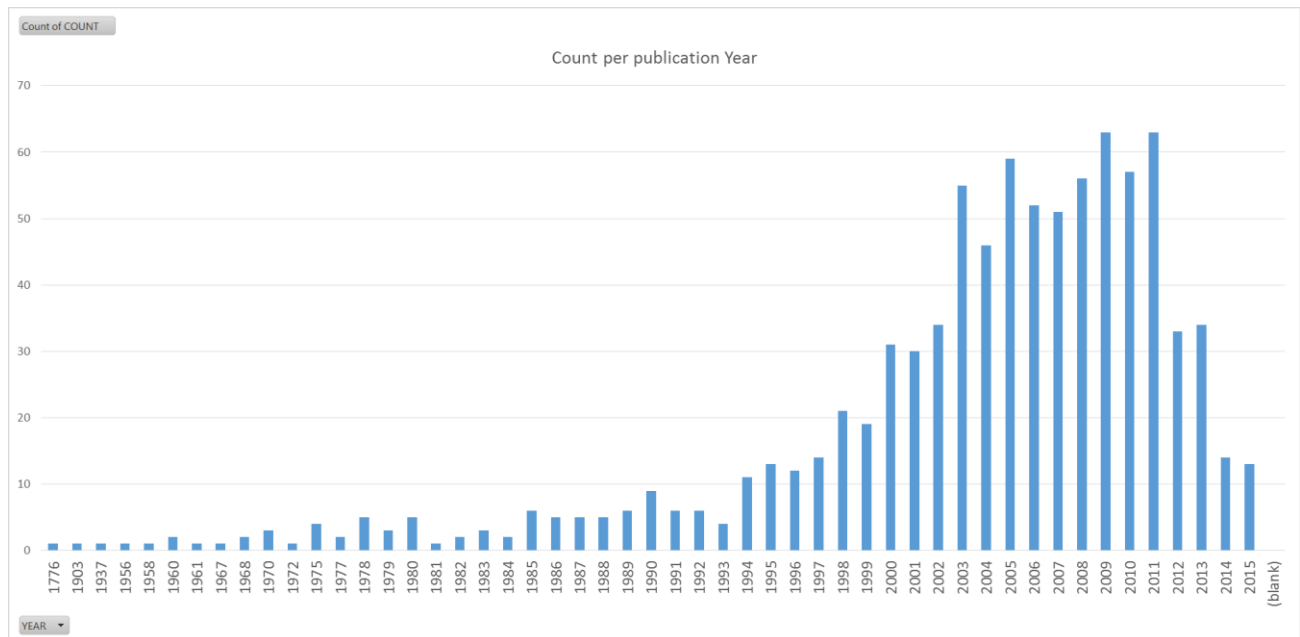
Figure 3.17: Publication dates of literature consulted

3.5 Literature review: Chapters 4 - 7

The three main concepts underlying this study are presented under chapters 4 to 7. These chapters focus specifically on the emerging themes from the literature review as discussed earlier in this chapter.

Chapter 4 introduces the theory of structuration and unpacks the various aspects that characterise the theory. Giddens' work was used as the core of the review. ST has been used within technology contexts and these sources were incorporated for that reason. ST also received criticism as a theory in general specifically relating to its use in research.

Chapter 5 focusses on trust. A substantive amount of literature exists on trust covering virtually all academic domains. Changes in technology and specifically the large-scale use of technology in services challenge our understanding on common perceptions surrounding trust. Various authors' theories relating to trust within the technology environment were consulted to identify theoretical and emerging themes.

Chapter 6 focusses on the institutional environment and the forces that play a broader structuring role within institutions. Governance emerged as an important aspect affecting the functioning of participants within institutional environments.

Chapter 7 introduces the literature related to the empirical side of the study focusing on broader international food spot markets.

3.6 Concluding summary

This chapter sets out the approach followed as part of the literature review. A well formulated plan ensures that the literature review provides a literature base in which the various methodological and theoretical assumptions are grounded. The literature review for this thesis proved to be a mixture of experiences. Some aspects of the literature yielded rich results. Themes such as trust have received significant amounts of research. Self-service is a relatively new academic theme and does not yet offer the same amount of empirical studies covering all aspects of it. Fresh produce markets on the other hand, have received very little research. The availability of literature influences the approach that is to be followed. The lack of literature on the South African spot market environment was complimented by material sourced from other similar industries. A literature review absorbs a significant amount of time and has the potential to affect the course and duration of a study. It is also a challenge to retain continuity and for that reason, the

use of a carefully structured recording and filing system is of vital importance. A structured literature review also contributes to the repeatability of a research study. The provision of an extensive reference listing assists fellow researchers in providing context surrounding literature that informed the research approach and results.

The next chapter introduces structuration theory and its use within this study.

Part 2: Literature review

CHAPTER 4: STRUCTURATION

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Chapter 1	Introduction
Chapter 2	Research Methodology

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"Human history is created by intentional activities but is not an intended project"

(Giddens 1986:27)

4.1 Introduction

This chapter presents the structuration approach as a theoretical lens. ST is a theory that seeks to explain the social dynamics of institutions over time and space. ST's application within technology environments faces various challenges of which its exclusion of technology as part structuration. Various authors have extended structuration into a technology context most notably the work of Orlikowski. Socio-technical theories seek to explain the links between the social and technical and highlight how these links are inter-related (Sawyer & Crowston, 2004). Although structuration cannot be classified as a pure socio-technical theory, there have been studies to extend ST into technical domains, notably, the work of Orlikowski (1996, 2000), Orlikowski and Robey (1991) and DeSanctis and Poole (1994).

The subject of self-service technology and trust is socio-technical in nature. Giddens (1990) explicitly approaches the issue of trust, although not directly included as a part of ST (see chapter 5 for a discussion). Facilitating trade through technology across wider geographical spaces, increase the importance of trust (Giddens, 1990). SSTs have the ability to compliment trust-forming behaviour across space and time as it creates digital linkages that facilitate modalities and information flow between actors, fellow actors and institutions. ST has been used extensively in information systems research within socio-technical contexts.

The chapter discusses relevant aspects of ST such as structure, agency, stratification and the duality of structure. The chapter concludes an overview of how ST will be utilised in this study.

4.2 Structuration Theory

Structuration has its origins as a social theory highlighting the reciprocal interaction between knowledgeable human actors and structure that surround them (the term structure is important to define and is elaborated on later) (Indeje & Zheng, 2010).

The positioning of structure within the theory is an important aspect of structuration (Jones & Karstens, 2008). The approach followed within this study is to stay close to the intended use of structure as presented in Giddens' ST (a virtual concept). Structure is approached as a construct outside technology, not embedded in any aspect of it (Orlikowski, 2000). Technology structures are enacted as part of the recursive interaction between the actor and the technology artefact.

Structuration theory has hugely influential since its origin in the 1970s (Walsham, 2002) and Giddens is one of the most widely cited social theorists (Jones, Orlikowksi & Munir, 2004; Jones & Karstens, 2008). According to Giddens, the history of human society has been shaped by three main influences: Time, Space and Power (power expressed mainly through violence) (Giddens, 2012). Time and space are:

> "... not just environments in which human society exists, they are constitutive of forms of social organisation. The kind of societies that have emerged in human social evolution had been structured through the social organisation of time and space, the communication systems that thereby resulted and the forms of power and I'm afraid, violence that these things have made possible." (Giddens, 2012: 04:03 Hour/Min)

It is important that in the self-service context that these structuring effects do not only involve physical presence but also occur when there is no physical presence.

> "Whereas social integration refers to face-to-face reciprocities between agents who meet in circumstances of co-presence and therefore preserves a concern for praxis in situ, [social] system integration refers to reciprocities between absent agents, i.e. agents who are physically and/or temporally situated in different settings, which admits the possibility of inter-situational articulations of systemic patterns." (Cohen, 1990:46)

In Giddens' words that is:

> "… stretching of social systems across time-space, on the basis of mechanisms of social and system integration." (Giddens, 1984:377)

ST offers a dynamic view (across time and space) of how structure is formed and changed through the continuous interaction between agency and structure and between the individual and society (Jones & Karstens, 2008). ST avoids the dualism of structure and agency and proposes a duality of structure that introduces a dynamic element in the interaction between the social and the structure.

> "The process of structuration in general refers to the social processes that involve the interactions between human actors and the structural features of organizations." (Jayatilika, Klein & Lee, 2007:249)

Structuration theory is concerned with the virtual structures that emerge when humans interact through agency with physical/institutional structures in time and space (Black & Greer, 2009; Rose *et al*., 2004). Social structures, which have defined attributes such as rules and resources, interact with knowledgeable human actors who through action participate, change and challenge these social structures. The structures in turn constrain the actions of actors. This dynamic is presented as the duality of structure and forms way of thinking about social phenomenon (Jayatilika *et al.,* 2007).

> "To study structuration is to attempt to determine the conditions, which govern the continuity and dissolution of structures or types of structures. ... [and] refers abstractly to the dynamic process whereby structures come into being." (Giddens, 1977:120)

The main components of ST are social practices represented by the action of actors, knowledgeable human actors having power to accomplish societal goals, routinisation of these practices into stable routines from which actors draw the structural properties and which in turn become institutionalised properties (Brooks, 1997). Institutions and action are directly linked and is best understood as a continuous dynamic process (Barley & Tolbert, 1997). Structure is both the means and the outcome of the process of structuration.

The components of structuration are:

- Structure(s): These are the various rules (routines/norms) and resources (material/authoritative), organised as properties of social systems.

- Agency: This is the free-will actions of knowledgeable actors as they interact with structures. The actor also uses recursive monitoring to determine the next planned action.

- Structuration: This is the process of production and re-production of social systems through the duality of structure. Structuration is defined by Giddens the "… structuring of social relations across time and space, in virtue of the duality of structure." (Giddens, 1984:376)

According to Stones (2005), the challenge ST faces is its deliberately broad ontological mandate, focussing on the higher level of philosophical analysis ultimately leads to challenges for both methodology and ST's application *in situ*.

4.3 Structure within Structuration theory

Within ST the terms structure and system needs to be clearly differentiated because each takes on a specific meaning. System refers to the social system of "surface patterns" brought about by continuous interactions (Bryant & Jary, 1991:7). Structure refers to the set of virtual "... rules and resources, organized as properties of social systems" (Giddens, 1984:25) that exist as transformational relations (Jones & Karstens, 2008; Jayatilika *et al.*, 2007).

Giddens defined structure as:

> "Rules and resources recursively implicated in the reproduction of social systems.
> Structure exists only as memory traces, the organic basis of human knowledgeability and
> as instantiated in action." (Giddens, 1984:377)

Structure enables action, but also places a restriction on the actions of human actors (Giddens, 1976:161). This restriction would imply a limitation of what is physically possible during interaction with structures (Sewell, 1992). Actors encounter structures with certain properties and through the collective interaction, shape these structures.

> "Structure thus refers, in social analysis, to the structuring properties allowing the 'binding'
> of time-pace in social systems." (Giddens, 1984:17)

Structure's position in the ST is important (Jones & Karstens, 2008). The location of structure is the most contentious issue in IS literature (Rose *et al.,* 2004). Importantly, Sewell (1992) argues that the virtual nature only extends to *structures as rules/schemas* and not to *structures as resources*. This physicality plays an important role in the application of ST as it brings the actor directly in contact with the limitations/facilitation of action through a physical environment.

Within ST, structure is virtual and not embedded in physical structures. This is essential for the purposes of using ST as a lens within technology related environments.

> "In IS terms, therefore, structure, as defined by Giddens, cannot be inscribed or embedded
> in technology, since to do so would be to give it an existence separate from the practices of
> social actors and independent of action, thereby turning the duality, which is such a central
> feature of Giddens's position, into a dualism. Ontologically, a structure that resides in a

real, material, artefact would also seem clearly distinct from one that exists only when instantiated in the practices of social actors." (Jones & Karstens, 2008:132)

Structure, according to Sewell (1992) poses certain challenges. Firstly, structure is assumed as being deterministic exerting power onto the actors within the structure. Secondly, a rigid view of structure poses challenges for discussions of change. Thirdly, that the view of structure differs from different philosophical viewpoints. Giddens' approach to structure extends the sociological view and presents structure as a process and not as a fixed state (Sewell, 1992). Sewell (1992) identifies three challenges in approaching structure:

- Role of social actors within structures;

- How change originates and permeates through structures;

- Semiotic vs. material view of structure.

These aspects indicate the importance of explicitly defining the key components of ST and its intended use. ST offers very specific views on this. To define structure seems illusive (Sewell, 1992) and Giddens, through structuration, introduced additional dimensions to the concept of structure. Again, structure's definition is distinctly virtual (non-physical) in nature. Structures and the rules that govern them exist in the mind's "memory traces" (Giddens, 1984) of individuals where actors draw on these rules and resources available to create and re-create structure (Brooks & Atkinson, 2004; Walsham, 2002). It would be incorrect to view structure as an observable construct.

Structure should not be seen as a physical but rather as an abstract concept. This means that the structures are part of a mainly subjective perspective of individual human actors. Structure is formed, not by either the actors or structures but by "... the two as a mutually constitutive duality." (Jones & Karstens, 2008:129). Human agents create and shape structure and at the same time are shaped by it. Thus, human actors and their actions is the core of the dynamic nature of ST. It is on the duality of structure that the criticism of ST falls (see Sewell, 1992; Callinicos, 1985). It is not the concept of structure itself but rather the way structure is formed and ultimately maintained, that is posing challenges. It is to be expected, as the process of creating structure is complex given its virtual nature.

The implication for the study of trust is that the trust "structure" of the service environment in this case, lingers (through memory traces) even when the user is not engaged with the institution itself. Trust exists in the memory traces of the actors, socially constructed/embedded within a contextual phenomenon

(Granovetter, 1985; Doney, Cannon & Mullen, 1998). The social nature of trust and the wider context is illustrated by Giusta (2007).

> "The relationship between social intermediation, market and legal system, however, is the key to understanding the emergence of more or less trusting environments, as agents will interact more or less frequently within each system depending on the success they have experienced with each, both in terms of achieving their purposes (that is, experiencing trustworthy behaviour) and in terms of feeling they can reliably do so on future occasions (that is, trusting the system)." (Giusta, 2007:66)

Technology does not embed trust within itself, a resultant structure and the institutional form it takes exist completely separate from the physical service structures. When trust is discussed, it is within this context, where the trust perceptions of the institution are not drawn from the technology but from the social structure formed through continuous interaction with the services and products institutions facilitate. This study excludes the conflict and transformative side of relationships actors have with the institution (See as an example Barret & Walsham, 1999).

4.4 Agency, actor, stratification

Agency refers to the free will intentions of the actor/agent to interact with structures, which is why agency implies power (Giddens, 1984). Three dimensions forms part of the conception of agent within Giddens' structuration theory (Stones, 2005):

- Motivation of action;

- Knowledgeability and the rationalisation of action; and

- Reflexive monitoring of action.

These are contained within the stratification model of Giddens and are an important component to understanding the *engine room* of the actor. This virtual action is described in the stratification model (Figure 4.18). In Figure 4.19, the various layers indicate the production and re-production of social structures. Stratification illustrates how human actors' reflexive monitoring of both their own actions and that of other actors, influence their future decisions; not only the observed actions but also the expected actions of other actors (Giddens, 1984) have an effect.

Unacknowledged
conditions of
actions

Reflexive monitoring of action
(discursive consciousness)

Unintended
consequences of action

Rationalization of action
(involving practical consciousness)

Motivation of action
(in part unconscious)
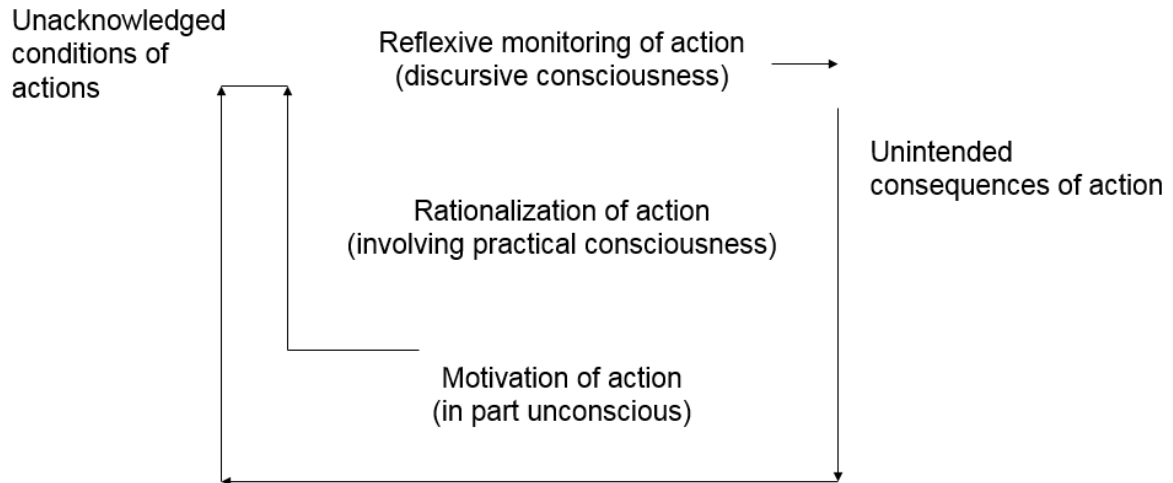
Figure 4.18: Stratification model
Source: Giddens (1984:5)

Reflexive monitoring of action forms the basis of knowledgeability (Poole & DeSanctis, 1990). Reflexive monitoring of action is defined as:

> "The purposive, or intentional character of human behaviour, considered within the flow of activity of the agent: action is not a string of discrete acts, involving an aggregate of intentions, but a continuous process." (Giddens, 1984:376)

Within ST the actor and the reflexive relationship with the environment is a continuous process through which power is used and actions are adjusted in a responsive manner.

> "That is to say, actors not only monitor continuously the flow of their activities and expect others do the same for their own; they also routinely monitor aspects, social and physical, of the contexts in which they move." (Giddens, 1984:5)

Action is central to the functioning of structuration. Giddens (1984) approaches this interaction from a social process perspective and places the emphasis on the action of participants as the source of social processes. Action is firstly an act; secondly, it is an expression of agency; thirdly it as a source of power and lastly the recursive nature of action that influences subsequent acts. The actions actors perform can be either as a routine task or as a task that sets out to affect change. The actions of the actors are constrained by the existing structure, but the actors have the power to influence the structure (Walsham, 2002).

Through human agency, the actor/s collective actions exert power on the structure and so transform the structure (Giddens, 1984). Giddens (1984) refers to this power as the transformative capacity of agency. Structure is partly routine-based and partly influenced by specific motivations of the actor/s through continuous action. Motivation for action could have unconscious activity as its source, or it could be motivated as a reaction to the perceived actions of others, or of the perceived nature of the structure. Stratification illustrates both a rational component, where rationality plays a role in influencing actions and the role of subjective influences.

> "To be a human being is to be a purposive agent, who has reasons for his or her activities."
> (Giddens, 1986:3)

Within these structures, the agent is the catalyst whose presence creates the dynamism of the social system. These knowledgeable human agents interact with the structure and in doing so, reshape it (Sewell, 1992). This power to affect structure is called transformative power.

> "… power is logically prior to subjectivity, to the constitution of the reflexive monitoring of conduct. It is worth emphasizing this because conceptions of power in the social sciences tend faithfully to reflect the dualism of subject and object referred to previously. Thus, 'power' is very often defined in terms of intent or the will, as the capacity to achieve desired and intended outcomes." (Giddens, 1984:15)

However, these outcomes could also have consequences. Actions have both intended and unintended consequences (Giddens, 1984). Unintended consequences, outcomes that the actor could not have anticipated, feed back into the productions of the structure through homeostatic loops. These are described as:

> "… causal factors which have a feedback effect in system reproduction, where that feedback is largely the outcome of unintended consequences." (Giddens, 1984:375)

> "Merton has provided perhaps the classical discussion of the issue. He points out, entirely correctly, that the study of unintended consequences is fundamental to the sociological enterprise. A given item of activity may have either (a) non-significant or (b) significant consequences; and either (c) singly significant consequences or (d) multiply significant consequences. What is judged 'significant ' will depend upon the nature of the study being

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undertaken or the theory being developed." (Giddens, 1984:12)

It is through agency (and the collective outcome of actions) that trust perceptions do not only manifest, but also collectively feedback perceptions, on which others have base decisions. The stabilisation of structures through routine action over time creates institutions with distinct structural properties (Black & Greer, 2009). This aspect is important when defining institutions. Institutions are not removed from the underlying social structures but are still shaped through the duality of structure on a continuous basis. In the same manner, the underlying trust structures are also formed along with actions of actors.

4.5 Duality of structure

Giddens places a significant focus on this deliberate action to invoke the creation of abstract structures. The dualism present in structures is described as follows:

> "One of the main propositions of structuration theory is that the rules and resource drawn
> upon in the production and re-production of social action are at the same time the means
> of system re-production (the duality of structure)." (Giddens, 1984:19)

The interaction between intentional actions of knowledgeable actors and a structure as properties of social systems forms the basis of the duality. This is significant in that the duality proposes a dynamism that is firstly not stable/fixed and secondly not only reliant on the actions of a single actor but also on that of a group of actors.

Within structuration Giddens presents three dimensions of structure namely, signification, domination and legitimation (Figure 4.19). Signification is formed through interpretive schemes. Domination in turn is linked to the distributional power of resources. Legitimation of conduct is created through generalised agreed norms.
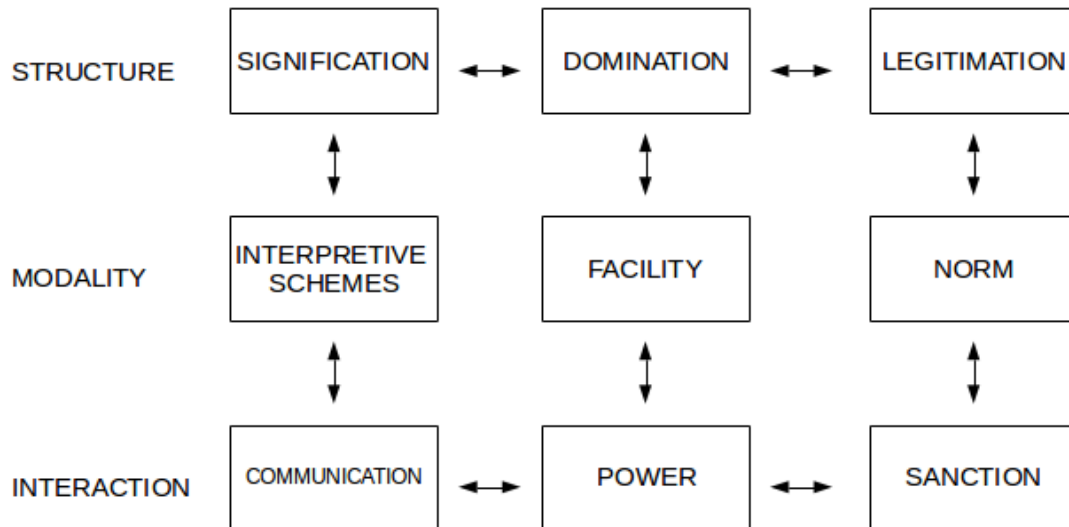
Figure 4.19 Dimensions of the duality of structure
Source: Giddens (1984:29)

Figure 4.19 illustrates the duality of structure, interaction between the actions of knowledgeable actors through modalities to affect structure. This production and re-production occurs through communication, the exercise of power and value/moral sanction of conduct. It is this formal and informal interaction, which creates trust in a ST context (Bachmann & Inkpen, 2011).

Returning to Figure 4.19, the top row refers to the various components of structure whereas the bottom row refers to the different forms of interaction. Between these two rows lie the various ways in which structure and interaction are connected. An interconnection is indicated by the various arrows that represents the duality of structures. The interconnectedness implies that these various components do not exist in isolation. The various structures combine to form a whole.

The core of the duality of structure is the resultant interactive structural dimensions of signification, legitimation and domination. These relate to user issues of understanding/misunderstanding, social acceptance/non-acceptance and control (Jayatilika *et al.*, 2007). The actors draw on interpretive schemes, facility and norms to interact with structures of signification, domination and legitimation. Interpretive schemes involve the sets of rules that actors draw on to make sense of what other actors say and do. Norms are all the rules that are drawn on to evaluate conduct. Facilities refer to the resources (material and non-material) that the actor employs. The 'virtualness' of structuration is central to the use of time and space.

Not being embedded in physical structures, the social structures are free to be influenced only through the actions of the participants and in doing so, reflect their perceptions of the legitimacy of these structures.

The structures tend to take on "… the character of day-to-day life" (Giddens, 1984:35) as routine and stability sets in:

> "Routinisation is vital to the psychological mechanisms whereby a sense of trust or ontological security is sustained in the daily activities of social life." (Giddens, 1984:xxiii)

Through interpretive schemes, structures of signification are drawn on in communication actions, but in the context of power sanction. Similarly, structures of domination are drawn on to exercise power through facilities in context of norms and interpretive schemes. Horizontally the interconnectedness shows that sanction cannot occur without facility to exercise such sanction. All these various elements are present in the duality as it plays out in a continuous basis across time and space.

Table 4.1: Duality of structure concepts

Interpretive schemes: are used by participants to interpret events surrounding actors. Shared knowledge and experiences create a set of parameters with which meaning is attributed. Interpretive schemes are influenced through social interaction, which can change (Orlikowski, 1992). Meaning is communicated through these interpretive schemes.
Norms: are frameworks that determine what actions are suitable or not. Through the collective actions, these norms are shaped to adapt to the "accepted" way. Norms are the rules and regulations that govern the "approved" actions and they create structures of legitimacy. These can be formal, cultural, or social. Participants are confronted by norms (structures of legitimation) created to structure expected behaviour.
Facilities: The use of resources is conducted to enforce a desired outcome. These resources afford power to the holder or controller of the resources. Structures consist out of resources, which in turn provide power to the users of these resources.

The dynamics of ST lies in the interaction between agents and structures through modalities. Modalities manifest themselves through:

> "... mediating artefacts, in documentation and in formalizations of action ... as well as in
> the formal and informal rules of behaviour, in particular social and organizational settings."
> (Brooks & Atkinson, 2004:394)

These modalities also serve as a scope for what future systems should consider in planning a similar system (Brooks & Atkinson, 2004). The modalities (Table 4.1) are not only part of the structural properties of structure but also the aspects that forms the boundaries:

"What I call the 'modalities' of structuration serve to clarify the main dimensions of the duality of structure in interaction, relating the knowledgeable capacities of agents to structural features. Actors draw upon the modalities of structuration in the reproduction of systems of interaction, by the same token reconstituting their structural properties." (Giddens, 1984:28)

The change exerted on structures occurs through actors exercising power and utilizing the structures of domination. Power is vested in resources and there cannot be power without resources (Jefferies, 2011). Actors "possess" or control resources through it allocation of use.

Resources are defined as:

"Resources (focused via signification and legitimation) are structured properties of social systems, drawn upon and reproduced by knowledgeable agents in the course of interaction. Power is not intrinsically connected to the achievement of sectional interests. In this conception the use of power characterizes not specific types of conduct but all action and power is not itself a resource. Resources are media through which power is exercised, as a routine element of the instantiation of conduct in social re production." (Giddens, 1984:15)

Domination does not necessarily imply a negative exercise of power. The ability to influence collective action can positively support the creation of trust relationships. To enforce trust however, there has to be a certain level of domination present. Actors are constantly in a state of interpretation and make value judgements on the environment (Resca, 2009). Only when actors are confronted with the actual interaction, is the perceptions adjusted to achieve an actual outcome.

4.6 Giddens' trust

Giddens (1990) explicitly clarifies trust within structuration in the "The consequences of modernity". Giddens (1990) makes a distinction between personal trust and trust in abstract systems using the analogy of money to show how physical structures could embed meaning and ultimately project trust within abstract systems. The "access points" between the institutional and the actor, the face-work opportunities, is where the trust perceptions of trustworthiness are created. Giddens states that:

"...that stable and anonymously working institutional arrangements, standards of expertise,

rules and procedures which are represented by these individuals, are the central source of system trust." (Bachmann, 2001:349)

Giddens (1990) makes a distinction between physical interactions (face-work commitments) and distant (faceless commitments). Face-work commitments are

"... trust relations, which are sustained by or expressed in social connections established in circumstances of compresence." (Giddens, 1990:80)

Faceless commitments refers to

"... faith in symbolic tokens or expert systems, which taken together, I shall term abstract systems." (Giddens, 1990:80)

Importantly Giddens (1990) positions this interaction between these two scenarios a follows:

"My overall thesis will be that all dis-embedding mechanisms interact with re-embedded context of action, which may act either to support or to undermine them; and that faceless commitments are similarly linked in an ambiguous way with those demanding face-work." (Giddens, 1990:80)

Within structuration, the physical interaction between actors and the faceless commitments are seen to create trust through the context of action (Giddens, 1990). Again, action plays a critical role. Trust placed in abstract systems does not pre-suppose any prior encounters at all with the other party (Giddens, 1990). Not only are these interactions between the actor and the abstract system part of trust forming, but so too is the interaction between actors within the abstract system (Giddens, 1990). Additionally, the "... nature of modern institutions is deeply bound up with the mechanisms of trust in abstract systems." (Giddens, 1990:83). Underlying trust in abstract systems is trust in the expertise of the other party (expert systems). This expert knowledge creates the "universe of events, as a result of the continual reflexive implementation of that very knowledge." (Giddens, 1990:84). The definition of access points are:

"Access points are points of connection between lay individuals or collectivities and the representatives of abstract systems. They are places of vulnerability for abstract systems, but also junctions at which trust can be maintained or built up." (Giddens, 1990:89)

It is through these access points that trust is re-embedded through recurring face-work commitments. The distance between these parties creates what Giddens (1990) calls dis-embedding. Through the facilitation of technology, dis-embedding social structures are extended across time/space dimensions.

> "By dis-embedding, I mean the "lifting out" of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space." (Giddens, 1980:21)

Temporal and spatial separation decrease certainty, increase risk and requires more trust (Riegelsberger *et al.,* 2005). Frequency of interaction is required to sustain trusting perceptions.

> "One of structuration's primary contributions to social theorising is its clear identification of the role of repetition and duration of certain interactions, which give some social processes more structural influence on subsequent interactions than others." (Black & Greer, 2009:6)

Giddens (1990) further distinguishes between symbolic tokens and expert systems. Symbolic tokens are described as:

> "... media of interchange which can be "passed around" without regard to the specific characteristics of individuals or groups that handle them ..." (Giddens, 1990: 22)

Expert systems are described as:

> "By expert systems, I mean systems of technical accomplishment or professional expertise that organise large areas of the material and social environments in which we live today." (Giddens, 1990: 27)

Giddens (1990) is explicit about the role that trust plays in dis-embedding:

> "All dis-embedding mechanisms, both symbolic tokens and expert systems, depend on trust… Trust here is vested, not in individuals, but in abstract capacities." (Giddens, 1990:26)

Giddens (1990) uses a very clear objective definition of trust as a social construct. He states that dis-embedding mechanisms "... remove social relations from the immediacies of context." (Giddens, 1990:28). Trust is distinctly virtual memory traces that represent certain perceptions of the institution. Thus, trust structures are formed and maintained within the actor as part of stratification and becomes a virtual concept.

As actors interact with the institution (a market), this structure is constantly changed as the perceptions of the user is affected through the reflexive monitoring of trust signals from both the institutional structure as well as the actions of others.

> "If trustor and trustee are separated in space, their interactions will be mediated (e.g. by mail, email, telephone) and some of the signals that are present in face-to-face encounters may not be available or become distorted." (Riegelsberger *et al.,* 2005:387)

Giddens establishes trust as part of the forming and functioning of institutions. Figure 4.20 provides a summary of trust concepts put forward by Giddens (1990). These points are elaborated on in following chapters. The above discussion highlights the underlying role that trust occupies in ST and points to the suitability of structuration as a theoretical lens for trust specifically within an institutional context.
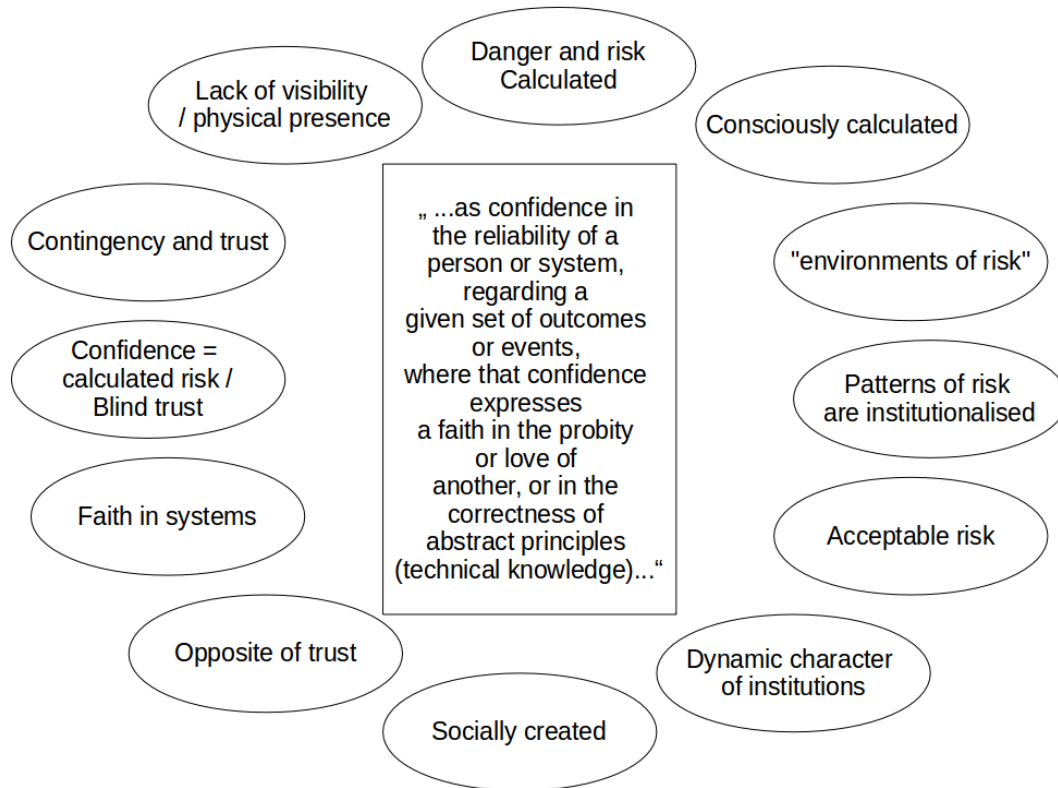
Figure 4.20: Trust elements
Source: Giddens (1990)

4.7 Evaluation of Structuration Theory

ST has found resonance in the IS community as a theoretical base for researchers and forms part of the recognised theories used in IS research (Larson, Allen, Vance and Eargle, 2014). Giddens refers to ST as a meta-theory, a theory of theories, which is a theory with a high level of abstraction that allows a way to interpret other theories (Gregor, 2006). A holistic view of SSTs requires a theoretical approach that is broad enough to accommodate social, organisations, technological issues and is flexible enough to assist in understanding the actions of actors. But this also leads to criticism levied against ST (Stone, 2005). Thus, the application of ST needs to be at an ontologically broad level. The elegance of the description of dynamic forces that shape structures provides a tempting opportunity to describe more *in situ* phenomenon. ST accommodates the virtual subjective nature of a social phenomenon like trust. This is apart from the explicit recognition of trust as part of the actor's environment (See Giddens, 1990).

Structuration is distinctly suited to interpretive approaches due to the explicit recognition of the social interaction (duality) between people and their environment (Jayatilika *et al.,* 2007). By implication the

structures is never in a state of stability and is always open to change. ST is a good philosophical base as it explicitly recognises social processes and arguably bridges the positivist-interpretivist divide. ST has also been linked successfully to other theories for research purposes (Jayatilika *et al.,* 2007). However, most of the criticism as far as information systems research is concerned hinges on this fact.

The fact that the structures in structuration are virtual and exists only in the minds of the actors, poses some challenges to IS research. Jayatilika *et al.* (2007) indicates that the theory is comprehensive (used directly vs. indirectly) in that it covers structure and processes. However, these structures could be so interwoven that distinguishing it apart might be challenging (Chu & Smithson, 2007). Questions could also be raised regarding the suitable methodology used with ST. The researcher needs to apply methods at their own discretion and approach the study using the methodologies viewed as most suited. Without a clear definition of the various assumptions, it could pose epistemological issues (Rose & Scheepers, 2001). Structuration lends itself to interpretivist approaches and as such allows the specific topic to guide the specific interpretive related method.

Giddens positions ST as a distinct interpretive theory:

> "... that the only form of 'theory' worthy of the name is that expressible as a set of deductively related laws or generalizations." (Giddens, 1984:xviii)

High levels of abstraction pose challenges to the empirical application of structuration as a theoretical framework (Pozzebon & Pinsonneault, 2005). The extent to which ST is applicable will largely depend on the focus of its specific application. In this instance, the subject of trust is a highly social one and one could argue, cannot be embedded into any technology structure. For this reason, the case environment as well as the topic requires a broader social approach to the relationship between technology and institutional trust. The research theme also covers the structuring of social structures around trust through a recursive process adequately described by stratification. Technology presents a conduit through which structuring occurs Within ST, specific reference is made to concepts such as access points, expert system, embedding, dis-embedding, which read within the technological context of modern times, resonates with the virtual nature that SST operates in. It is for these reasons that structuration forms a suitable option to look at the social context on markets.

4.8 Extension of Structuration Theory

Giddens' work has been applied to the information systems field by various authors over the past three decades (See Chu & Smithson, 2007; Orlikowski & Robey, 1991; Orlikowski, 1992; Orlikowski, Yates, Okamura & Fujimoto, 1995; Walsham & Sahay, 1999) and has received a significant amount of attention (Walsham, 2002; Jones, Orlikowski & Munir, 2004). Giddens' ST is a social theory rather than an information systems theory (Jones & Karstens, 2008). The theory has found a broad application within IS research and is seen as a suitable approach to the study of IS (Larsen, Allen, Vance & Eargle, 2014; Walsham, 2002). Most notably the work of Orlikowski as well as DeSanctis and Poole (1994), who extended ST into the field of technology. Walsham (1993) employed structuration to "*... consider wider systems of power relations and norms within which they were located*".

Walsham (1993) argues:

> "A theoretical view of computer-based information systems in contemporary
> organizations, which arises from structuration theory, is that they embody
> interpretative schemes, provide coordination and control facilities and encapsulate
> norms. They are thus deeply implicated in the modalities that link social action and
> structure and are drawn on in interaction, thus reinforcing or changing social
> structures." (Walsham, 1993: 64)

The relationship between technology and the organization has played a central role in IS research (Orlikowski, 2005b). Actors enact structures that shape and form situated and emergent use of technology over time. A recursive interaction between the agency and technology introduces change that leads to the transformation of structures which in turn influences agency (Orlikowski 1999:2000). Structures enacted are not to be found outside and independent of human agency but internal to the actor (Orlikowski, 1999; Rose *et al.*, 2004).

> "...technology is socially constructed by actors through the different meanings they attach
> to it and the various features they emphasize and use." (Orlikowski, 1992:400)

> "Users' *interaction with a technology is thus* recursive in their recurrent practices, users
> shape the technology structure that shapes their use. Technology structures are thus not
> external or independent of human agency; they are not "out there" embodied in

technologies simply waiting to be appropriated. Rather they are virtual, emerging from people's repeated and situated interaction with particular technologies. These enacted structures of technology use, which I term technologies-in-practice, are the sets of rules and resources that are (re)constituted in people's recurrent engagement with the technologies at hand." (Orlikowski, 2000:407, *own emphasis*)

Orlikowski's extension of structuration lies in the concept of technologies-in-practise, the "… emergent technology structure, which allows us to frame what users do with technologies as a process of enactment." (Orlikowski, 1999:6).

"… it is only when repeatedly drawn on in use that technological properties become constituted by users as particular rules and resources that shape their action." (Orlikowski, 2000:408)

Orlikowski and Robey (1991), proposed four aspects that characterises the interaction between the organisation and technology. These are:

- Technology as way of action;

  Technology affects the way actors operate, which in turn affects the technology in unpredictable ways.

- Technology's influence on the social environment within which it operates;

  The actors have a transformative power to affect change to social environments.

- Technology as a product of human action;

  The design of the technology will reflect functional priorities, agendas of those that create it.

- Technology is constructed within a specific social context;

  This interaction is according to the duality of structure.

Technology represents a mechanistic physical structure, yet it is also the result of human planning and action, as "... technology has its own logic-determining usage and development." (Bartis, 2007).

"… technology is, on the one hand, an identifiable, relatively durable entity, a physically, economically, politically and socially organized phenomenon in space-time. It has material

and cultural properties that transcend the experience of individuals and particular settings. In this aspect, it is what we may call a technological artefact, which appears in our lives as a specific machine, technique, appliance, device, or gadget." (Orlikowski, 2000:408)

Orlikowski's structuration model comprises three main components: human agents, technology and institutional properties of organisations. Humans create structures by creating interpretive schemes (rules related to knowledge pertaining to the work being created), facilities (resources to draw on to create the work) and norms (organisational rules dictating the way the work is to be performed) (Orlikowski, 1999). Key to Orlikowski (2000) is the relationship between recurrent use of technology and enacted "technology-in-practice" over time (Figure 4.21):

"Over time, through repeated reinforcement by the community of users, such technologies-in-practice may become reified and institutionalized, at which point they become treated as predetermined and firm prescriptions for social action and as such, may impede change." (Orlikowski, 2000:411)

Orlikowski's approach as outlined above is to be used as a theoretical lens to view human agency and the resultant emergent structures that are enacted within the fresh produce market environment. Using a tool that extends structuration cannot ignore the broader social dynamics (legitimation, domination and signification structures) and its influence on agency. The broader context of action (Stones, 2005) could include aspects that motivate the use of the technological artefact. This might for example relate to institutional power that shape the broader organisational structures within which actors operate. A social concept such as institutional trust originates within the broader institutional structures which in turn will affect agency related to the use of the artefact itself. Norms are influencing the actor, both from a technological and social perspective. Trust is discussed in chapter 5 and the institutional dynamics discussed there surrounding especially institutional trust illustrates this point.
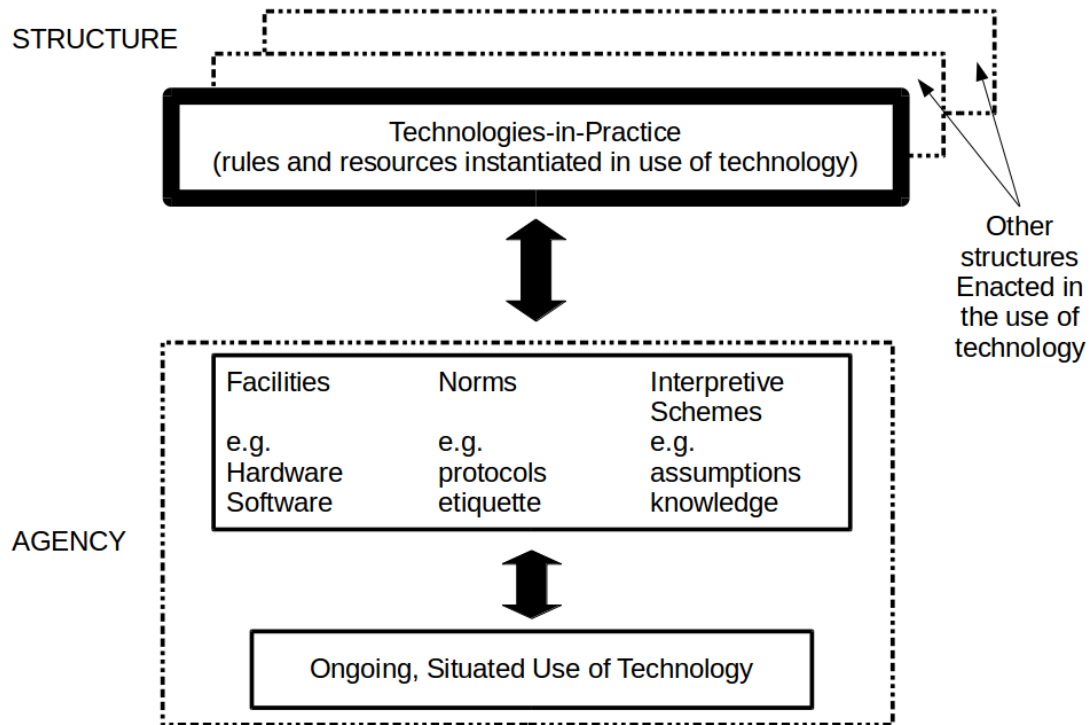
Figure 4.21: Enactment of technologies in practice
Source: Orlikowski (2000:410)

4.9 Concluding summary

This chapter presents a background on ST and motivates the use of a structuration approach as a theoretical lens for this study. The study focusses on the social aspects surrounding the use of technology on markets and thus requires a suitable approach that recognises social dynamics as part of technological interaction. Table 4.2 establishes the relevance between key literature terms and its use in the thesis.

Table 4.2 Overview of relevant literature terms

Key term	Relevance to case interpretation and framework
Structuration	The interaction between an actor and the institutional environment requires the enactment of these structures through technology in this case.
Agency and actor	These are positioned as central to the functioning of the market environment.
Stratifcation	The process through which the actor models its perceptions is central to understanding the dynamics within structureation.

Duality of structure	This allows us to map the physical environment to the virtual and provides us with a framework to describe the various activities on the market.

Key aspects of ST such as structure, agency and the duality of structure are discussed. Focus also falls on trust within ST. Although not explicitly incorporated in the duality of structure, Giddens (1990) does recognise the important role trust plays in facilitating the interaction within structuration. Using SST, perceptions relating to trust in the institution are shaped by the actor's perceptions of the institution itself, over and above any structuring perceptions technology might introduce. Although ST is a social theory, various authors have used the theory within technological contexts to investigate social related aspects within technological contexts. Through the contributions of these authors, ST has been established as a recognised theory in technological fields. The next chapter introduces the literature on trust.

Part 2: Literature Review

CHAPTER 5: TRUST CONCEPTS

CHAPTER ROADMAP

PART 1 - INTRODUCTION	
Chapter 1	Introduction
Chapter 2	Research Methodology

PART 2 – LITERATURE REVIEW	
Chapter 3	Approach to the Literature Review
Chapter 4	Structuration Approach
Chapter 5	Trust Concepts
Chapter 6	Governance and Markets
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CHAPTER 5: TRUST CONCEPTS

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"Your corn is ripe today; mine will be so tomorrow. 'Tis profitable for us both that I shou'd labour with you today and that you shou'd aid me tomorrow. I have no kindness for you and know that you have as little for me. I will not, therefore, take any pains on your account; and should I labour with you on my account, I know I shou'd be disappointed and that I shou'd in vain depend upon your gratitude. Here then I leave you to labour alone: You treat me in the same manner. The seasons change; and both of us lose our harvests for want of mutual confidence and security."

(David Hume in Baily, 2002:2)

5.1 Introduction

This chapter presents various aspects of trust. Trust is a concept that we all seem to understand until we are confronted with the need to explain its inner workings. Wicks, Berman and Jones (1999) compare trust

to the finding of the golden mean, Aristotle's excess/over investment and deficiency/underinvestment in the other party's conduct. The early approaches and views of trust were from a context where man was seen as a brutish beast in a violent environment. Fear of detection and punishment governed trust relations and in the event of suspicion, the option to attack first was seen as the best option (Baily, 2002):

> "As Hobbes puts it, '*there is no way for any man to secure himself so reasonable as anticipation, that is, by force or wiles to master the persons of all men he can'*. From this, mutual suspicions and attacks will spiral and Hobbes reaches his famous conclusion: in a state of nature, there would be 'war…of every man against every man' and life would be 'solitary, poor, nasty, brutish and short.'" (Baily, 2002:2)

Hume as quoted in Baily (2002) described the trust relationship (using an agricultural analogy) as follows:

> "Your corn is ripe today; mine will be so tomorrow. 'Tis profitable for us both that I shou'd labour with you today and that you shou'd aid me tomorrow. I have no kindness for you and know that you have as little for me. I will not, therefore, take any pains on your account; and should I labour with you on my account, I know I shou'd be disappointed and that I shou'd in vain depend upon your gratitude. Here then I leave you to labour alone: You treat me in the same manner. The seasons change; and both of us lose our harvests for want of mutual confidence and security." (Hume in Baily, 2002:2)

Trust has received a significant amount of attention across multiple academic disciplines (Schultz, 2006; Li, Hess & Valacich, 2008) since its mainstream introduction in the 1960s (Mayer, Davis & Schoorman, 1995). A substantial amount of literature exists which covers trust from a psychological, organisational, managerial and physiological dimension. Trust is widely accepted as the core of human interaction and exchange (Guenzi, Johnson & Castaldo, 2008).

Trust facilitates cooperation (Mayer *et al.,* 1995), reduces agency and transaction costs (Williamson, 1979; Jones & Sasser, 1995) and regulates efficient market exchanges (Arrow, 1974). Trust plays a key role in business relationships (Dasgupta, 1998; Gambetta, 1988). A new field is emerging, that of facilitating trust signals through technology, where face-to-face interactions are replaced with human-computer interaction (Riegelsberger *et al.,* 2005). Humans perceive and interact with technology and attach meaning in these contexts to this interaction (Corritore, Kracher & Wiedenbeck, 2003). Trust is seen as important by researchers as it affects the adoption and use of e-commerce type ventures (Grabner-Krauter &

Kaluscha 2003; Koufaris & Hampton-Sosa, 2004; Schultz, 2006; Riegelsberger *et al.,* 2005; Siau & Shen 2003).

Two distinct approaches to trust is found in the literature, personal trust and institutional based trust (Welter & Alex, 2011). Trust has been established as a central concept in constructive relations between people and firms and in broader interaction and cooperation (Li, 2011). The distinction between these two fields are not always clear. Trust is a social construct and ultimately people create trust perceptions, which lead to trust actions. One cannot ignore personal trust, as this is present in all business relationships (Williamson, 1993), even as one moves to broader organisational and institutional contexts. Trust is complex and poses significant challenges due to the distinct personal dimensions (cognitive, emotional and behavioural) and the contextual dimension (organisational, institutional and technological) (Lewis & Weigert, 1985). Approaches to trust cannot ignore the broader contextual properties (Corritore *et al.*, 2003). Trust is a personal construct influenced by the specific context. Six (2014) points out that the institutional approaches should take into account the recursive nature of trust.

We have to acknowledge that lack of trust is a fundamental issue in online contexts. Lack of trust is an inhibiter of trade (Kim, Xu & Koh, 2004) and a central part of a business relationship regardless of whether it is online or off-line (Molm, Takahashi & Peterson, 2000) institutional or personal.

> "The importance of trust can be explained by the fact that it is seen as a phenomenon which contributes to the strength of interpersonal relationships, intra-organisational relationships and inter-organisational relationships." (Svensson, 2001:431)

> "Although electronic commerce is no longer a new phenomenon, our understanding of the factors and means that influence consumer trust in e-commerce effecting transactions between online companies and consumers is still limited." (Schultz, 2006:5)

The potential trust situations are not only limited to a human-technology interaction as each self-service is part of an institutional trust context in which the intentions of both the trusting party and of the service provider play a role in forming trust relations (Lee & Turban, 2001). Under the same conditions, different individuals will act differently (Riegelsberger *et al.*, 2005) as cultural differences between organisations, individuals' perceptions and interpretations of trust concepts differ (Lyon, 2012). The nature of social ties mitigate uncertainties among individuals (Mizruchi & Stearns, 2001). This is a key aspect of the argument that trust reduces transaction costs between supplier firms and customers (Granovetter, 1985; Uzzi, 1997).

The specific nature of trust within electronic exchanges is not yet fully understood. This argument is complicated in the modern digital world where specifically security, privacy and opportunistic behaviour affects electronic activity (Lee & Turban, 2001) in a much more direct and immediate way, or as Bachmann (2001) puts it:

> "While hierarchical relations are mainly controlled by bureaucratic procedures and top-own mechanisms of co-ordinating interactions, market relationships between anonymous buyers and sellers are based on the idea that economic actors simply use their individual resources and market power to follow their idiosyncratic interests, irrespective of what damage they might impose upon others." (Bachmann 2001:338)

Power asymmetries plays a key role in how parties dominate each other within trade. As part of SST these power positions has to be equalised in order to attract actors to a SST solution. Technology has to play a direct role in addressing these structures. This chapter starts out with an overview of trust research after which specific reference is made to Giddens' view on trust. The chapter also develops the definitions of trust that will be utilised.

5.2 Trust research

Trust research has reached a level of maturity according to Bachmann (2012). Some key works were published indicating a renewed focus on trust, especially on institutional trust. These are:

- Handbook of Trust Research (Bachmann & Zaheer, 2006);

- Handbook of Research Methods on Trust (Lyon, Möllering & Saunders, 2012);

- Journal of Trust Research (Launched in 2011);

- Landmark Papers on Trust (Vol. I and II) (Bachmann & Zaheer, 2008)

The Handbook of Trust Research provides an overview of the micro-, organisational-, cross-level (intra-organisational) and society/economic level. The research methods on trust introduce various approaches to trust on a micro level. The Journal of Trust Research (JTR) is a dedicated research journal of trust that was launched in 2011. Landmark papers on trust provide a collection of articles stemming from the origins of trust research to the various research topics relevant to research in general.

The philosophy of the Journal of Trust Research provides insight into the modern trend and approach to trust research:

> "JTR is particularly interested in those studies that are inter-disciplinary, cross-cultural, cross-level, multi-method, context-rich, process-oriented and practice-relevant in perspectives, so as to effectively investigate the holistic content and dynamic process of organisational and societal trust, without the perils of reductionist assumptions. JTR identifies the above as the emerging trends with the greatest potential to contribute to our rich and deep understanding about the complex phenomenon of trust." (JTR, 2015)

It is evident from the above that the agenda is broad, complex and multi-layered comprising cognitive, affective, behavioural, economic and ethical components (Lewicki & Brinsfield, 2012; Uslaner, 2012; Bachmann, 2012; Lyon, Möllering & Saunders, 2012). The key focus areas of the JTR (2015) are illustrated by the following:

- General research on trust at and across the levels of individual, group, organisation, community and nation;

- Specific research on trust management within and between organisations and societies;

- Specific research on inter-organisational and social trust within and across nations.

- General research on trust to build an integrative framework with a common language across disciplines and across cultures (building upon but extending beyond disciplinary and cultural perspectives);

- Specific research on trust management within and between organisations and societies;

- Specific research on interpersonal trust within and between organisations and societies;

- Specific research on institutional trust within and between organisations and societies;

- Specific research on inter-organisational and social trust within and across nations.

Many of the approaches however still assume "rational, self-interested behaviour affected minimally by social relations" (Granovetter, 1985:481). Trust is socially constructed and context dependent (Welter & Alex, 2012; Gillespie, 2012; Schultz, 2006) and this creates challenges for research (Lyon *et al.*, 2012).

Trust is also highly situational and content specific (Lee & Turban, 2001). As an example, Tillmar (2012) refers to the fact that in the absence of formal rules or legal remedies, people invent reasons to trust. Thus, trust is reliant on much more than mere formal structures of contract enforcement and monitoring, the individual is in a position to fabricate trust perceptions as required. The dynamic element of trust is such that it is "... built up, used, maintained, broken and repaired" (Lyon *et al.*, 2012:11). Where and how this happens, how trust is embedded seems to be a highly subjective concept, with or without formal structures to enhance trust. Figure 5.22 and Figure 5.23 provide an outline of how trust could be broken up into various clusters for research purposes.
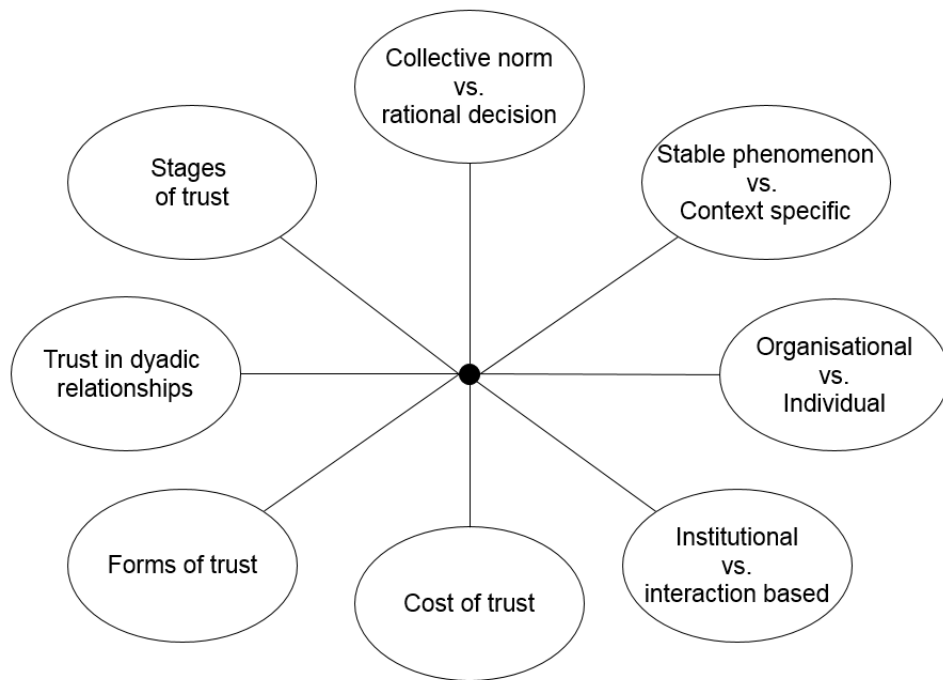
Figure 5.22: Eight areas of trust research
Source: Bachmann and Zaheer (2008)
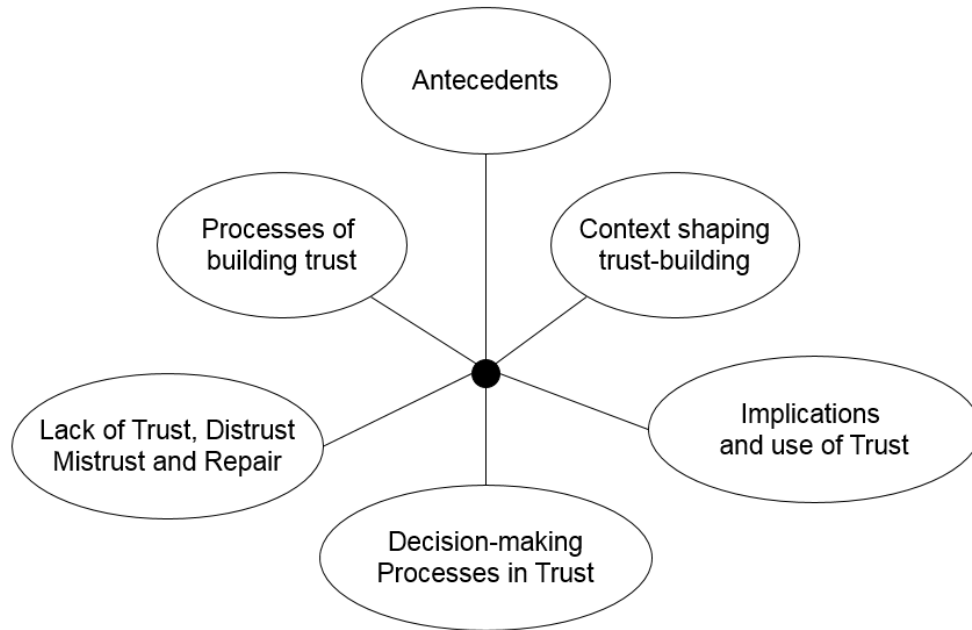
Figure 5.23: Six clusters of trust research
Source: Lyon (2012)

The dominant form of trust research is the micro-level approach. This typically involves the game theory approach and two-actor dyadic trust situations. These models are characterised by a set of choices, a sequence at which these choices are presented and a set of information available to the actors for making choices (Barrera, Buskens & Raub, 2012). The dyadic nature of the approach to trust bears particular challenges when scaling to larger settings where inter-relational issues are more complex and multi-nodal (Ferrin, Bligh & Kohles, 2012). This challenge seems to be the focus of an emerging field of a broader focus on trust in the more institutional context.

Lyon *et al*. (2012) lists five methodological challenges encountered when researching trust:

- The dynamic process of trust;

- Tacit elements;

- Cultural context;

- Researchers role in the researchers;

- Ethics of trust research.

Mayer *et al*. (1995) lists the following challenges approaching the concept of trust:

- The difficulty of defining trust (Delhey & Newton, 2003);

- Confusing trust with its antecedents and outcomes;

- Failing to clearly understand the relationship between trust and risk;

- Confusing the levels of analysis due to lack of specificity of trust referents;

- Failing to consider both the trusting party and the party to be trusted.

Trust is "evidentiary" requiring the preferred longitudinal approach (Lyon *et al.,* 2012); Lewicki & Brinsfield, 2012) and a move away from purely statistical methods to case studies and ultimately to agent-based methods in trust-research to capture how the interactions produce trust over time.

> "The reason why we have not yet progressed further in analysing the role of institutions in trust building processes may have to do with the fact that the phenomenon of institutional-based trust does not enjoy undivided interest in the research community." (Bachmann & Inkpen, 2011:4)

The following section looks at the various definitions of trust.

5.3 Definitions of Trust

Trust is a broad concept (McKnight, Cummings & Chervany, 1998) and is difficult to define and measure due to its implicit nature (Zucker, 1986). At the core, lies an emotional and cognitive component embedded in individuals (Bachman & Zaheer, 2008) who find themselves in a specific context. This complexity surrounding trust is reflected in the various attempts to define trust. Definitions of trust vary greatly (Schultz 2006, Jøsang and Pope, 2005) and a singular definition still eludes us (Das & Teng, 2001). No singular definition of trust exists that will cover all of its potential applications. There is however broad approaches to the definition, which range from a cognitive view characterising early definitions to that of a mere calculative action of bounded rational individuals (See Rotter, 1967; Deutsch, 1958; Williamson, 1993). Lee and Turban (2001) summarised the various approaches as follows:

- Personality theory: Trust is part of the individual's personality and upbringing.

- Socio-economic: The trust internally in organisations, trust formed between organisations, employee vs. organisation trust (Mayer *et al.* 1995) or individual vs. a collective institution

(Bachman & Zaheer, 2008)

- Social psychology: Transactional trust based on expectations of the trusting party. This includes the trusting factors in the environment that either strengthens or weakens this relationship.

Wicks, Berman and Jones (1999) warn that discussions about trust can easily become self-fulfilling prophecies. As Gilbert (1996) argues, opportunism (or agency and transaction problems) abounds "if we go looking for it" (1996:174).

> "The more we assume opportunism or see the world in terms of the prisoner's dilemma (or any other heuristic, like transaction cost economics, which predisposes one against trusting), the more likely we are to think and act like the prisoners in the model and become "prisoners of the prisoner's dilemma." (Wicks *et al*., 1999:102)

As a starting point, trust is viewed as a cognitive process regardless of the source or nature of the trustee or the context. Any discussion has to incorporate personal aspects (on the actor level), as interactions between organisations need to take individuals into account (Rousseau, 1985). Interaction between organisations still relies on individual interactions between its members. These individuals have various approaches to trust (Mayer *et al.,* 1995) of which none can be seen as fixed. From a psychological view, trust is the cognitive process whereas in a sociologist approach *trust is a characteristic of an institutional structure (*Zucker, 1986). Trust is informed by both the personal as well as the institutional level.

As an introduction, the definition according to the Oxford dictionary is provided.

Table 5.1: Oxford definition of trust
Source: oxforddictionaries.com, not dated

Definition of Trust:
noun
1 *[mass noun]*
firm belief in the reliability, truth, or ability of someone or something: *relations have to be built on trust they have been able to win the trust of the others*
acceptance of the truth of a statement without evidence or investigation: *I used only primary sources, t*aking *nothing* on trust
the state of being responsible for someone or something: *a man in a position of trust*
count noun literary a person or duty for which one has responsibility: *rulership is a trust from God*

Trust is placed in "someone or something" (an object of trust) through a belief in the reliability, truth and ability of that other party. The definitions cited the most, are those from Rousseau, Sitkin, Burt and Camerer (1998) and of Mayer *et al.* (1995), being cited 1 300 and 650 times respectively (Gillespie, 2012).

> "Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another." (Rousseau *et al.*, 1998)

> "Trust is a willingness to be vulnerable to another party based on both the trustor's propensity to trust others in general and on the trust or truster's perception that the particular trustee is trustworthy." (Mayer *et al.*, 1995:712)

> "Trust may be defined as *confidence in the reliability of a person or system, regarding a given set of outcomes or events*, where that confidence expresses a faith in the probity or love of another, or in the correctness of abstract principles (technical knowledge)" (Giddens, 1990:34, *own emphasis*)

Other definitions are:

> "From a sociological perspective, trust is defined as a set of *expectations shared by all those* involved in an exchange." (Zucker, 1986:54, *own emphasis*)

> "… the mutual confidence that no party to an exchange will *exploit another's vulnerabilities* … an exchange partner as one who is trustworthy when it is worthy of the trust of others." (Barney & Hansen, 1994:176, *own emphasis*)

> "Interpersonal trust is defined here as an expectancy held by an *individual or a group* that the word, promise, verbal or written statement of another individual or group can be relied upon." (Rotter, 1967:651, *own emphasis*)

> "Trust can be defined as one party's confidence in an *exchange partner's reliability and integrity.*" (Morgan & Hunt, 1994:23, *own emphasis*)

> "Trust is a particular level of *subjective probability* with which an agent assesses that another agent or group of agents will perform a particular action, both before he can monitor such action (or independently of his capacity ever to be able to monitor it) and

in a context in which it affects his own action." (Gambetta, 1988:217, *own emphasis*)

"... the belief that a party's word or promise is reliable and a party will fulfil his/her obligations in an exchange relationship." (Warrington, Abgrab & Caldwell, 2000)

"... a willingness to rely on an exchange partner in whom one has confidence." (Moorman, Zaltman & Deshpande, 1992:315)

"… a party's expectation that the other party will not behave *opportunistically* in the face of the beneficial opportunity to do so— implies that, without a conflict of interest, the issue of trust is irrelevant." (Van Witteloostuijn, 2003:54, *own emphasis*)

In this thesis, trust is defined as (based on Mayer *et al.,* 1995; Rousseau *et al.*, 1998; Six & Nooteboom, 2003):

> *A psychological state characterised by the intention to deliberately be exposed to the vulnerability of actions of another party based on an expected outcome.*

The person-level definition is used because it is firstly the individual that performs the trust act (as part of stratification) and secondly trust definitions incorporating institutional aspects is still not clearly defined. The following section discusses the institutional level aspects of trust.

McKnight and Chervany (2002) outline the object of trust as presented in Figure 5.24. The discussion within this chapter can be positioned within these various scenarios. The approach of this thesis is indicated by the grey arrow. Regardless of what the ultimate trust object is, the action of trust occurs via a technology interface. This trust formation is over and above trust in the technology object/artefact and/or its structuring properties as approached by Orlikowski. Not one of these approaches can be seen in isolation. Each of these types of trust work together to form the multitude of trusting behaviours that are observed.

The following section discusses the institutional nature of trust.

Nominative /Noun	Predicate /Verb	Direct Object	Type of Trust Concept
Trusting party	trusts	Trustee	(various)
E-commerce customer	trusts	E-vendor	(Interpersonal)
E-commerce customer	trusts	The web itself	(Institutional)
USER	trusts	INSTITUTION via A TECHNOLOGY INTERFACE	(Institutional)
E-commerce customer	trusts	others generally	(Dispositional)

Technology interface

Figure 5.24: The grammar of trust
Source: Adapted from McKnight and Chervany (2002)

5.4 Institutional approach

Institutional based trust has its origins in the significant social distances that characterises modern day trade (Zucker, 1986). Intermediary mechanisms (such as contracts and governance structures) assist the creation of institutional trust frameworks. Within this institutionalised context there needs to be a deliberate effort to create and communicate trust-building information. Building up a history of transactions creates a source of reference material, idiosyncratic understanding and rules to determine trust-building judgements. This was called "clientalization" in Zucker (1986). In smaller industries, these relationships are typically intertwined with personal relationships such as in family businesses. As a business grows, however and the nodes increase, this communication needs to be replaced by other more context specific signals. Zucker (1986) argues that institutionalised trust is a commodity that is produced as person-specific (Das & Teng, 1998).

Institution based trust refers to the structures that are available to the individual that offer amongst other things, *assurances to the broader participants in a generic manner (laws and regulations).* If these are

sufficient the expectation exists that one can proceed. Trust is a highly context-dependent construct focusing on the organisation (Doney *et al.,* 1998; Gillespie, 2012; Ferrin *et al.*, 2102) whereas institutional trust is focused on the broader social context. Institutional trust and system trust can be seen as one concept although a careful clarification is required in certain contexts (Bachmann, 2001; Schultz, 2006). Schultz (2006) positions institutional trust explicitly as part of different dimensions of trust formation (Figure 5.25).
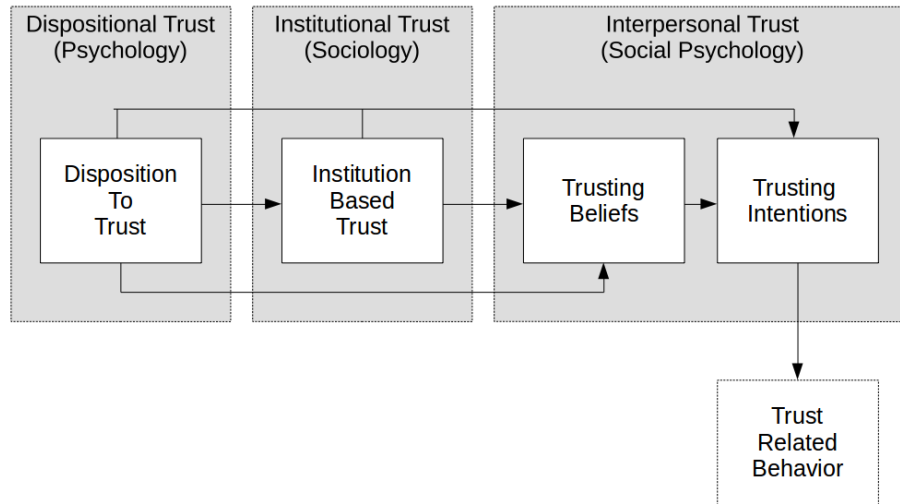
Figure 5.25: Interdisciplinary model of trust concepts
Source: Schultz (2006:2)

Within the inter-organisational context, Zaheer *et al.* (1998) showed that inter-personal and inter-organisational trust is correlated and that the organisational boundary spanners play a role as contact points. Of specific significance is the fact that just as trust is placed in individuals, it is also placed in social structures and the rules that govern those structures; thus an abstraction of trust perceptions.

"In the analysis of trust, we are inevitably drawn to the complex two-way interrelationships between it, the economic and political fabric of society and the individuals who constitute that society. On the one hand, we may be concerned with its role in the creation of that fabric and its psychological impact on the individual and on the other we may be concerned with how that fabric and the properties of those individuals can serve to maintain trust and any associated cooperative behaviours." (Good, 2000:1)

The role of the individual is further supported by Six (2014):

> "To fully understand the sources and the mechanisms of institution-based trust requires taking into account the peculiar bond that actors have with their own institutional framing as a condition of stability of their common-sense world. People rely on institutions to interact on daily basis and reflexivity is the mechanism that operates the equilibrium between individual reason and institutional routine." (Six, 2014:19)

> "… depending on the institutional environment, there are two distinct patterns of controlling relationships, where trust and power are interrelated in quite different ways. First, both mechanisms are generated at the inter-personal level and either trust or power dominates the relationship. Second, power occurs at the level of the structural framework of relationships and is highly conducive to developing trust between individual organizations. Thus, specific forms of trust and power are identified and the institutional environment is viewed as playing a crucial role in shaping the quality of trans-organizational relations." (Bachmann, 2001:337)

Trust literature seems to focus more on trust from the micro-level (inter-personal) perspective (Bachman & Inkpen, 2011). Bachmann (2001) makes a distinction between the micro and the macro levels of trust. Currall and Inkpen (2002) illustrate the multiplicity of institutional trust and personal interaction (see Figure 5.26). The truster-trustee relationship is a combination of interactions that range from the person-person to the firm-firm relationships. Figure 5.26 highlights that the individual is present in all institutional type relationships (firm and group). Although the signals that these configurations might create could differ, the person has to interpret them.
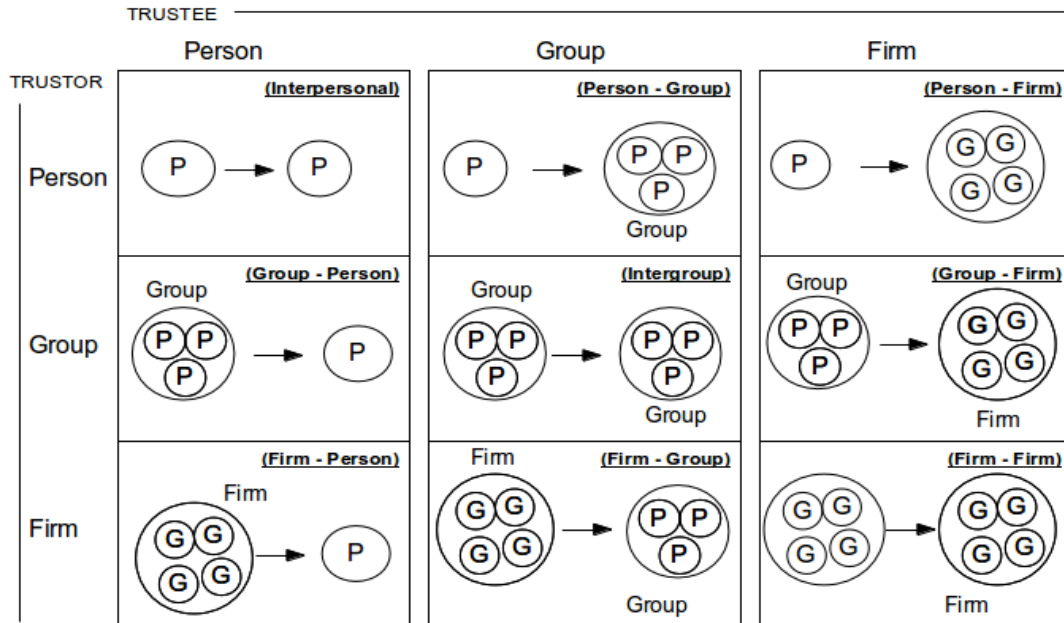
Figure 5.26: Individual and Institutional trust relationship
Source: Curral and Inkpen (2006)

As part of a typology for trust research Li (2014) refers to the *sense-giving* aspects of the trust context (See Table 5.2). These are the more formal structures (governance and group norms as an example) that provides trust signals. Approaching institutional trust cannot exclude the personal *sense-making*. But as this table indicates, the broader institutional environment introduces both task-orientated and people-orientated aspects. This study approaches the case environment in this manner recognising this broader perspective.

One cannot divorce the relationship between the institution and the individuals that collectively make up that the institution. It is not only the person-group-firm interaction that is important, but also the context. Embedded trust relationships are not only formed on an institutional level or only on a personal level, but a combination of these. Discussions around trust relationships have to consider both the micro and the macro view of trust; the individual, organisational and institutional. The relationships are also influenced by increased efficiencies, sharing of costs and risks and accessing new resources (Cuganesan, 2007). *This implies a multi-channel approach to trust*. Technology structure is an added layer (Kim *et al*., 2004) and forms an important force in the institutional relationship (Vosselman, van der Meer & Kooistra, 2009). Trust is not only placed in the technology but also in other aspects of the relationship. Guenzi, Johnson and Castaldo (2008) indicate that trust is place in the store, the salesperson and the product.

Table 5.2: A tentative typology of context for trust research and beyond
Source: Li (2014:84)

Two dimensions of contextual functionality	Sense-giving (contextual effect: action-orientated)		Sense-making (contextual effect: perception-orientated)
Resource pool (contextual source: task-oriented)	Cell 1: Natural system Economic system Technological system		Cell 3: Traditional custom Cultural value (Job-related)
Game Rule (contextual source: people-oriented)	Cell 2: Legal system Political system Social system		Cell 4: Cultural value (Exchange-related) Ethical norm Philosophical assumption

Trust plays a vital role in establishing and retaining relationships between trading partners whether it is based on trust or a structured relationship (Bachmann, 2001). Institutional trust is reliant on institutional embeddedness of these power structures (Lahno, 2002; Zucker, 1986). Benevolence between organisations will often take the form of benevolent relationships between their representatives, whose job-related interactions have been overlaid by social relations (Granovetter, 1985; Riegelsberger *et al.,* 2005). The trust signals that the organisation sends out are either through its representatives (boundary spanners) or through its broader collective activities. Increased routine interaction between individuals in the organisations is thus a key part of creating long-term trust between organisations. Yet the organisation guides the activities of the individual in a recursive manner by providing structure to the activities influences behaviour of the individual to act in a certain manner. Regardless of the macro developments, change still originates from the micro (Orlikowski & Gash, 1994). The organisation forms part of the eco-system and as such creates the trust perceptions of the system. *The level of the actor's interaction is thus of vital importance when looking at institutional trust relationships.* Exchange relationships are calculus-based (individual) underwritten by institutional embeddedness (Rousseau *et al.,* 1998).

The following section looks more closely at the Giddens' view on trust.

5.5 Giddens on trust

Returning to trust as part of the structuration discussion. The concept of abstract systems is an important component of institutional trust formations. The "... nature of modern institutions is deeply bound up with

the mechanisms of trust in abstract systems." (Giddens, 1990:83). According to Giddens (1990), abstract systems are different to that of personal trust. The "access points" between the institutional and the actor, the facework opportunities, is where the trust perceptions of trustworthiness are created. Giddens (1990) distinguishes between physical (facework commitments) and distant interactions (faceless commitments).

> "My overall thesis will be that all disembedding mechanisms interact with re-embedded context of action, which may act either to support or to undermine them; and that faceless commitments are similarly linked in an ambiguous way with those demanding facework." (Giddens, 1990:80)

Within structuration, the physical interaction between actors and the faceless commitments are seen to both create trust through the ultimate *context of action* (Giddens, 1990). Again, action plays a critical role. Trust placed in abstract systems does not pre-suppose any prior encounters at all with the other party (Giddens, 1990). Not only are these interactions between the actor and the abstract system part of trust forming, but so too are the interaction between actors within the abstract system (Giddens, 1990). Underlying trust in abstract systems is trust in the expertise of the other party (expert systems). This expert knowledge creates the "universe of events, as a result of the continual reflexive implementation of that very knowledge." (Giddens 1990:84).

In Giddens (1990:32) 10 elements are listed surrounding trust:

- Trust is related to absence in time and in space. There would be no need to trust anyone whose activities were continually visible and whose thought processes were transparent, or to trust any system whose workings were wholly known and understood. It has been said that trust is "a device for coping with the freedom of others," *but the prime condition of requirements for trust is not lack of power but lack of full information.*

- Trust is bound up, not with risk, but with *contingency*. Trust always carries the connotation of reliability in the face of contingent outcomes, whether these concern the actions of individuals or the operation of systems. In the case of trust in human agents, the presumption of reliability involves the attribution of "probity" (honour) or love. *This is why trust in persons is psychologically consequential for the individual who trusts: a moral hostage to fortune is given.*

- Trust is not the same as faith in the *reliability of a person or system*; it is what derives from that

faith. *Trust is precisely the link between faith and confidence* and this distinguishes it from "weak inductive knowledge." The latter is confidence based upon some sort of mastery of the circumstances in which confidence is justified. All trust is in a certain sense blind trust!

- We can speak of trust in symbolic tokens or expert systems, *but this rests upon faith in the correctness of principles of which one is ignorant,* not upon faith in the "moral uprightness" (good intentions) of others. Of course, trust in persons is always to some degree relevant to faith in systems, but concerns their proper working rather than their operation as such.

- At this point, we reach a definition of trust. Trust may be defined as *confidence in the reliability of a person or system, regarding a given set of outcomes or events,* where that confidence expresses a faith in the probity or love of another, or in the correctness of abstract principles (technical knowledge),

- In conditions of modernity, trust exists in the context of (a) the general awareness that human activity including within this phrase *the impact of technology upon the material world is socially created*, rather than given in the nature of things or by divine influence; (b) the vastly increased transformative scope of human action, brought about by the dynamic character of modern social institutions. The concept of risk replaces that of fortuna, but this is not because agents in pre-modern times could not distinguish between risk and danger.

- *Danger and risk are closely related but are not the same.* The difference does not depend upon whether or not an individual consciously weighs alternatives in contemplating or undertaking a particular course of action. What risk presumes is precisely danger (not necessarily awareness of danger, A person who risks something courts danger, where danger is understood as a threat to desired outcomes. Anyone who takes a "calculated risk" is aware of the threat or threats which a specific course of action brings into play. But it is certainly possible to undertake actions or to be subject to situations, which are inherently risky without the individuals involved being aware how risky they are. In other words, they are unaware of the dangers they run.

- Risk and trust intertwine, trust normally serving to reduce or minimise the dangers to which particular types of activity are subject. *There are some circumstances in which patterns of risk are institutionalised,* within surrounding frameworks of trust (stock-market investment, physically

dangerous sports). Here skill and chance are limiting factors upon risk, but normally risk is consciously calculated. In all trust settings, acceptable risk falls under the heading of "weak inductive knowledge," and there is virtually always a balance between trust and the calculation of risk in this sense. What is seen as *acceptable risk* - the minimising of danger - varies in different contexts, but is usually central in sustaining trust. Thus traveling by air might seem an inherently dangerous activity, given that aircraft appear to defy the laws of gravity. Those concerned with running airlines counter this by demonstrating statistically how low the risks of air travel are, as measured by the number of deaths per passenger mile.

- Risk is not just a matter of individual action. There are "*environments of risk*" that collectively affect large masses of individuals in some instances, potentially everyone on the face of the earth, as in the case of the risk of ecological disaster or nuclear war. We may define "security" as a situation in which a specific set of dangers is counteracted or minimised. The experience of security usually rests upon a balance of trust and acceptable risk. In both its factual and its experiential sense, security may refer to large aggregates or collectivities of people-up to and including global security-or to individuals.

- The foregoing observations say nothing about what constitutes the opposite of trust - which is not, I shall argue later, simply mistrust. Nor do these points offer much concerning the conditions under which trust is generated or dissolved;

Remoteness, calculations of probability and expectation form the key concepts of trust. Firstly, there has to be an object or reason for a trust relationship. Remoteness removes the trusting party from the actions of the trusted party and introduces the possibility that the actual outcome could not match the expected outcome. Figure 5.27 provides a summary of how the relationship between the institution (market) and the participants in that market are facilitated through self-service. Participants engage and form trust perceptions based on the various signals that they receive from the institutional environment. Participants in the market have certain expectations that are informed by both personal and institutional perceptions. As these participants interact with the institution, these perceptions are constantly shaped and adjusted.

The section above illustrate trust's role within structuration as well as its role in enacting social structures. Self-services act as a symbolic layer to replace physical trust-forming signals.
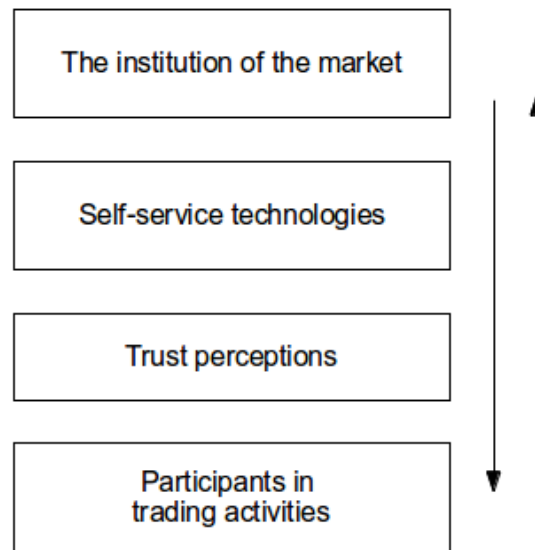
Figure 5.27: Relationship between the institution and actors

5.6 Stratification: incorporating trust signals

Stratification forms an integral part of structuration. Duality of structure seems to be more prominent in discussion than stratification. But at the heart of the interaction, terms like "memory traces", "virtualness", reflexive monitoring, knowledgeability, all takes us back to stratification.

Institutional trust (and the structures it represents) has its origins in human action and stratification offers us a model of this process. Although the definition of actor has been suggested to include broader groups, the individual is seen as originator and ultimate catalyst towards the functioning and presence of structures. As legal entities, organisations does provide the perception of agent/agency, but "… it takes human agents to interpret laws as well as to frame them in the first place." (Mendoza, 1997a:228). The individual is key to understanding structuration and within this framework the actor as an individual is the originator and the ultimate receiver of trust signals. Regardless of how broad one sets the definition of the trusting party, the individual is never removed from it.

> "…institutional-based trust, from our point of view, are phenomena that manifest themselves in *an active decision by one party to rely on another party under conditions of risk.*" (Bachmann, 2011:10, *own emphasis*)

With the individual established as starting point one can move onto the trust as an attribute of the individual and look at the process of stratification with trust playing a role in the evaluation of future actions (See Figure 5.28). Walczuch and Lundgren (2004) indicates that trust on a personal level consists out of 5 typical trust types; personality-based, perception-based, attitude-based, experience-based and knowledge-based. As part of an actor's recursive monitoring, trust plays an underlying role of these. Knowledge and experience all contribute to building schemas the actor draws on to form trusting perceptions. Especially if this is part of a routinized interaction where the same trust perceptions are affirmed, these trust structures are institutionalised as part of the broader institutional interaction.

There are clearly identifiable stages that forms part of a commercial transaction. Apart from this progressive nature of trust formation (Range & Leonard, 2014), the actor forms trusting beliefs and intentions based on personal factors. There is constant, in some cases, routine interaction with the institution which has the potential to embed trust perceptions into institutional structures.

The interaction of the actor with the system is assumed to involve the processing of signals (reflexive monitoring. Figure 5.28 presents the incorporation of trust signals as part of the stratification process. The inclusion of trust signals indicates the effect on the decision process of the actor as part of the stratification model. Building on the discussion surrounding trust on a personal level, trust is formed within the context of the individual actor.

> "Through the reflexive monitoring of action agents are able to monitor the flow of their activities and the contours of the contexts in which they move." (Willmott, 1997:170)

Rationalization of action is the discursive process through which decisions are evaluated. Subconscious motivation of action is recognised as playing a role and is left included in the model. The unconscious is important as it is the primary source of a basic security system (Willmott, 1997) influencing activity.
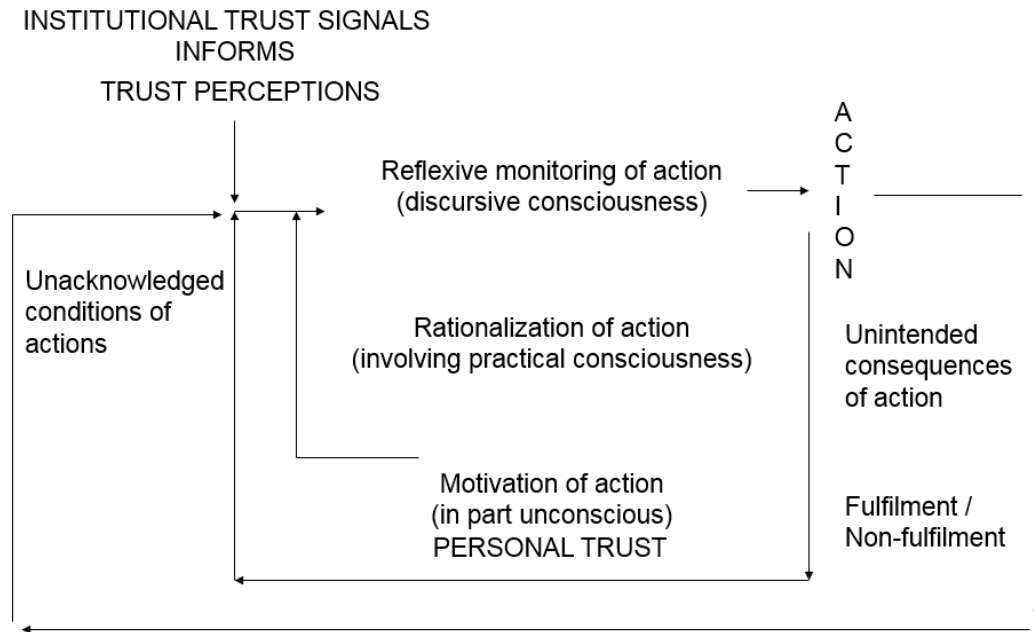
Figure 5.28: Stratification incorporating trust signals
Source: Adapted from Giddens (1984)

Unacknowledged conditions of action emerges as those factors that cannot be anticipated or defined but that could have an impact on the decision making of the actor. It is those factors that are inherent "…in the agency of other purposive agents in whose knowledgeability these structures are recursively implicated." Mendoza (1997:237).

Stratification acknowledges that the actions of the actor has an effect on the broader environment and (reflexive monitoring). This input-output-input approach is used as a basis for the actions of the actor within the conceptual framework. The following section looks at various characteristics of trust.

5.7 Characteristics of trust

When viewed as an individual construct, the psychological aspects of trust play a dominant role in decision-making (Rotter, 1967). As discussed above, trust at the level of the individual (the micro level) should be the starting point for understanding the dualistic nature of trust (Zucker, 1986). Trust plays a direct role through embedded relationships as it assigns a value to a transaction and enriches the pool of social capital of the participants in a network (Uzzi, 1996). The concepts presented by Mayer *et al.* (1995) as ability, integrity and benevolence and Tan and Thoen's (2001) concepts of party and control trust are

widely used as characteristics of trust relationships (Riegelsberger *et al.,* 2005).

- Benevolence refers to the level that the trustee takes the potential benefit of the trusting party into consideration (Lee & Turban, 2001);

- Integrity/Honesty refers to the trustee honouring the terms of the agreement (Siau & Shen, 2003);

- Ability/Competence refers to ability of the trustee to deliver the expected result (Salo & Karjaluoto, 2007);

- Predictability refers to how much the anticipated actions of the trustee can be predicted from past behaviour (Salo & Karjaluoto, 2007).

Corritore *et al.* (2003) define the perception of trustworthiness as being dependent on the attributes:

- Honesty: internalised norms and expertise can be linked to the property ability;

- Expertise: ability;

- Predictability: institutional embeddedness;

- Reputation: social embeddedness.

Ability (expertise) strengthens the *perception* that the merchant is seen as competent to deliver on promises and satisfy the customer (Corritore *et al.*, 2003). Benevolence implies that the trustee takes the truster's benefit into consideration (Lee & Turban, 2001) and is a "... intrinsic gratification from the truster's well-being and his company" (Riegelsberger *et al.*, 2005). Benevolent relationships are characterised by identification-based and knowledge-based trust (Rousseau *et al.,* 1998; Koehn, 2003). Riegelsberger *et al.* (2005) refer to integrity as "internalised norms", which refer to the specific value system of the truster and may or may not be explicit. Honesty, credibility, reliability and dependability are examples of integrity measures (McKnight & Chervany, 2002). Another important element is reliability. Will the other party perform as expected and will he do so continuously (Zaheer *et al.*, 1998)? Reliability can only be measured over time through routine interaction and adjustment of expectations.

Lewicki and Bunker (1995) approach trust as a set of rewards and punishments that guide the other's behaviour (i.e. calculus-based trust), predictability of behaviour (i.e. knowledge-based trust), or a full internalisation of the other's desires and intentions (i.e. identification-based trust). Priem and Weibel

(2012) indicate that the behavioural approach seems more accurate as trust involves a broader, less quantifiable set of criteria. Trust is understood to be a learning process. When trust is approached from a behavioural perspective, the social context starts to play a role and detail becomes more important (Priem & Weibel, 2012). The historic relationship between truster and trustee (temporal embeddedness), risk (Das & Teng, 2001) and institutional and domain specific factors all play a role when one views trust as behavioural. Building trust is a subjective activity and takes place during interaction with other individuals as the individual suspends uncertainties, risk and ignorance (Breeman, 2012). A "leap" of trust has to be taken by the trusting party. Thus, trust establishment involves both the interpretation of the trust situation and the suspension of that which would prevent the trusting party to engage.

Two belief effects form the basis of the trust in systems (viewed as abstract systems), namely situational normality and structural assurance. Situational normality refers to the perception that the environment is in order and that a positive outcome is possible due to this (Baier, 1986; Lewis & Weigert, 1985). It also includes the situation where one has comfort in the other party's role. As one perceives other users consuming the same service one can expect that perceptions of trust will be met. *Thus, situational normality will lead to a trusting intention.*

Structural assurance refers to the collection of assurance measures such as contracts, agreements, governance structures, policies, rules etc., which provide a structure that the truster can trust (Shapiro, 1987; Zucker, 1986). The legal and technological safeguards as perceived by individuals are a key component to institutional-based trust (McKnight *et al.,* 2002). Assurance structures are an antecedent of trust (Cheskin, 1999).

Trusting beliefs are influenced by structural assurances via:

- Situations that are functioning within a *regulated environment* increase the perception that the individuals within that environment are also more trustworthy.

- The structures also reflect the actions of the individuals who are active within the structures and signals the levels of trustworthiness.

If one believes that the other party is "benevolent, competent, honest and predictable", it forms a trusting intention leading to trusting behaviour. Figure 5.29 demonstrates how the various trust constructs as listed above, combine to form trusting behaviour that represents action.
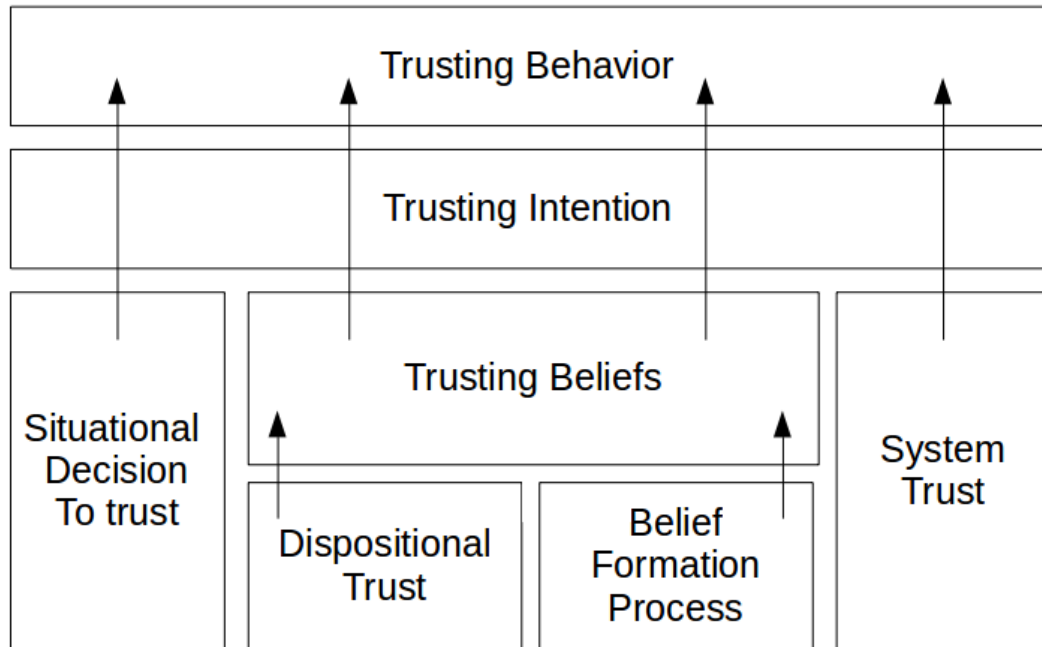
Figure 5.29: Relationship amongst trust concepts
Source: McKnight and Chervany (1996:86)

Perceived trustworthiness itself has been shown not to be a proxy for trust (Gillespie, 2012). The term 'perceived' is important, as the actual trustworthiness of the other party cannot be accurately measured. Holding beliefs about another's trustworthiness does not incur risk only the actions it informs. Trustworthiness is only relevant as far as it influences the trust decision (Gillespie, 2012). The behavioural cues are processed differently by different trusting parties through different perceptual lenses and situational factors (Priem & Weibel, 2012). Recommendation can serve as a reverence point for determining the trustworthiness of an entity (Kohlas, Jonczy & Haenni, 2006). However, as Kim *et al.* (2004) indicate, cognitive dissonance dictates how the direct experience overshadows other trust building factors. A misalignment of trust perceptions introduces distrust.

> "Given that humans are social beings, most will find other social and cognitive factors that are more pertinent to a trust decision than their own disposition. Thus, users' cognitive and calculative processes and subjective norm may have overcome their personal trust tendency." (Li *et al.,* 2008:57)
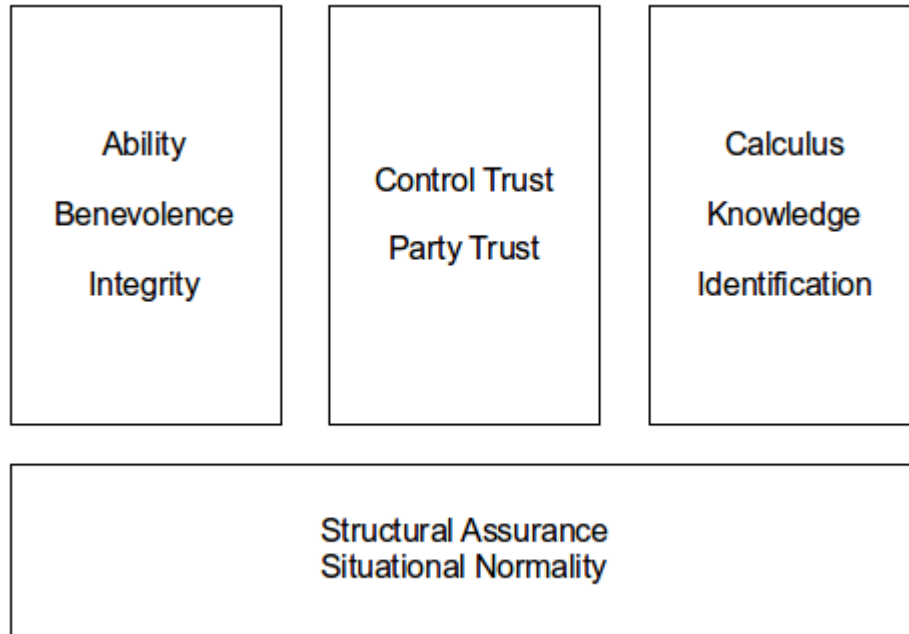
Figure 5.30: Collection of Trust Concepts
Source: Xi et al. (2008), Corritore et al. (2003), Koehn (2003)

Li *et al.* (2008) places the emphasis on cognitive and calculative aspects of trust-forming behaviour. It is argued that these aspects are easier to manipulate than the broader institutional factors and specific personality traits.

> "The cognitive component of organizational trust refers to an evaluative belief and usually a certain extent of experience and knowledge about the other actor. Cognition-based trust is founded on evaluative predictions and calculations, such as the probability of the reciprocal behaviour of the other party." (Pucetaite, Lämsä & Novelskaite, 2010:199)

Provisioning of services from a technology point of view needs to consider this aspect by focussing on the singular transaction and on the processes surrounding, preceding and following the transaction. Trust can also be classified as "swift trust" (Jarvenpaa, Shaw & Staples, 2004; Meyerson, Weick & Kramer, 1996) where the transaction is only established for that brief moment in time and 'identity-based trust' (Lewicki & Bunker 1996) is not available. Having identified the various characteristics of trust on a personal level (See Figure 5.30), another important aspect that plays a role in institutional relations namely risk.

Within transactional environments, the asymmetrical nature of these relationships creates the opportunity for opportunistic behaviour and hence creates a certain level of risk to the parties involved. Trust mitigates the risk of transactions online (Lee & Turban, 2001; McKnight & Chervany, 2002). From the literature, the one element common to trust discussions is the predictive nature of trust-forming behaviour to mitigate risk. Predictability of potential risk affects action.

Trust should be:

> "... understood specifically in relation to risk, a term which only comes into being in the modern period: The notion originated with the understanding that unanticipated results may be a consequence of our own activities or decisions, rather than expressing hidden meanings of nature or ineffable intentions of the Deity." (Giddens, 1990:30)

Luhmann (1979) sees risk as a prerequisite of trust. As with defining trust, defining risk is challenging. Various authors have linked trust and risk only in situations where risk is present (Corritore *et al.*, 2003; Lewis & Weigert, 1985; Mayer *et al.,* 1995). Giddens (1990) indicates that in the presence of accurate predictions of the trustee's actions, trust would not be so important.

Figure 5.31 indicates the interaction between trust and risk. Individuals are in an initial state and are confronted with various reasons for and against engaging in a trust relationships. The various signals the individual receives affect their trusting beliefs and ultimately their trust decisions. Whatever the risk perceptions are, trusting involves the suspension of risk as part of the trust act.

Returning to the definitions of trust, one can certainly deduct elements of risk within the definitions, such as an uncertain outcome, which is dependent on another party who has the opportunity not to honour the agreement. These are all aspects that indicate an inability to affect personally a desired outcome.

> "... trust will only be required if there are things at stake and if there is the possibility of adverse outcomes." (Riegelsberger *et al.,* 2005:385)

> And

> "Uncertainty and hence the need for trust arises from the fact that trust-warranting properties are only indirectly observable via signals, which may be unreliable." (Riegelsberger *et al.,* 2005:390)
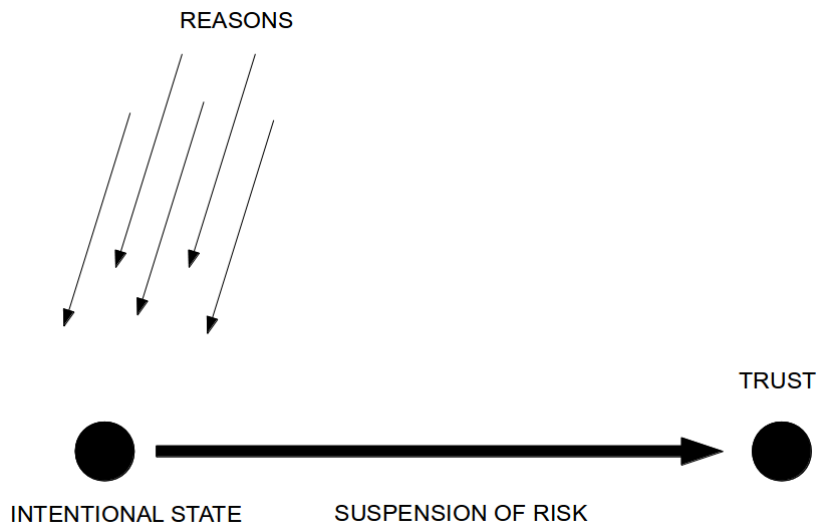
Figure 5.31: Trust establishing process
Source: Breeman (2012)

Strong trust relationships reduce perceived risks, which in turn reduces the perceived transaction costs of doing business. The *complexity of the online environment* means that the trustee does not have the ability to calculate true perceptions and probabilities of risk before transacting. The complexities are avoided by simply creating a "risk" perception rather than an accurate calculation of probabilities (Riegelsberger *et al.*, 2005). Risk and specifically perceived risk is grounded in the broader social (and institutional) context of the transactional environment (Gefen, Karahanna & Straub, 2003; Mayer *et al.,* 1995; Mitchell, 1999). The irony is that users however tend to place trust in online vendors regardless of the risk associated with online environments (Riegelsberger *et al.,* 2005). Individuals pay before receiving a product for instance and it is the broader contextual environment that delivers signals to trusters that influences trusting behaviour. Thus the trust process involved uncertainty, but the uncertainty and the accompanied risk, do not prevent the transactional process (Doney & Cannon, 1997) in certain settings.

One method of reducing perceived risk in the online environment is to increase the level of information. Increasing upfront disclosure has been shown to build trust (Cheskin Report, 1999; Shneiderman, 2000). The quality of information directly affects the level of uncertainty and risk. As indicated, risk plays a key role in the level of trust antecedents. Information collected from previous encounters informs subsequent actions and so reduces perceived risk (Young-Ybarra & Wiersema, 1999). This recursive process is also

subject to a progressive element in that trust's intensity is linked to the specific nature of the transaction. The following section looks at this aspect as part of progressive trust.

5.8 Progressive nature of trust

As users engage with the institutional environment, distinctly different stages of engagement can be identified, each posing a different perceived level of risk. The design of self-service systems has to consider this progressive trust variation. For example, when trust intensity is high, communication levels have to be high (more frequent and in detail). Assurance of product movement and quality related aspects have to be provided pro-actively rather than waiting for the customer to request it.

For example, using the general search facility in the self-service solution carries a different level of potential risk than filling in personal credit card details and committing to a transaction. As the actor engages with the market environment, various distinct phases can be identified.

Table 5.3: Proposed stages of trust
Source: Adapted from Mills and Morris (1986) and Schultz (2006)

PROPOSED PHASES	Mills and Morris (1986)	Schultz (2006)
SEARCH PHASE	Pre-encounter	Preceding phase
PRE-TRUST	Initial Encounter	Preceding phase
ACTION TRUST	Initial Encounter	Trust situation
POST TRUST	Decoupling	Subsequent phase

Initially a search phase in entered where general information of the market is scrutinised to identify opportunities. Trust has a facilitating role in relationships through its inherent reduction of perceived uncertainty (McKnight & Chervany, 2002). McKnight *et al.* (1998) offers three scenarios under which initial trust intentions could be fragile:

- Inadequate support for the antecedents;

- The assumption based nature of antecedents;

- High perceived risk.

Canavari *et al.* (2010) offers the following example of stages identified within the fresh produce context:

A buyer at a Dutch food specialities wholesale company who is always on the lookout for new procurement opportunities follows the following steps:

> "… scout market/fairs; sample taking and testing; if ok then; check on the firm (e.g. certificates or audit); if ok then; make specifications for the product; if ok then; agree on price, quantities, dates; if ok then; buy." (Canavari *et al.,* 2010:323)

Within this example, one can see the progressive nature of the engagement. As the consumer narrows in on the potential service providers, further assurance is sought (formal institutional signals such as "certificates"). Initial trusting beliefs and intentions (Mayer *et al.* 1995) inform the truster's actions through the search and identification of potential service providers. Once an opportunity is identified, further engagement is made with the other party to negotiate the terms of the transaction.

A disposition to trust is an important predictor of an individual's trust levels (McKnight *et al.,* 1998). Priem and Weibel (2012) provide a trust decision process and indicate that this decision context is largely invisible. This involves decision input, a non-observable decision on trust and decision-based manifestation (Priem & Weibel, 2012). This is termed the pre-trust phase (Range & Leonard, 2014). During this stage, the various formal institutional assurances are sought. During the pre-encounter phase, various expectations and value judgements are formed by the truster. In Mills and Morris (1986), aspects such as role expectations (observation, participation, imitation), predispositions and role enactment are listed as initial activities that inform these expectations. Schultz (2006) refers to a "proceeding phase" in which the truster determines the trustworthiness of the trustee. Mills and Morris (1986) refer to the search activity and highlight the high-level of interplay between the truster and trustee in creating initial perceptions.

> "... even before a prospective client actively searches for a service, he or she may have some picture of the service the organisation has to offer and the role he or she is to perform in the production of service inputs." (Mills & Morris, 1986:729)

According to Mills and Morris (1986), the initial encounter is characterised by negotiation and role related activities (role acquisition, role determination and role making). Schultz (2006) refers to this as the "trust situation" in which the truster forms a perspective of how trustworthy the trustee is. A transactional

commitment defines the critical action a trusting party has to perform to show a commitment to a transaction. It is important to note that commitment or non-commitment to the transaction should not be attributed to elements of trust behaviour alone.

Once the trusting party consumed the service or product, a post-trust stage is entered into. Mills and Morris (1986) refer to the decoupling stage where both parties view the service as complete, whereas Schultz (2006) refers to a "subsequent phase" in which actual behaviour is observed and compared to the expected behaviour. Past experience is evaluated against the *ex ante* expectations. Positive affirmation leads to the strengthening of the trusting perceptions and negative affirmation on the other hand increases the perceived risk of an additional transaction. Figure 5.32 illustrates the dual nature of the services of agents offer to both the grower and the buyer. The manner in which these parties engage is not just a single trust interaction but are characterised by multiple potential interactions before a final transaction is concluded. Trust is also a matter of the post engagement, where the relationship continues to exist even after the transaction is concluded. The following section looks at the trust process.
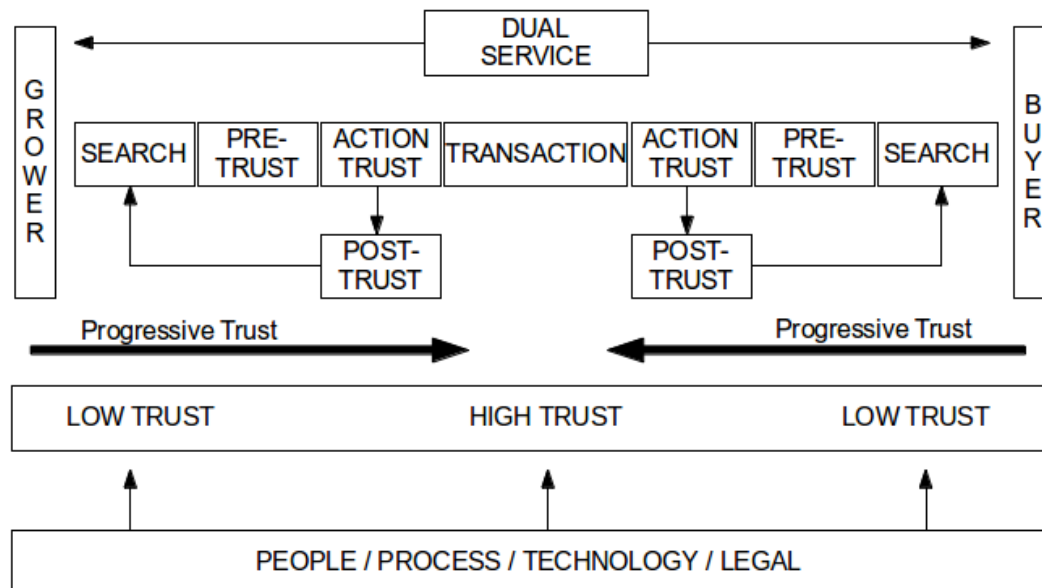
Figure 5.32: Progressive trust formation
Source: Range and Leonard (2014:3393)

5.9 The trust process

The basic model of Riegelsberger *et al.* (2005) describes the dyadic interaction between a truster and trustee. The model shows a trust transaction starting with the truster analysing the various signals from the environment (Figure 5.33). The truster either will perform a trust action or will simply withdraw from the transaction. If the truster performs the transaction, the trustee has either the position to fulfil the agreement or non-fulfilment. As time progresses, the interpretation of the signals are placed within a broader context of experience of past performance. The starting point of trust relationships is the individual (Bachmann, 2001).
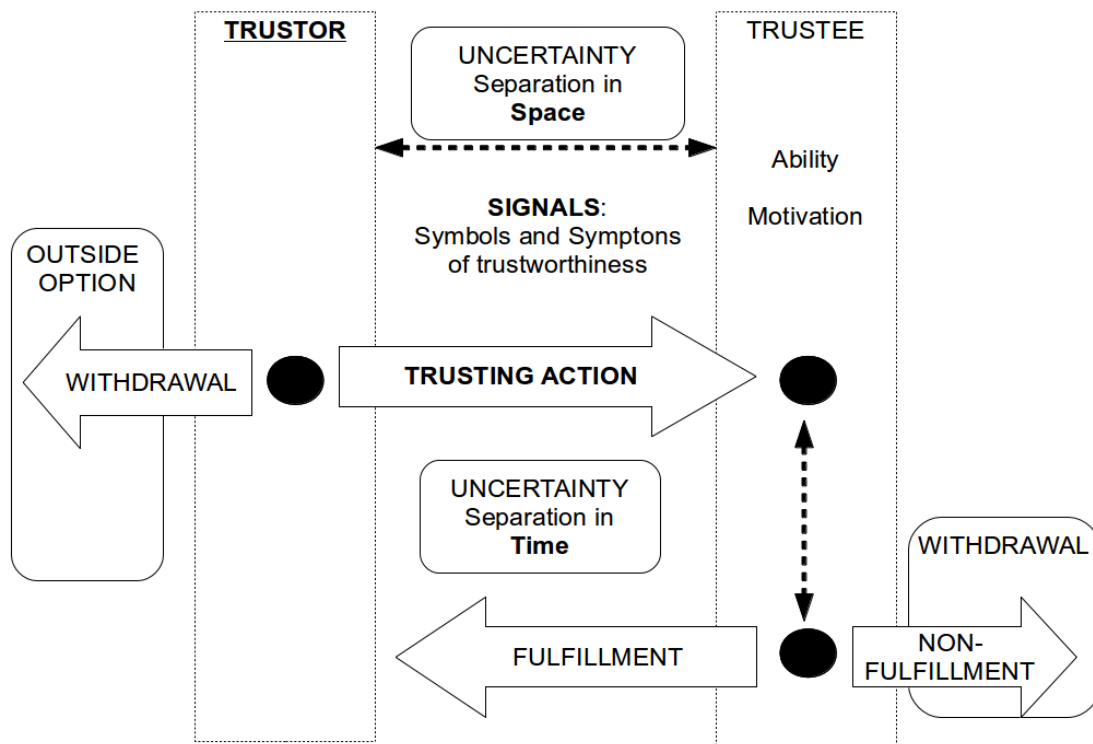
Figure 5.33: Basic trust interaction
Source: Adapted from Riegelsberger et al. (2005)

Riegelsberger *et al.* (2005) list specific contextual properties that influence the *ex ante* behaviour of the actor:

- Temporal embeddedness refers to the signals the organisation sends from an institutional and brand dimension. It links to other customers/partners and investments in the channel show longevity and

stability.

- Social embeddedness allows for the exchange of information about a trustee's performance among trusters. This information is reputation related and it is included in many models of trust, such as the ones by Corritore et al. (2003). From the perspective of these models, reputation is historic information about trusters' attributes such as honesty, reliability or dependability (McKnight & Chervany, 2000; Corritore et al., 2003). Social embeddedness, i.e. reputation therefore provides information about the vendor's intrinsic properties (e.g. ability, levels of integrity and benevolence). Other social embedded aspects are recommendations, customer feedback and reputation systems.

- Institutional embeddedness is the relationship between factors that provide the contextual measures for the user. The broader the distance the more important the role of trust to seal programs (Cheskin, 1999). It entails establishing rules of conduct (e.g. with regard to security technology or privacy policies) and checking their members' performance against these rules. Riegelsberger *et al.* (2005) indicates the importance of trust in the certification body itself. For example, Amazon's zShops where the intrinsic properties can be gathered from mission statements, privacy policies, disclosure of terms and conditions and costs (e.g. shipping). However, these signals are symbolic and can easily be mimicked by untrustworthy vendors at a relatively low cost. This entails communicating internal norms through privacy statements. Benevolence could further be communicated by a returns policy.

Again, trust action represents a critical point within the trust relationship. It is at this point that we find expression of the explicit wishes of the participant (Wang & Emurian, 2005). The trust action provides a direct expression of the intention of the trustee (Mayer *et al.*, 1995). Prior to a trust action, we can simply speculate about behaviour based on the past actions of the individual or the collective.

> "Through this "leap of faith" trust transforms fuzzy uncertainty (where anything is possible) into the specific assessable risk (of betrayal) that a trustor is prepared to accept and thus creates opportunities for interaction which might otherwise not exist." (Bachmann & Inkpen, 2011:8)

The trust act transfers power to the other party and makes the trustee reliant on outcome of the trusted party's actions (Gambetta, 1998), as when the trustee exposes themselves by divulging information or

handing over money to the other party (McKnight & Chervany, 2002). The trust action generates data from which we can gather specific signals about the context of the trust act. At the extreme end, social theorists' approach is that trustworthiness can only be demonstrated in an environment where there are no assurances, binding agreements and no returns required (Molm *et al.,* 2000). This is an extreme view because trust is informed by *something*.

Riegelsberger *et al.* (2005) refers to two types of symbols that act as signals to prospective trusting parties:

- *Symbols of trustworthiness*. Symbols have an arbitrarily assigned meaning. They have been specifically created to signify the presence of trust-warranting properties. Examples of such symbols are e-commerce trust seals or uniforms. Symbols can be protected by either making them very costly or by sanctioning their misuse. To keep the cost of emitting symbols low for trustworthy actors, they are often protected by sanctions. Symbols are a common way of signalling trustworthiness, but their usability is limited. As they are created for specific settings, the truster has to know that they exist and how to decode them. At the same time, trustees have to invest in emitting them and in getting them known (Bacharach & Gambetta, 2003).

- *Symptoms of trustworthiness*. Symptoms are not specifically created to signal trust-warranting properties; rather, they are given off as a by-product of trustworthy actions. For example, the existence of a large number of customer reviews for a product sold on an e-commerce site can be seen as a symptom of a large customer base. Professionalism in site design and concern for usability has also been mentioned as symptoms of a professionally run and hence trustworthy company. Symptoms come at no cost to trustworthy actors, but need to be mimicked at a cost by untrustworthy ones.

The following section explores the concept of trust within an online world.

5.10 Selection of trust models

This section contains various trust models from the literature that represent different dynamics around trust environments. These were selected based on their description of the truster/trustee approaches, inclusion of the broader institutional context, use in electronic exchanges and the use of third parties. Each model is briefly summarised.

5.10.1 Generic trust model – (Tan and Theon, 2000)

The key contribution of the Tan and Thoen (2001) model is the introduction of a trust threshold formed by the interaction of party trust and control trust. The model distinguishes between trust in the other party and the relevant control mechanisms. As far as the governance of electronic exchanges is concerned, the model especially provides a valuable contribution to distinguish the context of the transaction from the various subjective elements informing it. The internal and external environments are incorporated to lead up to a trust threshold that determines trade. Recognising the roles that risk, expected gain, perceptions of trustworthiness and control mechanisms play in transactions, these elements can be explicitly incorporated in future models.
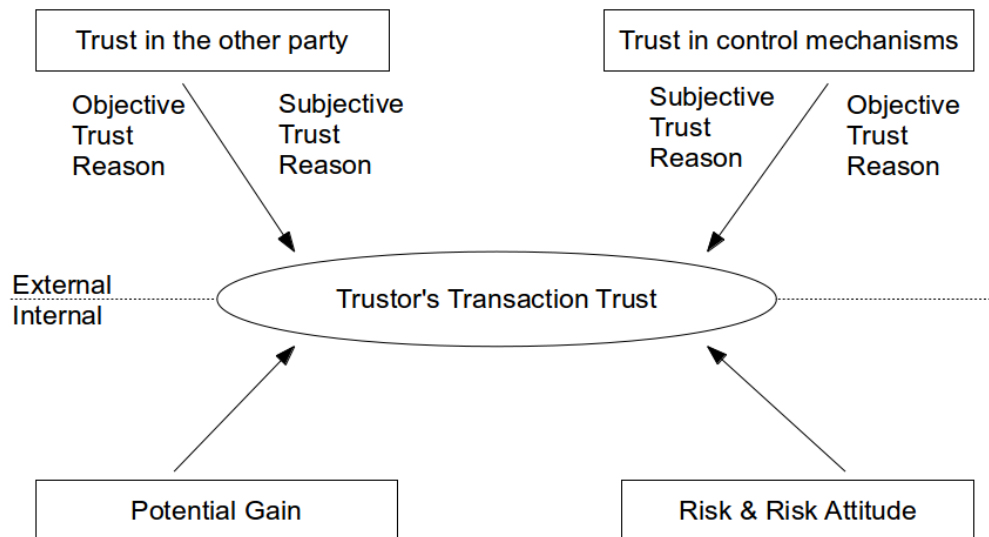
Figure 5.34: Generic trust model
Source: Tan and Thoen (2001:62)

5.10.2 On-line trust formation – (Corritore *et al*., 2003)

The Corritore *et al.* (2003) model presents an individual user's on-line trust forming towards a transactional or informational website. Aspects considered are perceptions of expertise, predictability and risk towards a website. It excludes aspects such as person-to-person communications (email, chat, instant messaging and entertainment). The model's value is that it directly focuses on the trust aspects of technical

interaction between the individual and the technology. External factors include both the physical environment and the psychological factors that inform trust perception in websites.
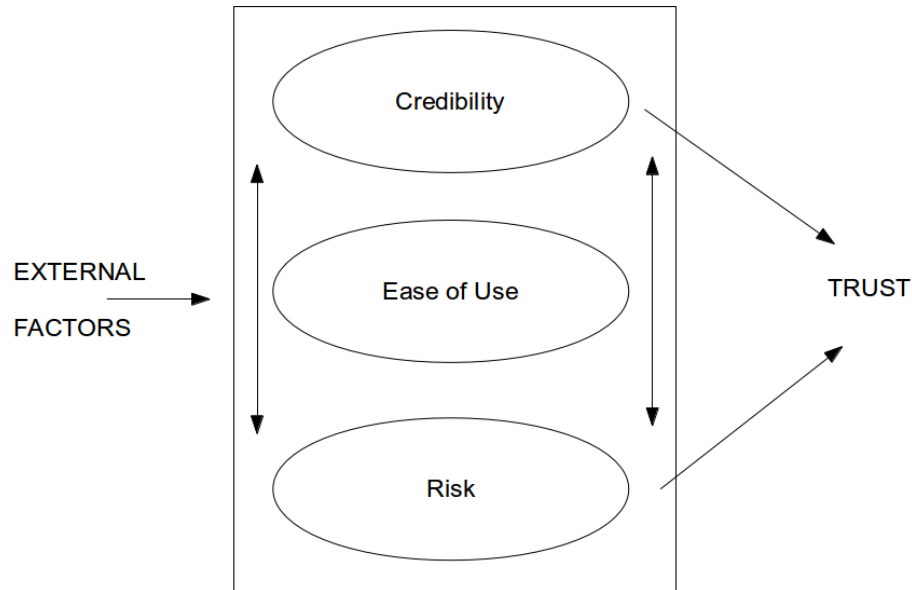
Figure 5.35: Model for on-line trust
Source: Corritore et al. (2003:749)

5.10.3 Trust-warranting contextual signals – (Riegelsberger *et al.*, 2005)

Riegelsberger *et al.* (2005) establishes the institutional aspects of trust and focusses on the role that institutional signals play in the trust process. Social, temporal and institutional aspects of truster and trustee relations are explained within an electronic exchange. Specifically how the contextual and intrinsic properties play a role in the behaviour of a trustee (Riegelsberger *et al.,* 2005).

The contribution of this model lies in the attempt to show how to signal these aspects using electronic communications. Aspects such as ability, benevolence and norms are communicated through signals (symbols and symptoms). Riegelsberger *et al*. (2005) focusses on the trustee and the signals that inform its perceptions. The model presents actual design aspects that could facilitate the practical application of the model.
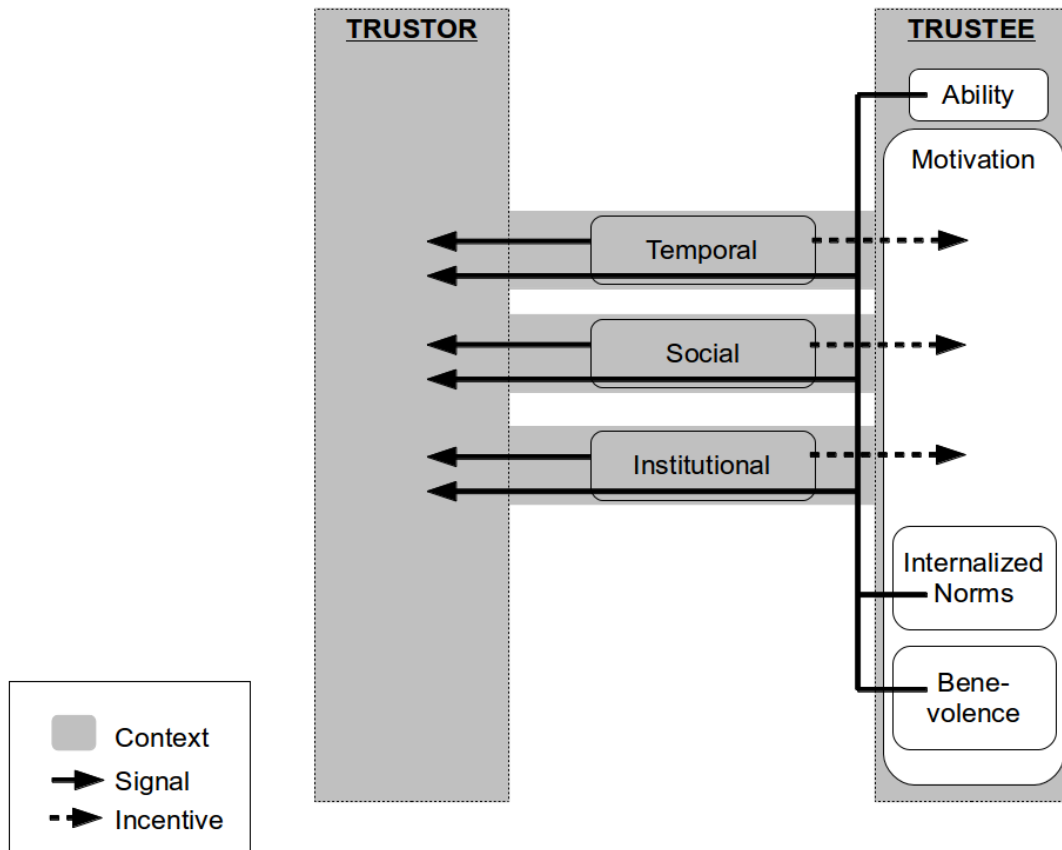
Figure 5.36: Contextual trust-warranting properties
Source: Riegelsberger et al. (2005:399)

5.10.4 Model of trust – (Mayer *et al*., 1995)

Mayer *et al.* (1995) approaches trust from the perspective of both the truster and the trustee. They list the following problems they aimed to solve with the model:

- The definition of trust itself;

- Lack of clarity in the relationship between risk and trust;

- Confusion between trust and its antecedents and outcomes;

- Lack of specificity of trust referents leading to confusion in levels of analysis;

- Failure to consider both the trusting party and the party to be trusted.

The model presents the characteristics of both trustee and truster and introduces perceived risk as an additional element in trust creation. It clearly differentiates between trust, the propensity to trust, the

causes of trust and the outcome of trust within a risk environment. Within a trust transaction ability, benevolence and integrity are three constructs that create certain states of perceived trustworthiness. Although the model is set in an organisational context, it is aimed at the individual level where perceptions of ability, benevolence and integrity inform trusting behaviour.
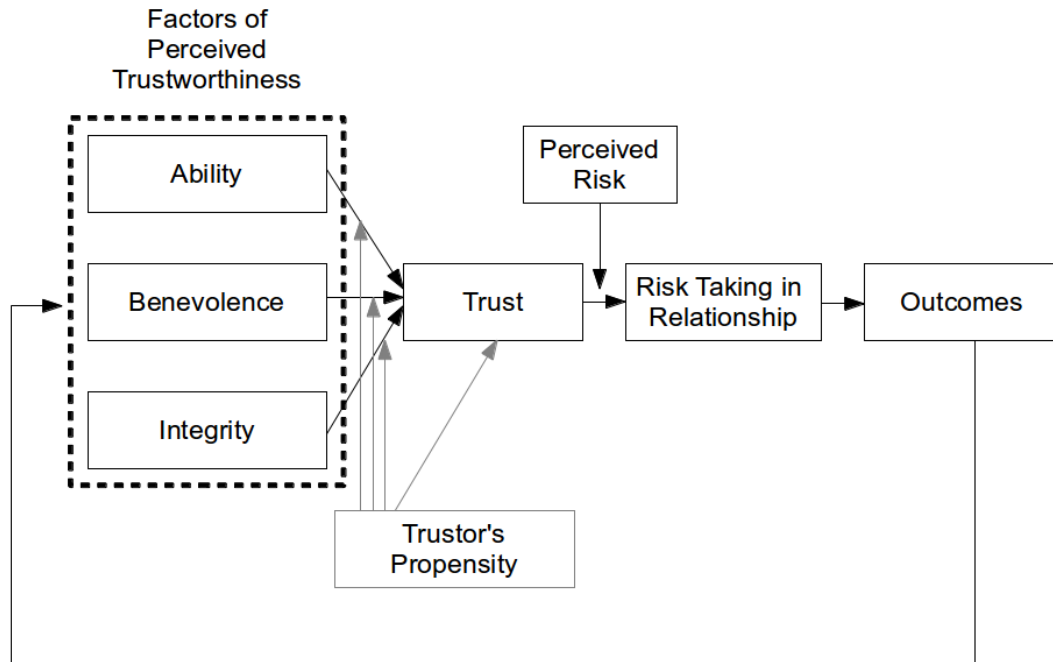
Figure 5.37: Model of trust
Source: Mayer et al. (1995:715)

5.10.5 Trust framework model – Schultz (2006)

Schultz (2006) provides a combination of sociology and psychology within one model. Firstly, basing this model on McKnight and Chervany's (2002) four trust constructs of disposition to trust, institution based trust, trusting beliefs and trusting intentions as its foundation. It illustrates trust as a result of cognitive and institutional forces. Schultz (2006) refers to the trust transaction as comprising three phases: the preceding phase, the trust situation and the subsequent phase.
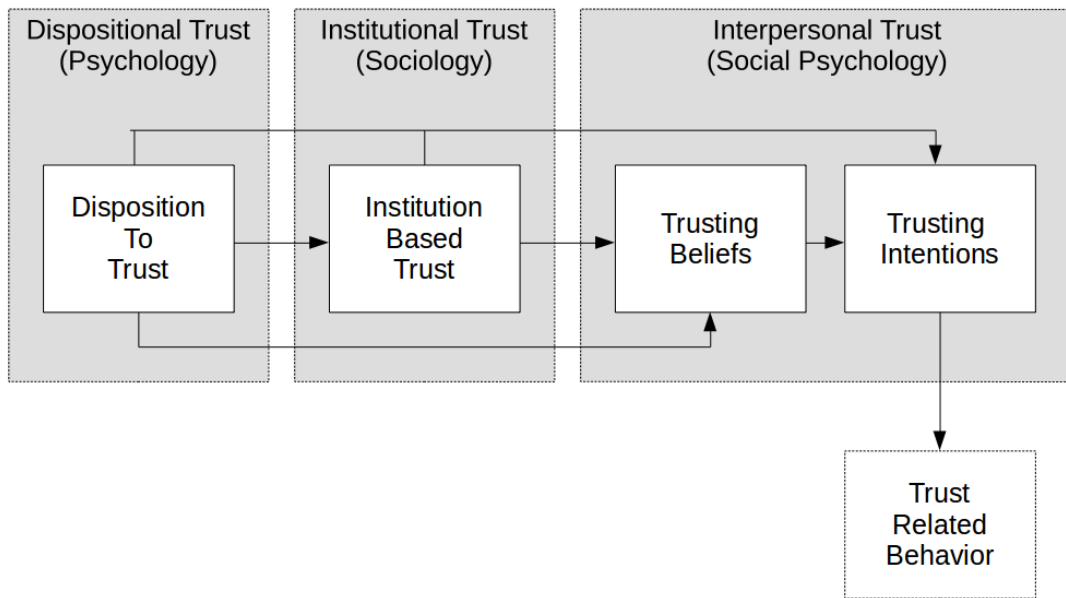
Figure 5.38: Interdisciplinary model of trust concepts
Source: Schultz (2006:2)

Extending the model to the communication and trust framework models, Schultz (2006) demonstrates the digitisation of the trust process and the subsequent communication of the trust action. The sender/truster translates the various trust forming factors into a low-level data layer, which is processed through the channel and re-encoded on the trustee's side. The contribution of the model lies in the description of the trust transaction embedded within a broader context. The preceding phase requires processing of data that is different from that required to function in the subsequent phase.
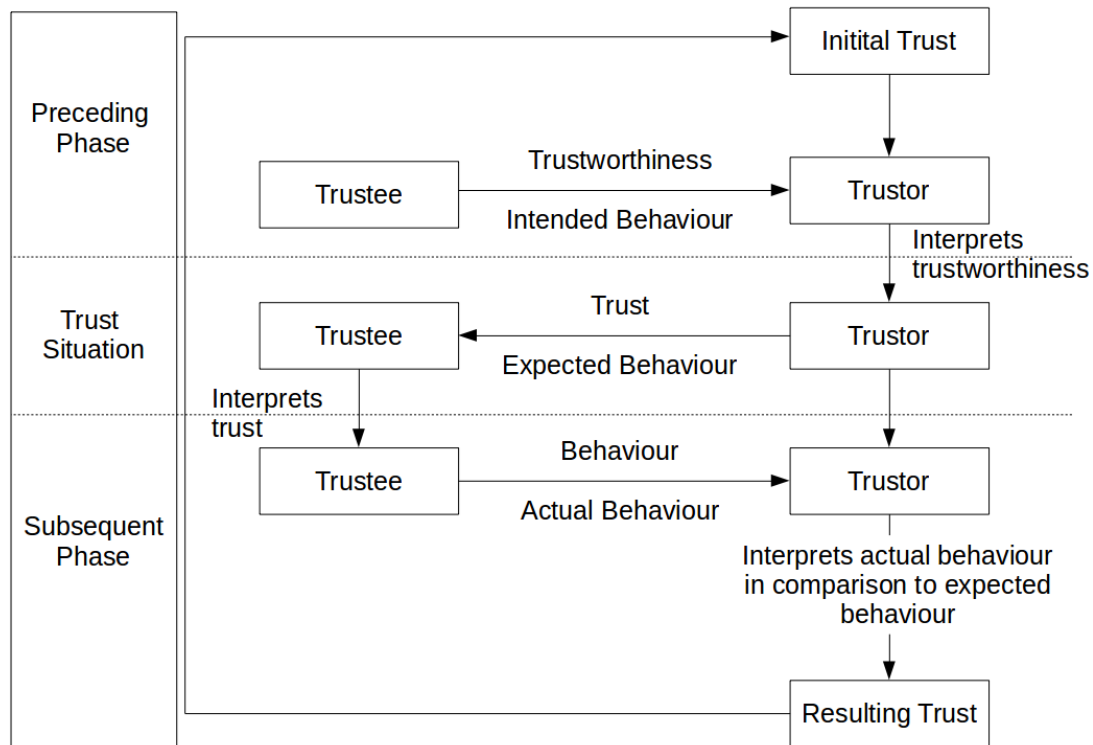
Figure 5.39: Trust transaction
Source: Schultz (2006:4)

Trust actions form the indicator of the level of willingness to trust. The trust action forms the base from which a trust process is build.

The processing of cognitive processes is important. A key aspect of SSTs lies in the ability of the technology to process these signals, encode and decode them in a meaningful way. The fact that this process needs to happen at different stages of the trust engagement is the key contribution made by Schultz (2006).

5.10.6 Online trust - Salo and Karjaluoto (2007)

The Salo and Karjaluoto (2007) proposes six internal and 12 external factors that have to be taken into account when approaching trust in online environments. The model focusses specifically on the trust aspects related to a typical web environment. Trust beliefs are influenced by a host of factors as illustrated that includes aspects like third parties, the specific product and specific markets.
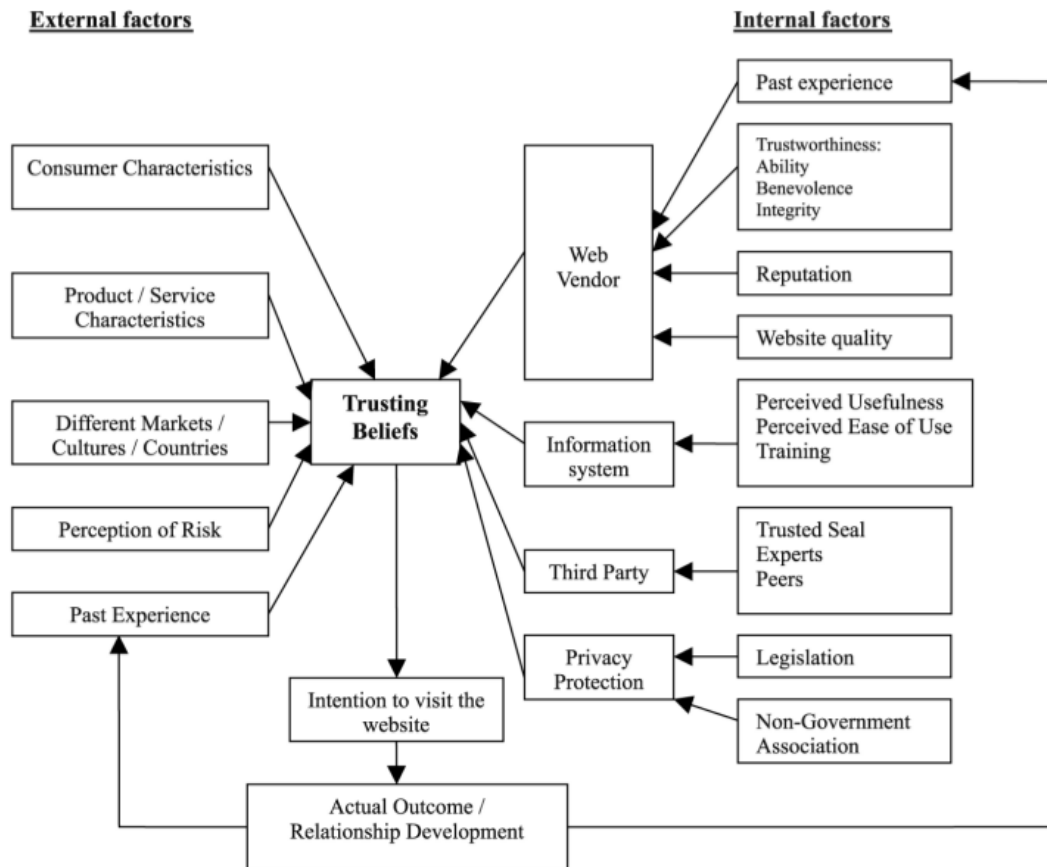
Figure 5.40: Research model for investigating online trust
Source: Salo and Karjaluoto (2007:616)

5.10.7 Trust in agri-food chains – Canavari *et al.* (2010)

Canavari *et al.* (2010) produce a model that focus specifically on the food industry. The model approaches trust in B2B exchanges from the buyer's side and differentiates between the product, market and supplier. The model also provides a list of trust related elements that could be operationalised. Although not tested in practise, the topology offers a practical framework that can be contrasted with the other models that focus on trust.
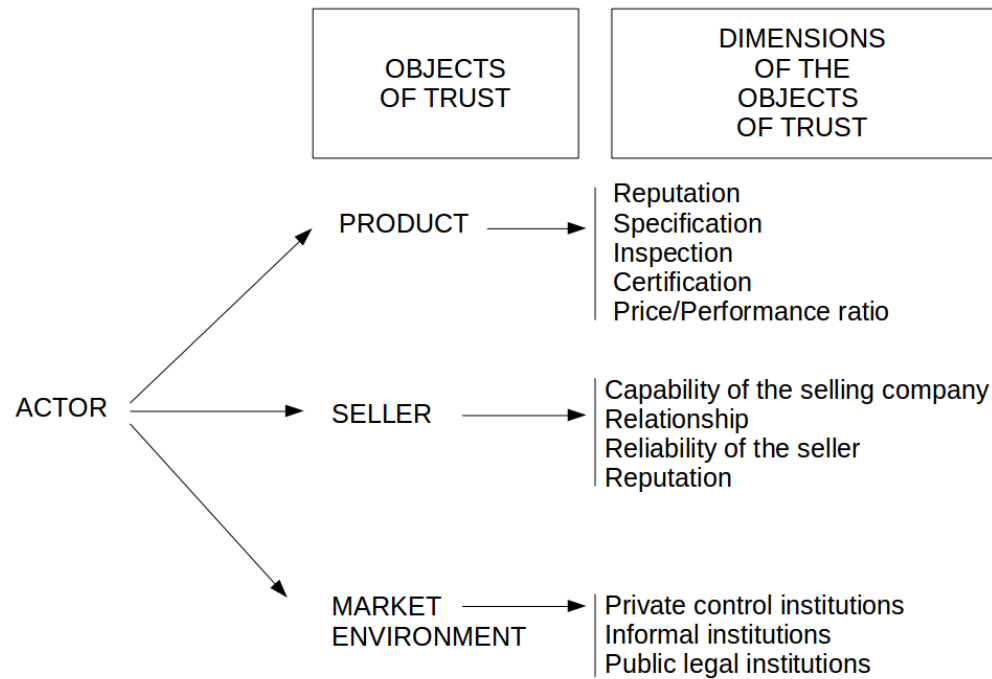
Figure 5.41: Trust in agri-food chain
Source: Canavari et al. (2010)

5.11 Summary of findings

The link between trust and the online environment emerges as a complex but also interesting component from the above discussion. Trust has a structuring influence on online environments. Online environment provides physicality through technology as one has to engage with the technology interface in order to introduce action. But is also requires the inclusion of the various context specific inputs like the social interaction between actors. Riegelsberger *et al.* (2005) indicates the importance of the consequences of this engagement. Although the provision of SST provides a level of control to the actor, there is also a risk of a loss of control over aspects like privacy (Riegelsberger *et al.,* 2005). Priem and Weibel (2012) indicate three different sources of trust that important in online environments:

- Institutional based trust/regulatory framework;

- Calculative trust;

- Relational trust.

From these three components, the institutional level provides the foundation for the framing of action. Governance frameworks set the boundaries for various actors and in doing so defines their function.

The general characteristics of trust can be summarised through the following points:

- A relationship that is *built around an exchange*;

- *Expectations are formed* of the other party's action/s (McKnight & Chervany, 1996);

- *Predictability* occupies a central theme in trust research (Zaheer *et al.*, 1998). Predicting trust has been shown that the antecedents of trust also indicates how effective a virtual team will be (Jarvenpaa & Leidner, 1998);

- Assessments are performed through *subjective probability*;

- *A level of confidence* that other party will honour an agreement;

- The trusting party has a certain *propensity to trust;*

- The trusting party forms an intention to trust and *enters into a level of vulnerability.* Trust starts with a willingness to depend on other people through trust intent. "Trusting intention is the extent to which one part is willing to *depend on something or somebody* in a given situation with a feeling of relative security, even though negative consequences are possible." (McKnight & Chervany, 1996)

- *A trust action* needs to be performed;

- The *possibility of opportunism* exists, opportunity to act opportunistically might present itself;

- *A conflict of interest of the trustee*;

- *A set of obligations* are formed by the trustee;

- *Inability to monitor* the action of the other party Gambetta (1988);

Some of these aspects are trustee-related while others have to do with the truster. Trustee-related elements involve mainly the forming of expectations and the decision to commit to a specific trust situation. Trust is part of a broader contractual environment, where rewards and punishment is available as tools to influence behaviour (Williamson, 1993). Trust can also be seen as a state of equilibrium that represents the unwillingness to cheat ones partner (Dasgupta, 1988).

Institutional trust is not as well understood as trust on the micro-level of individuals (Bachmann & Inkpen, 2011). From the trustee's perspective, a certain obligation is made towards the truster. Within this exchange, the truster has the opportunity to act opportunistically because there are low levels of monitoring involved (Gambetta, 1988).

Using the various models, the following summary is presented in Figure 5.42. The actor is placed central to the functioning of the trust process. The actor is influenced by personal dispositional-based aspects (propensity to trust) and is influenced by perceptions of trustworthiness. The actor is motivated to transact with the institution. The actor interacts with the institution (market) via a technology layer (self-service). Aspects such as the quality, usefulness and ease of use affect the trust in the technology itself. Via this technology layer, the actor interacts with the institution on a transactional, temporal, social and institutional level. The object of the trust transaction consists of three components: product, the other party and the control mechanisms. Product would refer to the physical product and the attributes that would surround the specification and certification. The product could also refer to non-physical services. The other party forms the relational nature of interacting with the institution. This would include creating perceptions surrounding the person's reputation, level of expertise and benchmarking with peers. Control mechanisms would refer to the various formal and informal structures that govern the activities of the role players. Institutions do not only consist of role players internally, but also of external role players like third-party assurance providers that are an integral part of the institutional structures.

From the institution, signals are generated that convey the levels of ability benevolence and integrity through symptoms and symbols. These ultimately affects the perceptions of the actor/s and informs the trusting beliefs and intentions of the actor/s. Engagement with the institution is also presented as occurring in stages namely; search, pre-trust, action and post-trust stage, each of which influences the actor's expectations of the outcome of the engagement.
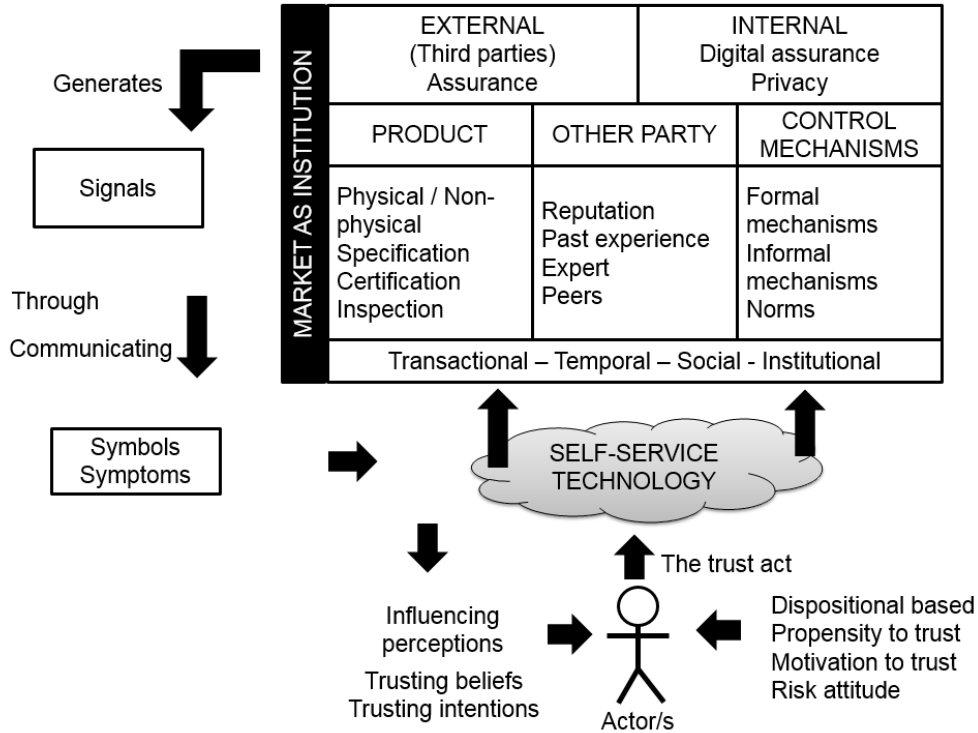
Figure 5.42: Conceptual interaction of actor and institution

5.12 Concluding summary

This chapter presented the literature on the various trust concepts. Trust is complex and this is reflected in the literature. One cannot exclude the individual from trust in social systems as the actor ultimately performs the trust act. This has implications for research as theories that are used to research trust have to provide explicit recognition for the decision-making dynamics of the individual. Table 5.4 establishes the relevance between key literature terms and its use in the thesis.

Table 5.4: Overview of relevant literature terms

Key term	Relevance to case interpretation and framework
Institutional approach	Trust is positioned as linked to an institution as an extention of personal level trust.
Various characteristics of trust	Aspects like ability, benevolence and integrity assists us in identifying these aspects within the empirical data. The link has been established between trust and these characteristics.

Progressive nature of trust	Trust is approached as multi dimensional. This is important when approaching the case environment as this will enhance our understanding of these dynamics.
Trust process	Linked to the progressive nature of trust, the literature positions trust as a process, one is which the engagement between the trusted party and the trusting party is affected by the way in which this process plays out.

The role of trust in stratification is such an example. Trust is influenced by various dimensions, which includes trust within physical products, third parties, technology itself and the service. The online environment (in this context) is positioned as the central conduit for interaction with the institutional environment but does not form the only ultimate object of trust. This chapter also provides an overview of the various definitions on trust and the potential future trust research agenda. Trust research within institutional environments specifically, is attracting academic attention and could emerge as a complimentary field to self-service environments. The next chapter reviews issues surrounding governance structures and looks at governance within exchange environments.

Part 2: Literature review

CHAPTER 6: GOVERNANCE AND MARKETS

CHAPTER ROADMAP

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Chapter 1	Introduction
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Chapter 6	Governance and Markets
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CHAPTER 6: GOVERNANCE AND MARKETS

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" There is nothing more difficult to take in hand, more perilous to conduct, or more

uncertain in its success, than to take the lead in the introduction of a new order of things."

Niccolo Machievelli, The Prince.

6.1 Introduction

This chapter provides a background and an overview of the governance structures within economic exchanges. This chapter argues that the governance structures not only supports trust formation but also play an active role in structuring trading environments and should be a corner stone of SST environments. Specifically mixed mode governance is emerging as part of the emerging complex environments of electronic markets (Alt & Klein, 2011). Governance is approached as the collective set of rules and norms around transactions that form a regulatory and coordinating role between the participants (Bijman, 2006). Williamson (1979) refers to:

> "… the institutional framework within which the integrity of a transaction is decided."
> (Williamson, 1979:235)

The relationship between trust and governance is a complementary one (Alt & Klein, 2011; Tepic, Omta, Trienekens & Fortuin, 2011; Uzzi 1996), as good governance produces higher levels of institutional trust. To deliver SST, governance structures within a specific market environment has to be understood in order to facilitate these various set of rules and norms via technology means, specifically social governance is an important part of institutional design (Alt & Klein, 2011). Through the understanding of the specific market structure and governance dynamics, one is able to design the technology in such a manner that it is complimentary to the workings of trust dynamics. The purpose of governance is to bring "… order (infuse order) to an environment where there is potential conflict in order to achieve mutuality (mutual gain)." (Williamson, 1999:1090).

> "I found that trust is a unique governance mechanism in that it promotes voluntary, non-obligating exchanges of assets and services between actors. These exchanges might entail special treatment on a rush job or giving business to an exchange partner to help him or her fill capacity. Consequently, a significant outcome of trust is that it facilitates the extension of benefits to transacting partners and invites the receiving partner to reciprocate when a new situation arises." (Uzzi, 1996:678)

The perception of electronic environments as automatically self-regulating institutions is flawed. Although platforms like AppStore, e-Bay, Amazon creates the impression of markets places from the end customer's perspective, these are highly structured hierarchical entities (Alt & Klein,

2011). They are created with a very specific purpose and structure, as the introductory quote by Coase (2012) indicates.

The following section looks at governance and its relationship with the institutional context.

6.2 Governance: a broader supply chain view

Governance structures are not generic and differ between different market forms and industries. Coordination within markets is not simply a matter of transactional price negotiation or contract design. A variety of factors are present that affect the way in which governance contributes to the coordination of transactional activities. These are in some cases more social/relational in nature than formal rules. As an example, Menard (2004) in approaching market structures in the construction industry, lists subcontracting combined with strong relationships as a better coordinating method than purely market forces of supply and demand. Menard (2004) also lists agri-food supply chains as a particular example of networks (hybrid market structures) where recurrent contractual ties between autonomous parties characterises the relationships, rather than just the abstract intersection of spot market supply and demand (Casson & Lee, 2011).

At first the spot markets for produce reflects the characteristics of a market where supply and demand dictates all activities, but as one unpacks the relationships, the dynamics of the trade environment that supports the transactional dynamics emerges. The coordination of activities through reputation, transaction costs, quality, quantity and various contract types form key drivers within these chains (Menard, 2004), not just price. Specifically quantity and quality of the product is an important element in daily decision-making within the fresh produce supply chain (Vasileiou & Morris, 2006). Good Manufacturing Processes (GMP), Sanitation Standard Operation Procedures (SSOP), Hazard Analysis Critical Control Points (HACCP) are some of the measures that ensure and create assurance of the quality of the products to stakeholders within the supply chain. The ability to communicate this via electronic exchange as part of the transaction compliments trust. This point is illustrated in chapter 5 where the role of third party assurance emerged as part of trust models.

Trust cannot be divorced from its economic and managerial roots (Figure 6.43) as the underlying activities that fuel economic activity, all have a trust component attached to it. Agency theory (See 6.6) is a good example of how key elements of hidden action and hidden information affect the trust relationship and

how these elements form part of a broader institutional drive to ensure transparency in fresh produce markets.
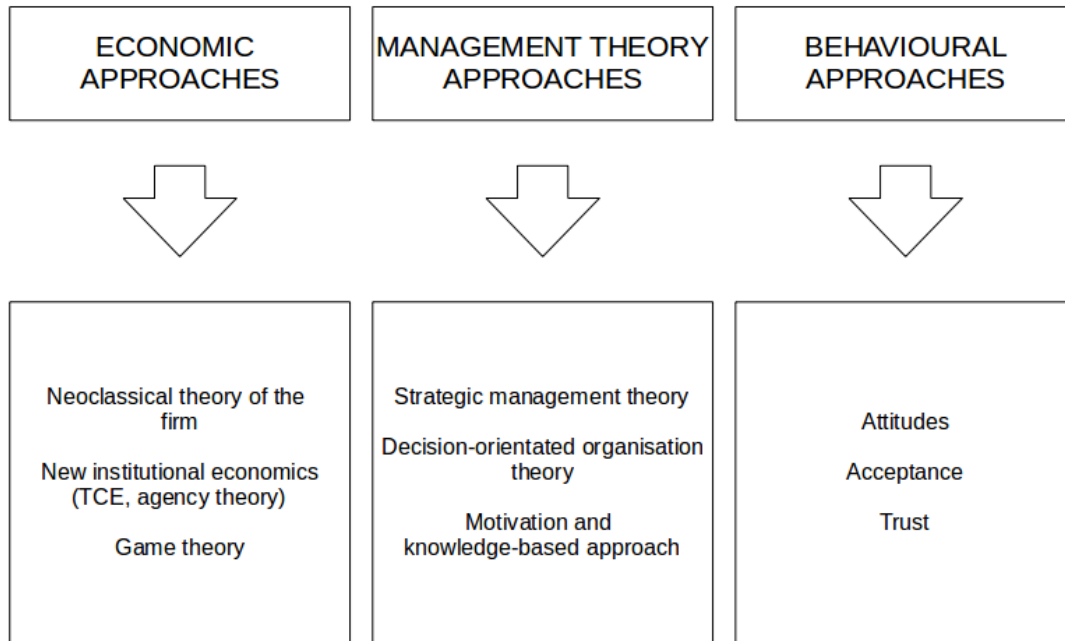
Figure 6.43: Economic and management approaches to trust
Source: Adapted from Schultz (2006)

If the intention is to supply SST then the broader institutional elements have to be incorporated into the provision of SST. Electronic environments have to provide legal, technical and social context within which the customer operates (Schultz, 2006).

The evolution of food system research as presented by Cook Klein & Iliopoulos (2008) offers us an overview of how the integration within supply chains has intensified and raised in prominence within the literature. This is important in light of the fact that these dynamics also influenced the underlying governance structures. *Getting commodity systems right* emerged from Davis and Goldberg (1957) who investigated why the inter-firm agreements took on the form of individual agreements. Market structure performance approaches focussed the sub-sectors on the various supply demand conditions, price management and government roles.
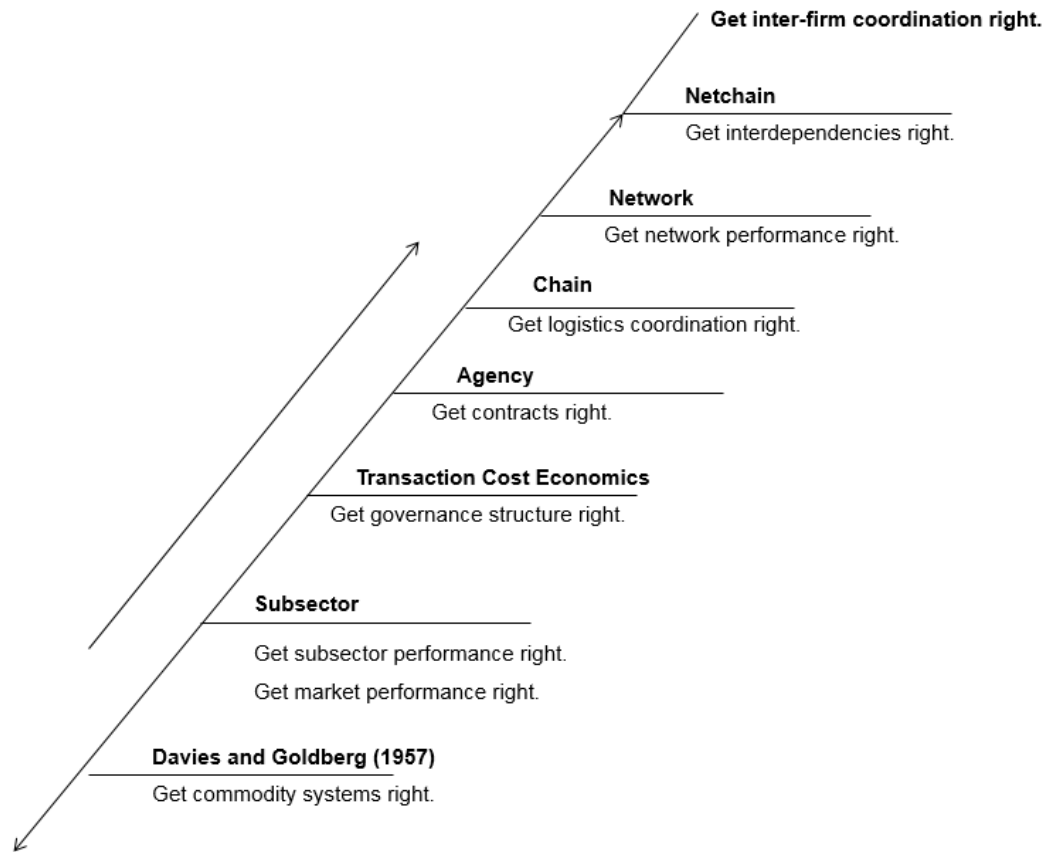
Figure 6.44: Evolution of food system inter-firm coordination research
Source: Cook et al. (2008:294)

Get the governance structures right focussed on the transactional cost dynamics of the inter-firm relations in agricultural chains to understand the increasing complex relationship-specific nature of contracts. *Getting the contracts right* focussed on the principal-agent issues surrounding moral hazard and adverse selection. During the 1990s, the increasing role of the supply chain as a new paradigm emerged. *Getting the agri-chain right* focussed on the coordinated flow of the product from the grower to the customer. The use of technology and the increased pace of globalisation created more complex powerful supply chains. Both vertical and horizontal ties became more coordinated and relationships that are more complex emerged.

Turning to a potential future context of a completely electronic environment Table 6.1 illustrates the characteristics of such an environment. This example highlights the inter connectedness between the various economic and business environments that needs to merge to create an electronic market as an

institution. But the market is only one node in a supply chain and this should be contrasted against the vertical approach to supply chains.

Table 6.1: Perspectives on electronic markets
Source: Alt and Klein (2011:43, own emphasis)

Perspectives ------------------- Drivers	Electronic market as economic environment	Electronic market as governance mode	Electronic market as business model
Technology Push	IT has become a key social and business infrastructure.	IT makes more products and services amenable to market coordination.	IT enabled transaction infrastructures and innovative value propositions.
Market dynamics	New rules and levels of competition drive innovation and market development.	Competition between governance models and between electronic markets drives innovation of coordination mechanisms.	Competition among electronic marketplaces drives service innovation and yields complex configurations of governance models.
Institutional design	Institutional settings shape technology development and its deployment. Political support and regulation facilitate further development.	*Electronic markets are social institutions.* Effective regulation reduces transaction costs, which implies regulatory competition.	Marketplaces are institutionalized transaction environments. *Governance and ownership structures are success factors of electronic marketplaces.*

Within agriculture, vertical integration is an important focus area (Cook *et al.*, 2008). Large-scale integration and consolidation characterises modern supply chains, leading to more formalised contractual farming arrangements (an estimated 36% in the US, up from 16% in 1965). This is however, not necessarily for all commodities. For larger categories such as tomatoes and fruit, contracting is the primary method of trade, but for cash crops, spot markets are still used. It is dangerous to generalise especially when a supplier has multiple marketing options available. Agro-supply chains are typically complex environments and as Monteiro, Sales, Colman and Zylbersztajn (2012) observe in the case of Brazil, the changes in the relationships between supply chain partners affect the nature of the underlying governance structures.

"... global food and agricultural governance is increasingly being created not only by (inter)governmental actors but also by private actors. In the food sector, as elsewhere, next to traditional command-and-control, alternative forms of regulation are being explored,

such as self-regulation, co-regulation, management-based regulation and other private systems of governance." (Fuchs, Kalfagianni, & Havinga, 2009)

Market activity revolve around the various services, products and processes that define it, with technology playing a facilitating role (Kauffman & Walden, 2001). Typically a feedback process is present where technology is affected not only by the user but is also defined through the requirements relating to products and processes. Institutions do generate signals about attributes such as ability or honesty (McKnight & Chervany, 2002). In the same manner SST has to find a way to signal key attributes of the environment. Trust is formed at the social level where participants interact with the institutional level and the social interactions with participants within the institutional environment.

> "Generally speaking, we find that formal institutions tend to influence the behavioural antecedents of relationships whereas informal institutions target the patterns of exchange-specific processes that are instrumental in building a trust-based relationship." (Bachmann & Inkpen, 2011:25)

This description highlights two aspects, firstly that the level of formality of the institutions affect the relationship and that more informal institutions target the more micro aspects of the relationship.

We now turn to examples illustrating that the challenges faced in ensuring trust over geographically separated distances, is nothing new; that the underlying structures regulating trade across vast distances were present long before modern times.

6.3 Impersonal exchange

An historical example from early trade illustrates the dynamics of the broader institutional environment and how this supports faceless relationships. The fact that people transacted with others without an established personal relationship, is illustrated by the history of impersonal exchanges.

> "In such exchanges, a trader's decision to transact is *independent of his partner's personal reputation.* It is made without knowledge of that partner's past conduct, or the expectation of future trade with him, or the ability to report misconduct to future trading partners." (Greif, 2006b:222, *own emphasis*)

In the year 1323, the goods of a London merchant, John de Grantham, were travelling through the port of Dover (Greif, 2006b, *cf.*). There a certain William Virgil laid claim to the goods with the backing of the local Dover court. There was no legal action pending between William Virgil and John de Grantham that would initiate an action. John de Grantham approached the court of London who in turn requested the Dover court to release the goods or face retaliation from London where all Dover merchants' goods would also be confiscated. The Dover mayor explained that the reason for this action was the fact that London did not act on a previous separate debt matter between William Virgil and a Henry Nasard. The matter was subsequently resolved and the goods released to John de Grantham. When William Virgil of Dover transacted with Henry Nasard, he had the expectation that the court of London would support and enforce this agreement. The mayor of London was an official of the "Corporation of the City of London" and thus was partial to local trade interest. But not acting on the request would have led to the port of Dover being closed to London merchants, which would have had a much graver consequence than the actions against a local London merchant. The action "... was not despite the court's partiality, but because of it." (Greif, 2006). Greif refers to this as the communal responsibility system. Greif makes the claim that this *self-governed community-based institution facilitated trade through action and reactions to other community's ability to sanction and retaliate*. This was similar to the structures from the Baltic Sea to the Adriatic Sea, for instance, countries such as Germany, Italy, France, Poland and Flanders.

> "The evolution of impersonal markets and effective polities in Europe therefore highlights the need to consider the developmental ramifications of social structures that, like the communes, fall into a grey area between states and communities … In Europe, the community responsibility system constituted an intermediary institution that was neither purely law-based nor purely reputation-based. It enabled intercommunity impersonal exchange based on the partial legal systems and reputational considerations of communities." (Greif, 2006b:234)

During the early trade, over and above the strong regional nature and loyalty of the local courts, commercial interest on a broader scale was advanced by the merchant and trade fraternity. These would set the rules. *As long as a trader transacted with another in another community was "underwritten" by the power structures to protect the goods and agreements in another port, the trader would transact, without necessarily knowing or trusting a particular individual.*

"His main concern was whether the other community considered the continuation of intercommunity trade valuable enough for its court to enforce intercommunal contracts." (Greif, 2006b:224)

These structures were characterised by:

- Establishment of structures to allow for the *identifying of community* members by both the community and non-community members,

- *The cost of joining the community* was increased to avoid merchants joining that would abuse the structures and dent the reputation of other members,

- The *cost of joining and exiting* were such that it motivated the *retention of the membership* and the conformation to the court's rules.

Greif (2006b) indicated that these formalised intercommunity structures did in fact influence behaviours and assisted in prolonged relationships.

"... in such a setting with imperfect monitoring, mutually costly conflicts of finite durations are necessary to sustain cooperation. The costs of such conflicts deter each court from misrepresenting its private information." (Greif, 2006b:226)

In time though, as the size of communities grew and other legal solutions were introduced, the ability of the community system lost its value but not its dynamics. Structures that are more formal were required to uphold these informal institutional structures across a broader geographical spread and were used to strengthen relationships.

"By fostering impersonal exchange and institutional development, the community responsibility system laid the basis for its own replacement by overarching systems of law-based exchange. Long-distance trade led to institutional change that further fostered growth. More generally, the system had lasting implications on the European trajectory of contractual, organizational, legal and political developments." (Greif, 2006b:222)

The cost associated with non-affiliation decreased and other ways were sought to support trade agreements across ports. Misrepresentation of alliances meant that the jurisdiction of these agreements had to be extended to the country borders. The treaties between smaller regional towns, ports, or provinces were

replaced by treaties between countries. Different countries used the agreements to service their own trading agendas. Italian towns grew faster than English towns, thereby affecting the ability of these towns to function under community-based systems. Internal merchants tended to serve their own agendas; bigger merchants did not want the local constraints of the cost of participation but only wanted the protection it offers. Bigger merchants also had their own reputations that were high enough but feared retaliation and this required the support and input from other merchants. Smaller merchants in turn sought the local protection and rules that it would bring to level the playing field with bigger local traders.

The above illustrates important aspects of power relations inside trade exchanges:

- *Enforcement goes beyond legal structures.* It involves the active participation of the community. How this is structured, depends partly on the benefit to the members but also on the type of risk associated with trade.

- Affiliation with the structure means putting elements in place that *set exit and entry costs to participants.*

- *Identification of the members* prior to trade and verification post trade were important.

- The *functioning of the structure is not permanent and is subject to change,* both from within and from without. From within, the various power positions of participants could destroy the single goal. Some might place different emphasis and attention to different aspects of the agreements based on that individual's agenda. Trading parties in turn might also look at the agreement and align their own personal goals and agendas with it.

Valuable lessons can be learned from this:

"The community responsibility system seems therefore to have contributed to its own demise. Early on, it was self-reinforcing; it motivated communities to define communal membership, establish identity-certifying organizations and strengthen their intra-community enforcement institutions. Over time, however, the system's efficiency and intra-community political viability declined due to trade expansion *and growth in the size, number and economic and social heterogeneity of merchants' communities. Ironically, the system seems to have undermined itself; the processes it fostered were those that increased trade and urban growth—the causes* of its decline." (Greif, 2006b:231*, own emphasis*)

How did the institutional structures support these exchanges, given the fact that the legal structures in early England (1000s) were under the control of the elite?

Greif (2006b) offers the following suggestions:

- Legal and political *power was also in the hands of those who would benefit* from the impersonal exchanges.

- *Courts had to be incentivised* to uphold property rights and the spot exchanges were protected.

- *Enforcement of contracts* (specifically future contracts) enabled exchanges (quid and quo) over time and space.

- *Protection of future transactions* as well as credit was a high priority.

The above illustrates the broader institutional dynamics that one has to consider as part of creating an exchange. These are not new issues and are generic across different industries. What we do see is the role that the community plays in self-regulating activity, the need for legislative frameworks governing the flow of goods, the coordination of activities between supply partners and the importance of being able to enforce contracts.

6.4 Governance structures

Governance structures, according to Bijman (2006), have two main functions, i.e. the safeguarding against misappropriation of quasi rents and coordinating decisions and activities of transaction partners to protect but also to facilitate trade.

> "An effective governance structure compensates for the legitimate negative expectations that parties have of each other regarding future behaviour. Negative expectations are legitimate when third parties, who do not hold any stake in the relationship, state that anyone placed in a specific situation would mistrust certain explicit or implicit promises made by one of the stake-holding parties." (Vosselman & van der Meer-Kooistra, 2009:271)

Aspects such as arbitration, regulation, policy and coordination of these activities are as relevant in electronic exchanges as they are in physical exchanges. Typically, ex ante intentions require a form of commitment and assurance the remedies are sought ex post. Open spot market transactions exhibit lower

levels of formal contracting and more transparent, less costly information flows as indicated by Cook *et al.* (2008). The emergence of contractual and vertically integrated types of agreements is inherently less transparent to the broader supply chain but not necessarily less efficient from an economics point of view. Williamson (2005) sketches the following picture of the nature of spot markets:

> "... the market mode works out of high-powered incentives, little administrative control and a legal-rules contract-law regime, which is well suited to implement autonomous adaptations but poorly suited to effect cooperative adaptations." (Williamson, 2005:7)

These dynamics reflect the short-sighted nature of spot market transactions and although this might be the case, from a governance point of view, the strengthening of controls and enforcement of contracts should assist the strengthening of the specific spot exchange:

> "In spot market exchanges, pig producers and slaughterhouses negotiate only short-term contracts and are ready to change their selling and buying behaviour very quickly; 'control is fully located at the separate stages and coordinated solely by market prices'. The transactions are governed by classical contract law: 'sharp in by clear agreement, sharp out by clear performance'". (Schulze, Spiller & Theuvsen, 2007:36)

Transactions are more than just short-term is affected by routine:

> "Transactions are not only short-term isolated activities, but should be seen in a longitudinal view where the future potential relationship affects current actions." (Williamson, 2005:2)

To approach agribusiness supply chains, three aspects are important (Monteiro *et al.,* 2012):

- The basic structure of the market (price, quantity);

- Formal contractual agreements;

- *Non-contractual* dimension of transactions;

Long-term relationships are more reliable and require lower search and switching costs (Schultze, 2002). These relationships combined with the nature of the particular market environment influence the nature of transactions. Institutions play a direct role in addressing various inefficiencies and reduce market power of groups through the introduction of regulatory measures (Uzzi, 1996). The risk with having multiple participants is that there are supposed to be rules that define roles and actions, enforcement, recourse and

punishment. The custodian of these rules forms the domain of the authority enforced by laws, mutual agreement, or social/cultural convention (Casson & Lee, 2011). Monteiro *et al.* (2012) sketches this vertical nature of the supply chain with its forward and backward linkages. (Figure 6.45).Trust created in the supply chain does not only rely on the transacting party, but could be affected by parties up and down the chain in what Svensson (2001) calls a "synchronised trust chain". Figure 6.46 provides an example of how the trust chain functions on South Africa's markets.

This institutional view indicates that trust has to approach not only the formal contractual environment, but also the informal aspects surrounding transactions. Trust is a form of governance (Wang & Emurian, 2005) and trust between parties in exchanges rely on more than only personal trust. It is also based on trust in the broader system (Casson & Lee, 2011). Institutions include the broader social rules and sanctions that make economic interaction less risky (Groenewegen, Spithoven & van Den Berg, 2010). As Lewis (2011) showed, the institutional structure built around e-Bay forms a governance structure that assists contract enforcement. A minimum of shared norms are required for any formal agreement to have an effect on behaviour (Riegelsberger *et al.*, 2005).

Building a trust chain depends on the following seven steps (Svensson, 2001):

- Internal trust within the firm;

- Trust issues downstream to customers;

- Trust issues towards supplier – upstream to input

- Trust issues downstream towards customer's customers.

- Trust issues downstream beyond customer's customers.

- Trust issues downstream towards supplier's suppliers.

- Trust issues downstream beyond supplier's suppliers.

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INSTITUTIONAL ENVIRONMENT

| INPUT | AGRICULTURE | INDUSTRY | DISTRIBUTION | CONSUMPTION |

ORGANISATIONAL ENVIRONMENT
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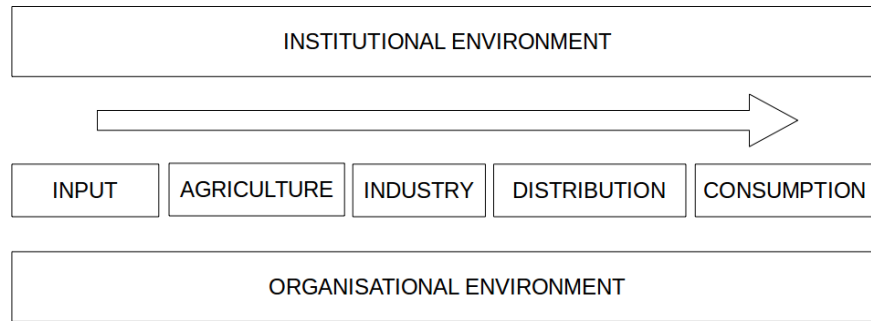
Figure 6.45: Agro-industrial system
Source: Monteiro et al. (2012:671)


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GROWER  >  MARKET  >  AGENT  >  BUYER

Department of Agriculture - legislation

Agricultural Produce Agents' Council

Owner/Shareholder – City by-laws

Treasury
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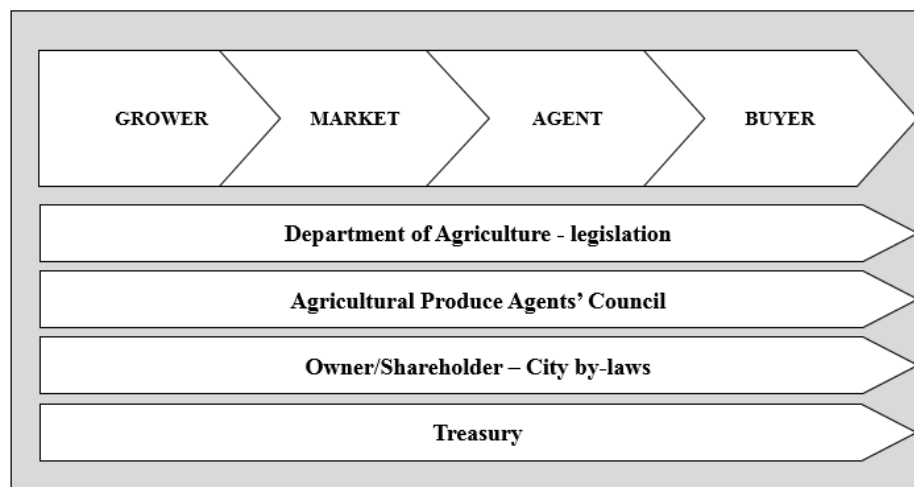
Figure 6.46: Markets: Underlying institutional legislation
Source: Field Notes

The chain also seeks to introduce coordination efforts in a constant process to reduce transaction costs and increase the performance related to its ability to coordinate transactions (Monteiro *et al.*, 2012). An example of this would be standardised labelling and packaging. Importantly, not only the structures of the market but the non-market contractual relationships also influence this dynamic.

These points highlight the importance of standardised processes to provide vertical assurance to the various stakeholders within a market environment. Agricultural contracting, however exhibits some unique characteristics (Cook, Klein & Iliopoulos, 2008) that introduce risk into the process:

- Agriculture production processes are closely linked to *biological production* functions that are not under the control of suppliers. Seasonality and adverse weather further play a role in creating an

uncertain production environment.

- The *perishability of produce* creates monopolistic and monopsonistic market structures due to the high levels of asset-, relationship specificity and knowledge required to operate farming enterprises.

- Agriculture finds itself in a unique political and regulatory environment. Food, land and farming are seen as a special sector due to the potential destabilising effects a failed agricultural sector has on a country and the emotive bond to the romanticised concept of farming that is seen as part of the character of a country.
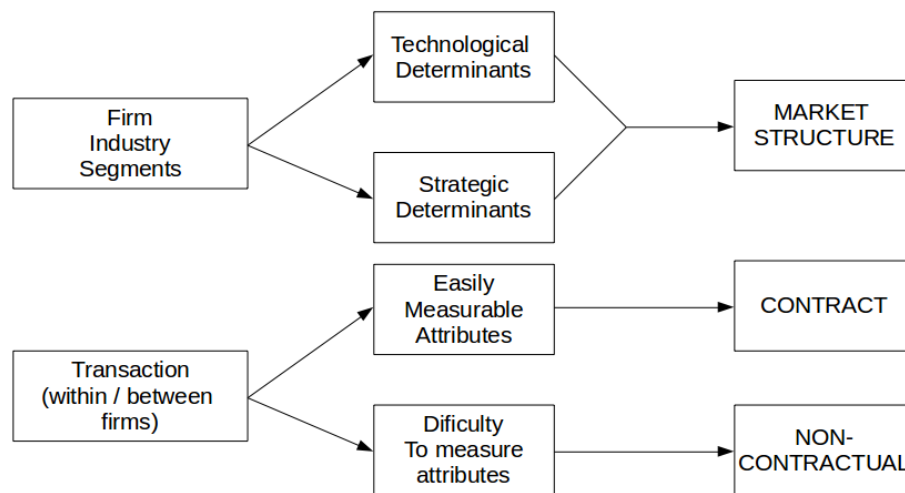
Figure 6.47: Levels of analysis. Source:
Monteiro et al. (2012:673)

Figure 6.47 summarises the view and shows the link between the contractual and non-contractual environment. At the transactional level, all the attributes of the product have to be considered but not all these can be contractually specified so an extension of formal contractual arrangements needs to be present. Formal institutions include laws, contract rules, formal codes of conduct and official arrangements, while informal institutions would include norms, traditions, standards, arbitrage, customs and culture. Business relationships generate embedded aspects that are different from arm-length relations (Bijman, 2006) and reputation, social sanctions and culture are key parts of network governance. Contracts are embedded in contractual relationships (Menard, 2004) but contracts and contractual relationships should not be seen as the same thing. Due to these factors, agricultural supply chains have created some specialised governance structures such as cooperatives, special contracting, informal contracts and special

cooperation agreements to assist in governing the relational dynamics of the industry. Fresh produce markets can be positioned as hybrid forms of governance structures. Spot markets functions optimally when participants can freely participate without high levels of asset specificity, but on the other hand, are not really in a position to effectively self-regulate and thus requires more formal enforcement procedures due to high levels of potential opportunism. Thus, one finds markets functioning more as hybrid structures than purely free markets (See Figure 6.48).

Somewhere in between, one finds contracts reflecting the various dynamics. On spot markets, contracts are typically short-term transaction-based and reflects high uncertainty. Once parties are involved in longer-term relationships, the contracts are more formal and aimed at establishing a relationship over a prolonged period (seasonal contracts are a good example). Higher levels of investment are also required into packing and logistical assets to ensure contractual compliance. Spot markets typically suffer from lower standards as the contractual relations are not aimed at establishing longer-term relationships. Contracts as a framework have the following characteristics (Williamson 2005:9):

- All complex contracts are unavoidably incomplete;

- Only a framework and never accurately reflects real working relations;

- Rough indication of the intentions of relevant parties;

- Reference for occasional doubt;

- Norm of ultimate appeal.

It is clear that the above characteristics point to the creation of a governance environment that pro-actively addresses these shortcomings. With this view, the role of a governance framework becomes more crucial (Menard, 2004).
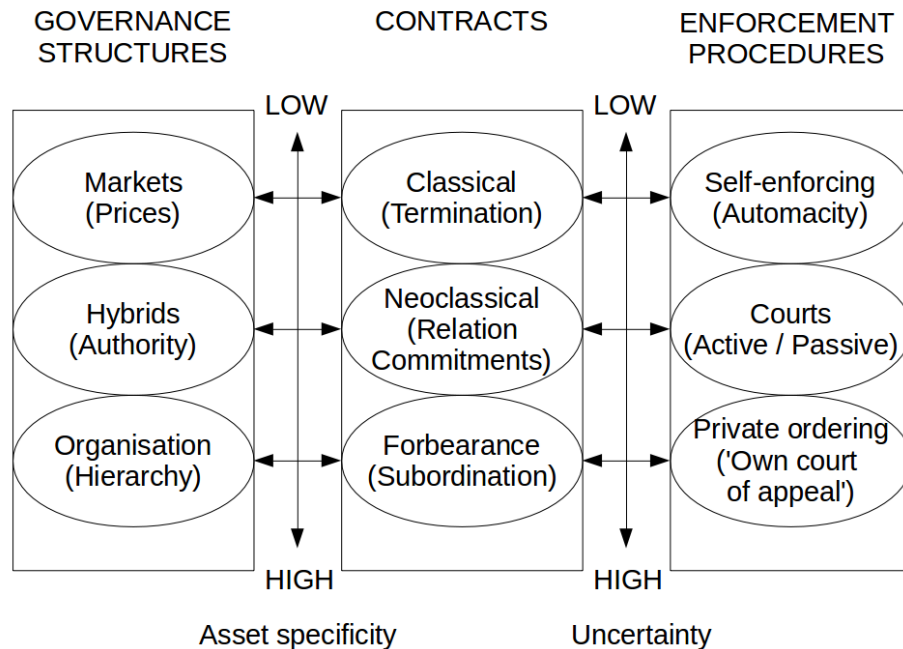
Figure 6.48: Enforcement procedures and governance structures
Source: Menard (2000:249)

Regulating and coordinating activates, especially in spot market contexts, cannot rely on ex post contract enforcement through legal channels alone. A much more constructive measure is to look at a proactive method through the structuring of governance structures. Governance is much more than mere contracts. Contracts are not being constantly redesigned to achieve an optimal state (Menard, 2004) and are reliant on the non-contractual relationships to regulate these activities.

> "… the legalistic view of contract that applies to simple transactions needs to make way for a more flexible and managerial conception of contract as the preservation of the ongoing relations takes on economic importance. The convenient notion of one all-purpose law of contract gives way to contract-laws (plural) in the process." (Williamson, 2005:9)

Formal contracts provide the explicit boundaries of the arrangement (Cuganesan, 2007). To rely on legal notices and privacy agreements for governance is clearly not enough (Meinert, Peterson, Criswell & Crossland, 2006). The institutional view of self-service environments redirects our attention to these and other elements that might possibly affect the trust relationships and on how to pro-actively monitor and regulate through the group as self-regulating authority.

Menard (2004) lists the following characteristics of hybrid structures.

- Number of parties (bilateral and multilateral): Bilateral agreements require high levels of dependency while multilateral agreements allow for benchmarking and comparison, which assists in removing opportunism.

- Duration: Relationship between duration and intensity of coordination.

- Requirements: Specifications around quality and quantity standards are important. Requirements also include perceptions of freshness, variety, novelty and convenience (Mainville & Peterson, 2005). These are attached as annexes to contracts to reflect the specific situation. Specifications carry three characteristics, i.e. observable commitments, standardise steps in distribution and production and enforcement of uniformity to reduce monitoring. Prices (markets) and autonomy (hierarchy) play a role in coordinating activities to a lesser extent.

- Adaptation clauses: Clauses that are tailored for the specific transactional environment.

- Complimentary safeguards: Regardless of all the clauses, the contracts remain incomplete and open to opportunism. Safeguards could be formal (special investments) or informal (relational and reputational,

- Standardisation: Uniformity in contracts is driven by similar transaction costs. Contracts are the framework, but complementary mechanisms are required to monitor and manage hybrid relationships. Menard (2004) offers the following rent regulating mechanisms:

- Reputation: Frequent recurring transaction (Menard, 2004) of a similar nature is a characteristic of the industry. Demand for food repeats on a daily basis and this is reflected in our ability to procure and sell produce. Credible commitments and credible threats complement each other to enhance reputational aspects.

- Negotiating devices: Well-identified arbitrators that represent negotiating blocks.

- Formal authority: Joint committees to negotiate on their behalf. Higher levels of uncertainty produce higher levels of formalisation.

"… the emphasis here is on partners monitoring their network and controlling their actions and decisions through specific and identifiable organizational devices that they have intentionally designed. The authority in the hands of these private governments involves

both intentionality and mutuality, maintaining some symmetry among participants."
(Menard, 2004:366)

This reveals the social dynamics within relationships that create trust on a recursive basis.

The following section looks at third parties and their important role.

6.5 Role of third parties

Perishable products are characterised by higher levels of quality control. Other more storable commodities such as corn, rice, wheat and cotton provide the owners with a broader speculative window and the ability to hedge against future price adjustments. Perishability is the motivation for more closely integrated coordination between growers and packers (Hobbs & Young, 2001). Quality poses challenges to the reporting of prices, as the range of prices cannot accommodate the range of quality attributes (Hobbs & Young, 2001). Assurance and spot market transactions in the pork industry in Germany is a specific example:

> "Furthermore, quality assurance schemes such as the Dutch IKB or the German Quality and Safety System have reduced quality uncertainties and, thus, favour spot market transactions over alternative ways of organising meat supply chains." (Schulze *et al.,* 2007:35)

Third party mechanisms play an important role in establishing trust (Ba, Whinston & Zhang, 2003). Granovetter (1985) points to the fact that the size of the gain from non-fulfilment might outweigh the influence of *internalised norms*. Uncertainty of the intentions and or ability of other parties to perform, is policed by the third party, which creates trust signals to trusters (Riegelsberger *et al.,* 2005). Ahmadi-Esfahani and Locke (1998) however note:

> "Employing technology to overcome this problem, such as electronic trading, may prove difficult in fresh food markets where standardisation is more difficult." (Ahmadi-Esfahani & Locke, 1998:92)

The assurance structures perform a vital function. Kim, Song, Braynov and Rao (2005) recognise the role of third parties, as can be seen in Figure 6.49 and Figure 6.51.
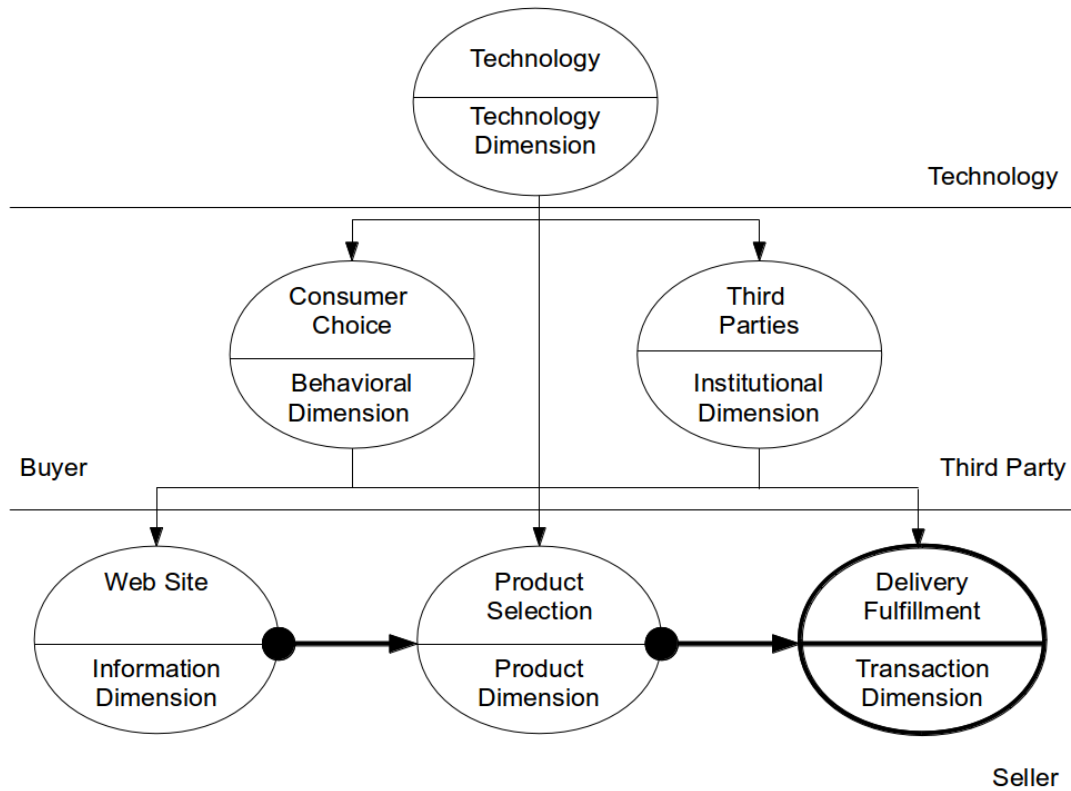
Figure 6.49: Process-orientated multidimensional trust formation
Source: Kim et al. (2005:146)

Electronic third party seals (TRUSTe, BBB and WebTrust) can increase trust (McKnight & Chervany, 2002; Cheskin Research, 1999; Kim & Benbasat, 2003). But apart from seals of approval or third party certifications, quality of web site design, ratings, or customer testimonials, endorsements by reference groups and guarantees form indirect measures to enhance trust (Meinert, Peterson, Criswell & Crosland, 2006). These all combine to provide an additional layer to governance structures. Various role-players are involved in creating these structures. In the certification process for example, there are three parties involved (Backhouse, Hsu, Tseng & Baptista, 2005), i.e. the subscriber, the certification authority and the relying party. Certification creates a triangulated point between these parties. But the ability to integrate and align the various agreements needs to be in place to facilitate the functioning of third party assurance.
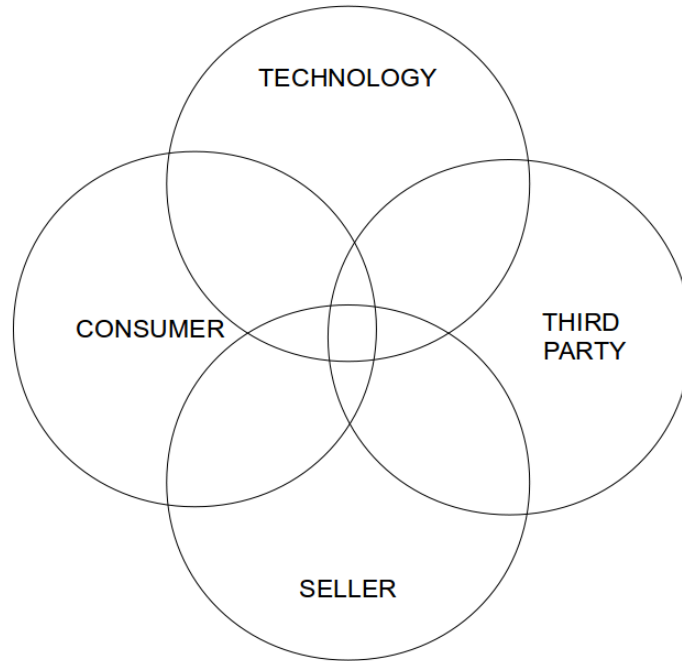
Figure 6.50: Four entities of e-commerce markets
Source: Kim et al. (2005)
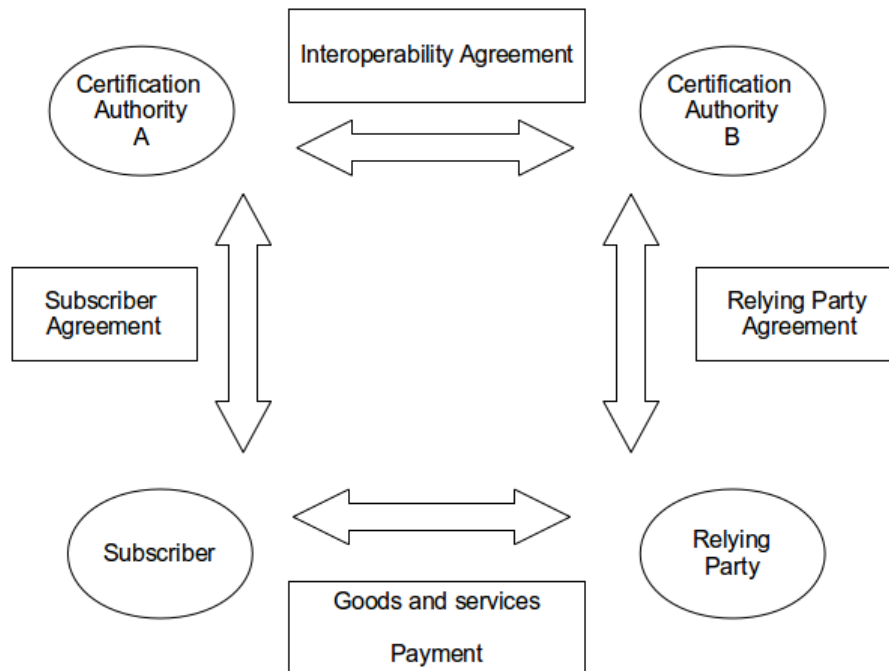
Figure 6.51: Dynamics of third party relationships
Source: Backhouse et al. (2005:89)

To mitigate these aspects third party assurance plays a crucial role especially in fresh produce. Certain aspects of the product attributes can be associated with the ability to contract (Monteiro *et al.,* 2012). The colour for example of the object can form part of the contractual agreement, but the smell of the product would be difficult to measure and monitor. Fresh produce offers numerous challenges relating to this aspect and thus poses challenges to the contractual agreements and creates opportunities for contractual breaches. Monteiro *et al.* (2012) refer to the distinction between the legal property rights and the economic property rights (linked to the consumption). These more subjective aspects of the agreement requires a more relational and informal mechanism.

The following section looks at principal-agent theory and its role in describing the relationships on markets.

6.6   Principal agent theory (PAT)

Principal agent theory is briefly discussed as it assists in *describing the nature of the relationship* between the grower and the agent/market. PAT aims to explain the relationship between a principal and its agent where self-interested individuals tend to act only in their best interest (Levinthal, 1988). The relationship between the principal and agent in the market environment is accurately captured by this theory as the principal (grower) sends produce on consignment to an agent who has to sell it on their behalf. This occurs without any formal contract. In this context, PAT offers a tool to assist in understanding the underlying dynamics related to this relationship. Not only is this relationship the focus of this section, but also the broader service environment. PAT will be used to map the various relationships in existence on these markets.

PAT deals primarily with the relationship between a principal (owner and main risk taker) and an agent (the representative of the owner). The agent acts in a position where the agent's actions have an influence on the principal's welfare and vice versa. Typically, this relationship occurs in an environment where the principal does not have the ability to monitor the actions of the agent and needs to rely on monitoring and information structures to measure performance and ensure compliance to the welfare-maximising expectation of the principal.

The term 'principal' within the theory refers to the main party while the 'agent' refers to the provider of extended services. This is however not as clear-cut, for instance in insurance, the client is the agent, having

the extended relationship with the insurer and representing the risk. The combination of uncertainty and specific investments raises the probability of ex post opportunism (Menard, 2004). The intention of contracts is to specify ex ante how the benefit of the potential arrangement will be shared, but results are observable only partially. Thus, the post-contractual dimension is where the potential trust breach is most prominent. Principal agent theory provides an important description of these relationships observed on markets.

PAT introduces some key concepts. The first facet of PAT is the separation between the owner and the level of control, which creates the potential for those that control the principal's assets to have the opportunity not to act in their best interest (Berle & Means, 1932). An agent is in an advantageous position with knowledge about their actions being hidden from the principal (Pratt & Zeckhauser, 1985). Information plays an important role in the building of trust between the principal and the agent and it comes at a cost to the agent to provide this information (called agency cost). When the goals of the principal and the agency are not aligned, it increases the level of information along with the cost. Arrow (1984) introduced the terms 'hidden action' (moral hazard) and 'hidden information' (adverse selection) to describe the above scenario. Hidden action refers to the non-observable nature of an agent's action. Hidden information is best described by asymmetrical information where the free flow of information is completely hidden, filtered or simply manipulated (Akerlof, 1970).

The internet is characterised by high levels of information asymmetry and yet despite this, certain online environments thrive (Lewis, 2011). Of all places, the anonymity of the internet has the potential for participants to not disclose their identity or be selective about the products they sell. The ability to interpret signals plus the possibility that the trustee will emit misleading signals complicates the use of signalling (Riegelsberger *et al.,* 2005). Information flow is central to creating trusting signals amongst participants (Tepic *et al.,* 2011). It is interesting to observe that the majority of informal governance related issues is associated with information and signalling. Packaging standards and certification are examples of signalling that provide additional assurance to role players as part of a transactional relationship.

The key elements of PAT can be summarised as follows:

- Relationship based on cooperation: This is an extended relationship, in the case of the FPA, the selling function of the produce. This relationship typically occurs in an environment where the actions of the agent are not directly observable by the principal, in which the dilemma lies. How do the principal and agent structure such a relationship to attain an optimal dimension? These

concepts are inversely related, the principal expects more effort for lower remuneration, but the agent would prefer lower effort for higher remuneration.

- Asymmetric information: The actions of the agent are not observable by the principal. As the owner, the principal does not know if the agent's actions reflect the best interest of the principal. Monitoring, contractual and information structures are employed to provide better transparency surrounding those actions. This is however not optimal. The trust placed in the agent by the principal plays a critical role in stimulating this relationship. Information is not merely data. It refers to the complete set of signals that is released. A distinction must be made between general market information and information relevant to the specific agent-principal relationship. Information about general market conditions could be accessible by both parties at the same cost.

- Extended relationship: This is the broader relationship between the agent and the principal that extends, or is still formal until transaction, or continuously as in the case of insurance. The cooperation between the parties is influenced by the welfare-maximising attitudes of both agent and principal. Both parties have different (changing) expectations of the nature and outcome of the relationship. The more these aspects are aligned, the more optimally the relationship functions.

- Screening: The principal needs to screen the agents to determine the fit of the agent and to determine potential risks in dealing with this agent.

- Maximisation of welfare: Both the agent and principal seek to maximise their individual utility through their actions.

- Action of the agent: The agent must choose from among a variety of possible actions. It is important that the outcome of the action affect both parties.

- Reward structure: The principal is in the position to determine remuneration/reward for the agent based on the outcome of the agent's action.

- Risk sharing: Risk is shared between agent and principal. Both parties seek to limit the risks of participating. The principal will engage with an agent to consume the services of that agent. Typically, the agreement will reflect the levels of risk to both parties.

- Corrective action of the principal: If the agent does not perform according to the beliefs of the principal, the principal will attempt to seek another agent or stop the relationship.

- Contract: The relationship is usually formalised around a contractual agreement. Contracts typically reflect the various potential areas of risk present in the transaction/s. Both parties tend to hedge against this by agreeing on certain rules.

- Information's role: PAT uses the concept of asymmetrical information. The principal is not always in the position to know what the agent is doing. Unequal information specifically contributes to this situation.

- Control: The agent is not entirely in control of the outcome. The environment that the agent operates in, consist of elements that the agent cannot control.

- Monitoring: Due to the potential of opportunistic behaviour, the principal relies on a monitoring function to evaluate the performance of the agent. In addition, the agent also requires some monitoring of the principal's action as he might be making decisions that affect the agent's ability to perform optimally.

- Moral Hazard: (hidden-action)

- Adverse selection: (hidden-information)

- One principal – many agents: In the event, where there are many agents, the principal requires some sort of framework to measure them against each other and to remove elements such as personality from the decision-making process. The screening of agents is obviously a cost. If the market absorbs that cost then the transaction cost to the principal will reduce.

- Collective outcomes: The collective actions of the agents and or principals determine the outcome of the system.

Gundlach and Cannon (2010) produces the following important framework towards addressing trust related issues in exchange relationships:

- Produce information about performance and intentions (Mayer *et al.,* 1995; Rose, 1995);

- The information-based approach is captured in the well-known phrase "trust but verify", which reflects trusting exchange partners' attempts to address the vulnerabilities inherent in trust by producing relevant information;

- Monitoring a supplier's outputs;

- Openly sharing information;

- Actively monitoring the supply market for information, including current and potential suppliers.

Information is established as a critical aspect of creating electronic exchanges. This implies that SSTs need to develop information strategies targeting the various role players and ensure that the relevant signals are passed on to stakeholders.

6.7 Concluding summary

This chapter provides an overview on various governance aspects related to fresh produce market environments. Governance and trust have been shown as being positively correlated and that a strong and well-structured governance framework contributes to strengthening trust. The discussion surrounding trust would not be complete without looking at governance structures and their functioning. The specific market structure carries with it specific governance structures and these are characterised by specific contractual relations. Table 6.2 establishes the relevance between key literature terms and its use in the thesis.

Table 6.2: Overview of relevant literature terms

Key term	Relevance to case interpretation and framework
Governance	The importance of governance within the cae environment and its link to trust creation is included as an important element that needs to be highlighted in the case and framework.
Third parties	Third parties play a key role to the enhancement and support of institutional structures. They are thus important components of an environment like markets.
Principal and agent relationship	The relationship between the principal and agent, specifically the dynamics that govern this relationship is important aspects that assists us in understanding the dynamics within market environment.

Contractual relations where shown to extend the formal contractual points. A vertical approach to governance was also presented. As product flows through a supply chain, assurance is not just isolated within each node, but flows with the product vertically along the supply chain. Trust is formed throughout the supply chain and not only at the point of transaction. Information flows emerged as a critical element in the creation of trust. Without credible and relevant information flows, the various governance structures

are set to weaken and opportunism set to increase. Information acts as signals to participants, conveying the intentions of participants, confirming expectations and showing ability to perform. The chapter concludes with an overview of the various governance structures on markets.

The chapter highlights the following:

- Cost of participation (entry and exist) and the allocation of roles are highlighted in this chapter. The examples indicate the importance of providing clearly formulated structures within which participants take part in the exchange.

- Although price and quantity uncertainty might affect the transactional dimension, the frequency and complexity of the transaction itself plays a role in the perceptions of role players.

- Institutions are governed by both formal and informal contractual agreements. The credibility (and subsequent trust in the institutions) is directly affected by its ability to support and enforce these various agreements.

- The relationship of a grower and the market is accurately described by principal agent theory. The dynamics of this theory should form part of the underlying approach to trust formation.

- The nature of the product (highly perishable) emerged as a key aspect forcing the provision of additional assurances. This is across the supply chain. The provision of an assurance chain and the integration of this aspect will play a central role in building trust in the institution.

- Recognising underlying market structure influences governance structures.

- That governance structures in turn are specific to institutions and these influences the relationship between role players.

- That there is a broader vertically integrated approach required in order to facilitate trust signals wider than just the specific institution (the market in this case,

- Governance structures consist of more than formal rules and include informal aspects.

- The above has a relation to trust forming within institutions and that this needs to be made part of SST implementation in order to build trust.

The next chapter provides and introduction to fresh produce market environments.

Part 2: Literature Review

CHAPTER 7: INTRODUCTION TO WHOLESALE MARKETS

CHAPTER ROADMAP

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CHAPTER 7: INTRODUCTION TO WHOLESALE MARKETS

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"One should expect trust to be increasingly in demand as a means

of enduring the complexity of the future which technology will generate."

(Luhmann 1979:16)

7.1 Introduction

This chapter introduces wholesale spot markets and provides background on the characteristics of these markets, their inner workings and the application of technology. The extent to which technology can be applied and utilised depends on how the specific food markets are physically structured from an ownership, operational and business case perspective. The underlying structure of a fresh produce market in turn affects the way technology support and facilitates the various services markets offer.

The nature of the relationship between the market authority and other stakeholders is affected by issues such as governance structures, ownership of the process, the control and ownership of the product, the type of products sold, the ownership of technology, levels of electronic integration, availability of standards and the type of contractual relationship that exists between the grower, agent and the buyer. Understanding this broader context is required to view self-service solutions within the correct context. In the case of Bestor (1992), the Tsukiji Central Wholesale Market for seafood in Japan highlights the value of understanding the institutional environment through the specific product's technicalities, the history and culture:

> "... however, is not so much what it may tell us about the specific workings of this one marketplace but the light it may shed on how analysis of economic transactional patterns, of the historical, social and political dimensions of institutions and of the cultural values that motivate actors within a marketplace must be linked in order to understand the operations of complex economic systems." (Bestor, 1992:3)

Food spot markets differ greatly in how they are owned and operated. Ownership of the processes for example affects the ability of the management of such a market to enforce the sharing of information and ensure transparency and ultimately a trusting environment. Structure of markets also affects how contracts are negotiated and enforced. Markets are an integral part of a broader demand, supply, logistical and infrastructure function both forward and backwards along the chain. This is still the case today and these principles still shape the way spot markets are positioned within a specific value chain.

The discovery and transmission of prices, the integrity of those prices and the transparency to a broader set of stakeholders contribute to the perceived trust, which the various stakeholders place in spot markets. Some of the underlying dynamics need to be understood before SST can be considered. Alt and Klein (2011) illustrates the potential benefits moving to an electronic market environment:

"Technological advancements combined with market entrepreneurship have driven an extension of market coordination into a broad and diverse array of domains from marketing, to health care or forecasting. Price-based coordination mechanisms have benefitted from reduced information and brokerage costs and provided extended allocation efficiencies. Moreover, the research field of micro market design has contributed to understand issues, such as price building or auction rules." (Alt & Klein, 2011:44)

SST is a component of a broader technology eco-system consisting of, amongst others, operational, logistical and administrative, *SST as a point of contact* plays a more condensed role in creating perceptions about institutional environments. The following section looks at the establishment of wholesale spot markets.

7.2 The establishment of wholesale spot markets

Food markets are characterized by the direct involvement of governments. In the case of South Africa, these markets are viewed as a channel for exercising the social mandate of governments. This aspect directly affects the way governance structures are structured and enforced. This is illustrated in the following statement of the vision and mission statement of the Johannesburg Market (see Table 7.1).

Table 7.1: Johannesburg Market Vision and Mission
Source: Johannesburg Market (2015)

Mission:

Our mission is to build long-term sustainability and promote socio-economic transformation through the provision of world-class facilities and services to the fresh produce industry.

Vision:

Our vision is to be the preferred world-class African fresh produce market.

Food markets are a tool for governments to influence and in some cases control food provision. Governments play a central role in achieving and developing food supply chains. They do so either directly, in the case of providing market facilities, or indirect through legislative quality standards. Food markets are seen as a vehicle to deliver and affect government priorities such as food security and socio-upliftment:

"Markets have demonstrated the potential to bring together agricultural stakeholders, food security and nutrition advocates and environmentalists to establish new partnerships and coalitions in the food system." (Ostram & Lyons, 2012:71)

"Substantial benefits can be gained by encouraging the more professional approaches for provision of marketing infrastructure and other facilities in the markets where wholesalers can purchase the produce from a large number of its growers and in turn sell to retailers." (Sheikh & Ghafoor, 2004:330)

Table 7.2 provides a modern example of how the combination of state intervention and commercial food distribution combines to create wholesale spot markets.

Table 7.2: The Rungis market
Source: Rungis (2015)

The Rungis market is located close to the city centre. Initially built on the outskirts in 1960s, it was engulfed in the urban development that reached there. Estimates are that Rungis provides 50% of the food for Paris. It also acts as export location to other European countries. Around 20 000 customers, 4 000 fruit and vegetable retailers and 1 400 tenants are active on the market. The market sells fish (40 000 tons), meat (40 000 tons), triperie (30 000), fruit and vegetables (100 000 tons). Smaller specialist stores are still very prominent as the supermarket developments have been controlled by city planning controls.

Legislation protects the Rungis market, as it is illegal to sell wholesale meat, vegetables, fruit and fish other than on the Rungis market. The market also serves as a redistribution point for various supply chains, supermarkets, exporters and the market has an on-site government inspection service. Rungis is funded by local government, shareholders from tenants and regional suppliers. The market's revenue consists of entry fees, rent and service charges. They offer the buyers the opportunity to find everything that they need in one place. The cooperative ownership environment on the other hand strengthens the markets' vision and strategic direction. In combination, these role-players jointly seek solutions to the challenges of threats such as retail. Development of value adding and e-commerce solutions is done in a way that benefits the whole market.

This implies that the mandate of the market, from shareholder to management is aligned with the national objectives of government, in addition to the commercial objectives of the facility. This alignment with a broader socio-political system has implications for the agenda of the management of the market as well as the asymmetric power structures and how resources are allocated. In the case of South Africa's fresh produce markets, this also has a direct impact on how control over technology platforms is exercised (see chapter 8 and 9 for more background).

The international trend relating to the creation and structuring of markets is as follows (Tracey-White, 1991b):

- *Establishment with state funding;*

- *Local authority/Council involvement – market committees;*

- Mixed products – meat, fish and dry goods;

- Space allocation for trade via a license process;

- Market revenue from rental fees (see chapter 8 for the South African context);

- Supplementary storage and handling services;

- Bulk and retail focused businesses;

- *Mixed modes of selling – wholesale and commission.*

Investment in formal food markets grew drastically since 1900 as governments set out to formalise the facilities that provide food to cities. Markets such as Mercabana (Spain), Rungis (France) and markets in London, China, Korea, India and South Africa's network of fresh produce markets are examples of the international trend towards establishing large-scale infrastructure in major centres with the assistance of local government. Markets and specifically perishable food markets occupy a specific role in the cities that they serve and are central to trade.

> "At the heart of these observations is an evolutionary process in structural development, primarily aimed at facilitating more efficient vertical market co-ordination. This trend would appear self-perpetuating, as the more co-ordinated the markets are, the more costly errors become and more accurate co-ordination is necessary. Beyond expansion of ownership to different levels on the marketing chain, contracts and improved price discovery are used increasingly to facilitate this process of information transfer. Should this evolution continue, it is likely to lead to the emergence of food retailing chains, which will compete with and restrain the power of the existing wholesale markets; a phenomenon already at work in capitalist economies. Linked to this process is the observation of a cyclical component to this evolution, whereby food markets become firstly increasingly centralised, then decentralised." (Watson in Kohls & Uhl, 1990:205)

As an example, the markets in England were originally governed by decree of the king and were later taken over by local municipalities (See Table 7.3). In modern markets, local laws are created by the local municipalities to regulate markets. Ownership of the London markets lies with the Corporation of London. Each market has its own market authority and manages the operations.

Table 7.3: History of Leicester market from the year 1229
Source: Leicester Market (2015)

1229: By a Grant of Henry III, a fair of unknown origin that used to be held at Leicester in June was altered to February, or the day of the Purification of our Lady. The Grant was addressed to the 'Good Men of Leicester'.

1298: A very ancient market was held in the present Market Place. It was more extensive in former centuries than it is now. It was bounded on the northeast and southeast by the Town Walls and on the inside of the northeast wall ran a wide causeway known as the Corn Wall, where horse dealers displayed the pace of their animals. In the 16th century, some part of the Corn Wall was licensed for sheep pens.

1305: King Edward I granted to Thomas, Earl of Lancaster, a yearly fair to be held on the morrow of the Holy Trinity and 14 days afterwards.

1307: The Earl of Leicester had a fair of his own granted by Edward the Second in the first year of his reign. The fair was held on the morrow of the Feast of the Holy Trinity.

1351: King Edward III granted a market and fair to Henry, newly created Duke of Lancaster.

1360: By Royal Charter, the date of the fair was altered by King Edward III from May to Michaelmas. By a supplementary charter, the Duke of Lancaster himself granted to the mayor and burgesses the entire ordering of the fair (with reservations).

1375: John of Gaunt by the charter, which he signed in 1376 expressly included in his grant to the mayor, burgesses and commonalty of the town of Leicester. "… all manner of profits of portmoots courts of the fair and of the market of the said town and suburbs."

1473: Another fair was granted by Edward IV (May).

1540: Two new fairs were granted to the town by Henry VIII, by letters patent, June and December.

1547: Edward the Sixth confirmed the patents given by his ancestors Edward III and Edward IV for the Michaelmas and May fairs and Queen Mary, 1553, confirmed both the letters patent of Henry VIII and charter of Edward VI, assuring the two former fairs.

1558: Queen Elizabeth confirmed four fairs – Midsummer, Christmas, May and Michaelmas. The four fairs used to be formally proclaimed at the High Cross. The Mayor and Corporation walked in procession and at the cross, the town clerk read the charter creating the fair. The ceremony continued into the nineteenth century.

1622: William Burton enumerates five fairs, the previously mentioned four and a Palm Sunday fair. At this, a considerable show of cattle is reported. A low fair is also mentioned (a fair for cattle. In the eighteenth century, additional fairs for cattle and sheep were established.

1774: The cattle fairs held in May and October were ordered to be held in the present Horse Fair Street.

1895: The times of the May and October fairs were altered.

1902: The fair held in Humberstone Gate.

1971: Completion of egg-box style roof.

1975: Completion of existing indoor market building.

1984: Centenary celebrations.

1985: Medieval markets festival.

1992: Completion of existing roof. Opened by Bruce Forsyth.

1998: 700-year anniversary.

2002: Introduction of the permanent cafe and 15 further units on the outdoor market.

2005: Introduction of the Farmers' Market.

2009: Leicester Market crowned 'Britain's Favourite Market 2009′ in Nabma awarded public vote.

Table 7.4 demonstrates how another typical market environment in city centres had its origins.

Table 7.4: Development of a market
Source: Western (2015)

It all began at Kew Bridge one day in the 1880s, when a farmer's wagon loaded with produce from the fertile area around Cranford stopped at the Express public house to refresh himself and his horses. Whilst there, he was approached by local people wishing to buy his cabbages and the rest, as they say, is history. The spot quickly became a favourite shopping place for growers and a regular market emerged, initially on three days a week. Following a public enquiry in 1892, a two and a half acre site to the west of Kew Bridge was acquired and thus started the old Brentford Market. Extended in 1906 and 1921, the market flourished and gained its reputation as one of the finest in the country until in the late sixties, it became apparent that it had outgrown its location.

The Chinese government plays a direct role in the establishment of markets. The Chinese government views wholesale markets as serving four functions (Ahmadi-Esfahani & Locke, 1998):

- Broaden commodity separation;

- Bring the price mechanism into force;

- Satisfy transaction needs (save costs to consumers and increase the opportunities for transactions).

One has to make a distinction between wholesale food markets and smaller wet markets that serve end-consumers (see Table 7.5). Focus falls on the larger facilities that provide not only a sales environment but which is also part of a broader logistical chain. This will include the so-called bulk terminal markets. Wholesale markets are characterised by 12 months-a-year availability, produce that is sourced from multiple growers, specialised selling services and larger bulk volumes (Tracey-White, 1991b). These markets are typically referred to as wholesale spot markets. Spot markets also serve as price discovery centres in many of the food channels.

Table 7.5: Examples of wet markets
Source: Internet search

Kreta Ayer Wet Market, Singapore

Kowloon City Wet Market, Hong Kong

Or Tor Kor Market: Bangkok, Thailand

Dane County, Madison, Wisconsin

Dupont Circle, Washington DC

San Francisco, Ferry Plaza Farmers' Market

Within the Chinese context, the focus is principally on urban food security whereas the industrialised economies are focussing on the supply chain as a broader logistical network for the movement of goods and adding of value to products (Watson, 1996). This is also the focus in the South African context. As part of continuous marketing reform, wholesale markets play a pivotal role. Firstly, they provide products that otherwise would not be available in urban areas. Secondly, wholesale markets assist in providing a continuous flow of produce. Coordinating produce flow during seasonal and production cycles are a third function that wholesale markets perform. As part of the government's strategy, information management is essential. During 2012, the China Ministry of Agriculture embarked on a process to collect price related information (OECD, 2013) as they do not have a centralised information storage system as is the case in South Africa.

The consumption and production of food are spatially separated (Tracey-White, 1991a). It is in this context that the marketplace performs a consolidating function serving both the needs of a grower to market and sell and the need of the buyer to buy. This transaction occurs where the grower is not present. This creates an environment that is ripe for opportunism and we see this reflected in roles allocated to market authorities and the rules that govern formal markets (see agency theory discussed in Chapter 6). The consolidated information is disseminated either transparently or selectively back to the participants, who in turn rely on this to adapt the new information and adjust future decisions. Information is seen as a tool to govern the trust relationships on markets either as a regulatory requirement or as an administrative function. Markets as transactional hubs, also release information about the actions of the participants. Quantity, price and product information are examples of information that is generated as part of trading and feeds back to the grower.

Transparent price discovery is a challenge for markets as reflected by the experiences within UK spot markets where the market authorities have limited control and access to the actual transactions on these markets. This serves as an example where the authorities do not have control over the full life-cycle of the transaction and thus cannot influence the level of transparency to other stakeholders:

> "Therefore, best estimates have been made on the basis of the interviews and the analysis and interpretation of official import data. In particular, *getting meaningful price data from traders was virtually impossible.* Whilst the traders would indicate the value of the item, it was virtually impossible to compare it with other supply chains." (Accord, 2007:4*, own emphasis*)

Table 7.6: Various services offered by market facilities
Source: Internet Search

Market	Services (Value-add/Logistics)
Chicago International Produce Market: http://www.chicagoproducemarket.com/services.html	Ripening, Custom Repacking, Custom Packaging, Private Label programs, Full truckload services, Forward distribution, Cross-docking, Daily delivery
Union Square Farmer's Market, New York City: https://unionsquaremain.org/for-businesses/reference-tools/	The market has grown into one of the world's best, with more than 140 regional farmers, fishmongers, bakers and butchers catering to more than 60 000 shoppers on peak days.
St. Lawrence Market: Toronto, Canada – http://www.stlawrencemarket.com/	On Saturdays, local farmers sell seasonal organic produce at the North Market, a tradition that began in 1803 and continues today, presenting a wide selection of not just fruit and vegetables but locally produced cheeses, grains and meats. Embracing more than 120 vendors, St. Lawrence's South Market also sells imported items such as tropical fruits and avocados that are not easily grown in Ontario's chilly climate.
Lancaster Central Market Pennsylvania: http://www.centralmarketlancaster.com/	The United States' oldest, continuously operated farmers' market stands in the heart of Amish country in Lancaster, Pennsylvania. The historic market has been in operation since the 1730s and was granted permanent status by King George II in 1742. It remains popular today and tourists flock here to purchase handcrafted products and foods made by the local Amish community. While the Pennsylvania Dutch wares might be the biggest draw for out-of-towners, locals appreciate the wide variety of imported goods sold alongside local produce, fresh flowers, just-caught seafood and hearty baked breads.
GrowNYC: http://www.grownyc.org/	Thanks to continued funding from Speaker Christine Quinn and the New York City Council, as well as additional support from The Farmers' Market Federation of NY and the U.S. Department of Agriculture (USDA), GrowNYC has established a national model for operating EBT at farmers' markets and has greatly expanded food access in New York City. GrowNYC Annual Report 2010.

7.3 Development of modern wholesale markets

The fresh produce industry is the fastest moving of all Fast Moving Consumer Goods sectors and is exposed to an extremely perishable and fragile product (Benecke, 2007). Agricultural supply chain has however experienced large-scale consolidation in developing countries (Cook *et al.,* 2008). There exists a significant spatial component between the source of production and point of consumption, which can involve great distances and which requires efficient integrated supply chains. Supply is no longer limited to local production as buyers can source produce from 1000s of kilometres away. Improved infrastructure,

logistics and information allow role players in markets to extend their commercial activities across great distances. The larger role players are in a position to exploit economies of scale and to integrate vertically into the supply chain.

The fresh produce industry has some unique characteristics (Grimsdell, 1996; Taylor & Fearne, 2009). Taylor and Fearne (2009) highlight the fact that the characteristics of supply and demand are different to other manufactured products and they should not be approached in the same manner.

Boehlje (1998) suggests that there will be three categories of goods:

- Generic commodities, these are the standard packaged product for general consumption;
- Enhanced component commodities also called value added products;
- Specific attribute raw materials also called bulk delivered.

These in turn will be produced by three types of growers:

- Multiple plant entrepreneurs who produce technologically advanced products (varieties for example) in different locations;
- Franchise growers that produce on a contractual bases as part of a dedicated value chain;
- Networks of qualified suppliers specialising in particular processing operations.

Agents play a crucial role in servicing these growers to create and maintain the communication channels between growers and markets (Grimsdell, 1996). However, the fragmented nature and improvements in various technologies introduce the growth of more direct types of relationships and introduce various moral hazard and adverse selection issues highlighted by principal-agent theory. Large-scale consolidation in agriculture creates power nodes, which affect the way negotiations, contracts and subsequent price structures are established and maintained. Future markets will have to find solutions that marry this diverse set of circumstances with the right technology solutions.

According to Tracy-White (1991b), wholesale markets develop in stages:

- Start as general markets: Informal relations and unstructured facilities;
- Specialization in specific lines: Traders develop a niche and structure infrastructure accordingly;
- Move towards graded and standardised products: The formalisation of standards is generally driven by demand side requirements;

- Buyers develop their own channels directly to growers and invest in infrastructure. From a business point of view, these facilities work like mini markets but in a monopolised manner;

- Markets start to act as consolidation and distribution points for a broader vertically integrated channel (terminal markets). In cases where markets are not used as main price discovery vehicles, the role turns to one of complimentary services and infrastructure provision.

Figure 7.52 illustrates the structure of wholesaling occupying a consolidation point between producers and general retail. Figure 7.52 illustrates the relational channels that a formal retail sector creates in contrast with the wholesale channel. Each of these has their own dynamics, advantages and disadvantages. Within a fresh produce supply chain, these two models also interact with each other and are not completely separable.

The retailer that procures some of its product from markets and some from growers would be active on both. A common theme in the subsequent chapters on markets is the growing influence of retail on the re-structuring of the supply chain (Cook *et al.,* 2008). Figure 7.53 highlights the various combinations of the relationship between retail and wholesale channels.

Figure 7.54 illustrates the influence retailers had on the European wholesale markets. The policy of direct procurement and the ability of the larger retailers to build sustainable relationships direct with growers decreased the share of business channelled to wholesale public markets. In addition to procurement programs with growers, retailers also invested backwards into the supply chain to acquire production capacity that allowed them more direct control over their supply chain and costs.

With consolidation and relative strength of direct trade, spot market prices become less important (Hobbs & Young, 2001). However, in modern vertically coordinated supply chains costs plays the dominant role and the spot market supply and demand is more indirect.

In addition to retail, other factors shape the way spot markets are influenced and structured:

- Level of competition reduced;

- Number of buyer and sellers are reduced;

- Level of public intervention is limited;

- Level of regulation is reduced.
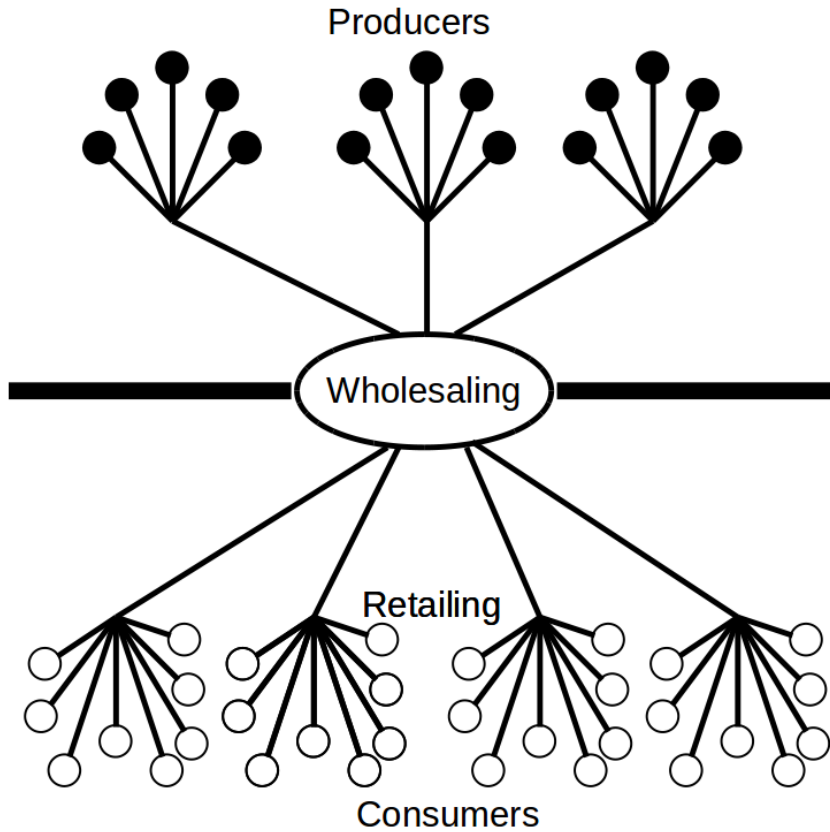
Figure 7.52: Retail/Farmer relationships
Source: Tracey-White (1991b)
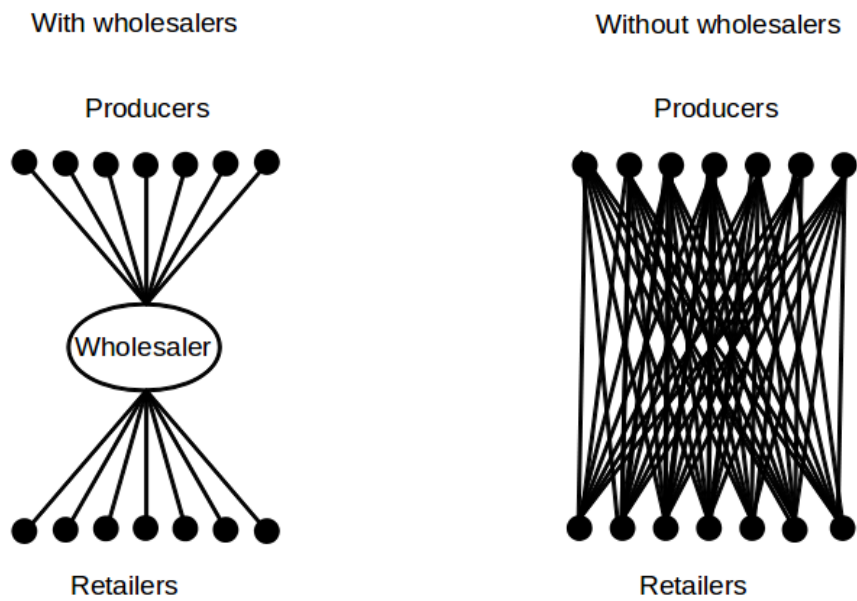
Figure 7.53: Impact of wholesaling
Source: Tracey-White (1991b)
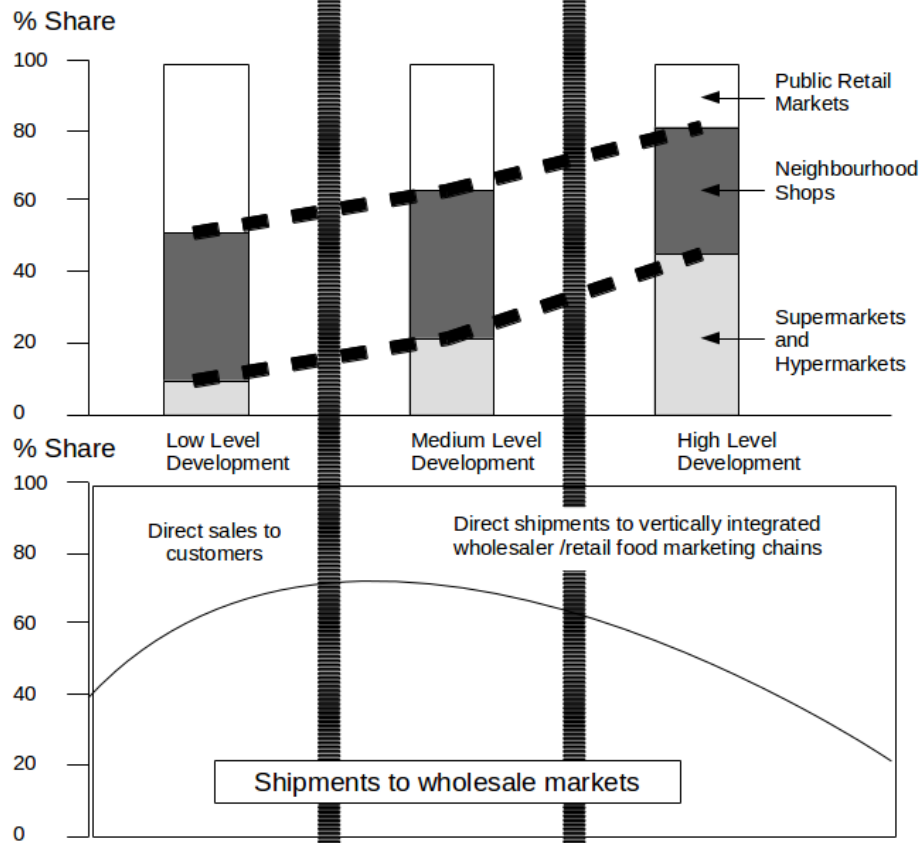
Figure 7.54: Changes in retail marketing patterns
Source: Tracey-White (1991b)

A general theme throughout the literature is that of food security. The liberalization of food policy surrounding markets combined with the growth of retail stimulated the emergence of alternative market structures but also diluted the ability of governments to influence the procurement and sales of food. The removal of state controlled marketing in China, Canada and South Africa had certain structural consequences, mainly in the introduction of more direct type relationships.

In Canada and the United States, the formalising of legislation had such a structuring effect on the channel. The passing of the 1929 Marketing Act and the subsequent establishment of marketing institutions during 1949 provided the ability to strengthen prices for growers (Davis, 1957). As these laws lost their relevance, they were replaced by liberal approaches to regulation and the power shifted to the demand side. From a production side there are forces pushing towards vertical integration (Hobbs & Young, 2001). In many agri-food chains, closer vertical coordination was sought for the following reasons (Hobbs & Young, 2001):

- To produce and deliver in a timely fashion the quality attributes demanded by the consumer;

- To communicate these attributes, many of which are invisible, to the consumer;

- To ensure that members of the supply chain are compensated for the costs involved;

- To meet regulatory requirements, both health and environmental;

- To meet associated concerns about liability.

The growth of retail channels since the 1980s are driving changes on an operational, commercial and strategic level (Cook *et al.*, 2008). Modern wholesale markets are still exposed to perceived inefficiencies, mainly due to a lack of infrastructure investment and strategic direction. The ability of state owned and/or controlled entities to compete with more hierarchical commercial structures is lacking.

The following extract offers an interesting observation from the 1913s and highlights the role of consolidation of demand and supply plays in the discovery of price (see Table 7.7).

Table 7.7: Example from 1913
Source: Levin (1913:157)

A strong tendency towards centralization has been noticed almost universally in these cities, as has a tendency for the market for wholesaling to grow greatly, while the district and subsidiary markets lag behind. What is the cause of this? It is the nature of markets to regulate prices by supply and demand. But supply and demand are only to be found where products flow together- that is in the chief market and not in the district and subsidiary markets that provide themselves with goods mostly from the chief market and as a rule are nothing but retail trading places like stores in the city. From this point of view, it seems wrong to separate the wholesaler and the producer and to locate the wholesaler in the chief market-hall while the producers are provided for in a subsidiary market. Both groups provide the supply and therefore belong together in the chief market. The mistake of separating the two groups was made not long ago in a city, where a chief market-hall was opened and the great difficulties that arose from this did not disappear until the producers and the wholesalers were again united in the chief market-hall.

7.4 Price discovery and its role

Price discovery is a core function of markets and is a frequent subject for research (Carlberg & Ward, 2003). Spot market-pricing forms the main market pricing mechanism of fresh produce on spot markets (Hobbs & Young, 2001). Developing commodity markets are directly affected by speculation and this is amplified when the buyers and sellers do not actually meet (Ahmadi-Esfahani & Locke, 1998). This section does not provide a full discussion on price discovery but merely to highlight its role in the functioning of spot markets as part of a proxy for action. Transaction and price risks increase with the dissemination of electronic markets (Alt & Klein, 2011).

Although the role of markets tend to be affected by direct trade between growers and retail, markets still operate and fulfil an important role in the marketing chain performing three essential functions (Tracey-White, 1991a):

- Supply and demand are consolidated – price is established;

- Choice is provided - quality, continuity, packaging and price;

- Feedback mechanisms are created whereby the signals from the above are fed back to the various role-players.

A distinction has to be made between price discovery and price determination. Price determination involves the broad supply and demand forces, which deliver an aggregated price level. Price discovery refers to the micro transactional activities where buyers and sellers discover prices, given a particular quantity, quality and price. The extent to which stakeholders trust the price determination ability of a market, contributes to its relevance. This applies to the internet as well.

> "... we may need to examine the relative importance of trust and price in Internet shopping. Previous research noted the importance of both trust and price perception in Internet shopping. However, little has been said about how price perception and trust work in tandem to shape the choice of the potential customer or the decision of the repeat customer, or how the influence of the two factors might be mitigated or enhanced for potential customers and repeat customers." (Kim *et al.,* 2004:412)

> "If a market is seen as a relevant barometer of price, then the market as an institution attains legitimacy. On the other hand, if the specific market loses its relevance, the trust in the important role of price discoverer also loses credibility (also called the thin market problem," (Kohls & Uhl, 1990:212)

Thus, the trust that stakeholders place in the integrity of the price that is discovered by a market has a direct impact on the trust perceptions placed in the institution. Institutional structures affect the activities of the participants and this in turn creates a collective price. Spot market prices are clearing prices generated within a broader market environment (Hobbs & Young, 2001) whereas contract prices are margin based prices and are negotiated between specific parties in a closed environment. Production costs have an indirect influence on spot markets as supply and demand forces dictate price. Power positions

affect both the spot market and the contract markets (Gebreselassie, 2012). Within well-functioning spot markets supply and demand forces reduces the sustainability of long-term monopolistic power positions.

Through the individualistic trade patterns of participants, all seeking to maximise their personal gain, a price is "discovered" that reflects the status of many sometimes totally independent variables. These variables are amongst others, local and production area weather patterns, supply and demand expectations, geographic position, macro-economic factors, profit motives, scarcity, quality, packaging, continuity, etc. Transactions are affected by (Hobbs & Young 2001):

- Product characteristics: perishability, product differentiation, quality variability and the addition of new (credence) characteristics;

- Environmental drivers e.g. technological, regulatory, socio- economic drivers;

- Quantity and price uncertainty for buyers and/or sellers;

- Frequency of transactions;

- Asset specificity;

- Complexity of the transaction.

See Table 7.8 for a list of factors that affect price discovery.

Table 7.8: Price discovery and formation on food markets
Sources: As indicated

Price discovery on South African markets (Section 7 (Report 1)):
•   Prices the previous day;
•   Prices and quantities on other markets;
•   Number of buyers;
•   Enquiries form buyers;
•   Quantity sold the previous day;
•   The day of the week.
Price formation in wholesale markets (Ahmadi-Esfahani & Locke, 1998):
•   Informal negotiation or bargaining (private treaty pricing);
•   Trading on organised exchanges or auctions;
•   Formula pricing;
•   Collective bargaining between stakeholders;
•   Administrative decisions between private and public agencies.
Price discovery on fresh produce markets (Cordes, 2015):

Supply side factors:

Product – variety/cultivar

- Ripeness (maturity) of the produce
- Storage capability/shelf-life of the produce
- Pre-harvest weather conditions in the production area
- Post-harvest weather conditions in the production area
- Packaging – protective, colourful, strong, neat
- Presentation – grading, sizing, colour, shape, packing
- Brand or producer name
- Grade – Class 1, Class 2, Class 3
- Size – Extra Large, Large, Medium, Small, Extra Small
- Count – for fruit packed in cartons
- Dependable transport from the production areas
- Exports – overseas markets
- Production seasons – early, late and normal
- Input costs – farmers are dependent on many overseas products and their costs
- Bio-fuels – as farmers convert land to crops for bio-fuels (possible future scenario)
- Land claims

Demand side factors:

- Consumers – The Customer Is King. This is where it all begins
- Types of buyers:
- Wholesalers/Distributors and re-packers – move large volumes
- Retailers/Chain-stores – generally want top quality
- Hawkers/Informal Traders – many of them add up to big business
- Institutions/Catering/Processors – special requirements
- Exporters – to our Southern African neighbours
- Weather conditions in the market area – hot for salads, cold for stews
- Prices offered by local wholesalers/retailers – buy direct and have special offers which compete with market prices. Mainly affects smaller markets.

General factors:

- Jo'burg Market prices – if Jo'burg sneezes other markets catch a cold
- Time of the year – the month – the week – the day
- Public holidays – before a long weekend prices usually go up
- Time of the month – availability of spending money, pay day
- Services and facilities of the market authority – to farmers & buyers
- Services and facilities of the market agents – to farmers & buyers
- Political and economic situation in the country – stability is essential

•	Socio-economic situation in the market area - unemployment
•	Distribution patterns between markets – speculators
•	Exchange rate – when the Rand is strong it does not pay farmers to export
•	Selling skills of the salesperson – some can "squeeze" better prices than others
•	Imports – very small, usually out of season
•	Eskom – if we continue with power load shedding
•	Global warming – seasons are changing as are crops and production methods

Table 7.8 offers an extensive list of potential influencing factors on price discovery. The commitment to transact represents action and this action is influenced by the above factors in addition to the other transactional aspects. Action is represented by a transaction but this transaction represents more than just the price paid for goods.

> "Transactions measure the degree of interaction between actors. They include information exchanges, group decision making, negotiations, etc., which take place between the actors." (Forgues & Thietart, 1997:5)

The above elements feed into the decision-making and credibility or the trust placed in the signals used for price discovery affects this relationship. Price becomes a signal that is used by users as part of their interaction with institutions and trust formation.

These transactions do not only conclude the sales agreement, but also involve information exchanges, price negotiations and market clearing. Transactions are the outcome and explicit proof of the intent of the participants.

> "The choice of transaction as a proxy is made because it is a good representation of the interactions between the actors involved in the crisis." (Forgues & Thietart, 1997:4)

The analogy of a crisis is relevant as the transaction represents some form of pressure and risk within a competitive environment. Conflict is ever present due to the "struggle between actors or collectives expressed as definite social practices" (Giddens, 1984:198) and is mirrored in the actions of actors. Different interpretations of meaning, power relations and norms affect the behaviour of actors and produce a variety of action/transactional outcomes (Walsham, 2002).

Price fluctuations could be a strength but also a weakness of spot markets. The strength (health) lies in the fact a fluctuating price more directly reflects a supply/demand situation on a particular period. The weakness lies in the risk it brings to growers to plan and ensure a profitable price. Ahmadi-Esfahani and Locke (1998) make the following important points regarding spot prices; *where buyers and sellers do not physically meet and/or the price is based only on a portion of the trade, the spot price volatility could increase.* Barahona, Trejos, Lee, Chulaphan and Jatuporn (2013) draw attention to the fact that farm-gate retail-price transmission (in Brazil) showed a positive asymmetric price transmission regardless of the levels of concentration in the market. Public facilities (slaughterhouses in this case) seemed to produce symmetric price transmissions and private facilities produced asymmetrical price transmissions. Within agriculture, asymmetrical pricing is a direct result of abusive market power practices and distorted price reporting practices. Gebreselassie (2012) argues that a significant amount of the price margin is distributed away from suppliers in this manner. Growers can receive as little as 25% of the final fee in channels where the bulk of the power is consolidated in only a few intermediaries.

> "Even during lean season that otherwise expected to increase competition among traders is not sufficient to challenge the monopoly brokers and wholesalers enjoyed during high supply season (which naturally favours buyers, The result indicates the existence of asymmetric price transmission along the value chain as well as the imbalance in market power between producers and brokers/wholesalers." (Gebreselassie, 2012:230)

Hobbs and Young (2001) asks what the relationship is between the growth in volumes through alternative market structures (such as contracts) and the relevance of the spot market price, specifically, what this minimum amount of volume would be to ensure the relevance of the spot market's price? In these situations, the spot market becomes thin and loses its value as an indicator of supply and demand. Alternative price systems pose significant challenges mostly related to transparency. Hobbs and Young (2001) provides two examples of these price structures. One is formula pricing in which the product price is not determined before the time but is based on a specific formula. This formula includes quantitative variables but also some qualitative measures to reach the price. The other example is a performance premium price. These prices are based on a base price but include additional premiums for aspects such as quality, delivery etc. Thus, the more *subjective measures* are introduced, the greater the difficulty in using the price as part of a broader price determination framework.

Issues relating to food prices have continuously been the focus of investigations into the South African produce sector, as the various NAMCs Section 7 investigations (see Chapter 8). Experience has shown that market prices continuously attract attention and suspicion, especially when they are high and or disruptive. Government's approach to administrating prices differs, ranging from a selective priority approach focusing on specific commodities, to a more indirect approach seeking to influence the trading environment. Whatever the level of involvement or the motivation, administrative influence on the trading environment affects the way prices are formed, the stability of prices and the structure of a market. The transactional environment offers us clues about the intention of the actors.

7.5 Retail and spot market consolidation

The fresh produce industry in Europe is characterised by more mature supply chains (Accord, 2007). Aspects such as labelling and tracking are required by the main retailers and have become part of the normal practise in those chains. Their size and power dictates to the supply chain what these standards should be backwards into the channel. As in all markets, the changing demographics of the European consumer is impacting on the way products are grown, packaged, stored, transported and retailed.

Self-service type supermarkets changed grocery shopping since its inception (see appendix B for the original self-service patent issued). Supermarkets have experienced significant growth in the 1990's and aggressively pursued central buying and consolidated distribution into regional distribution centres where the product is prepared for the display in the various retail outlets. Through this large scale economies of scale afforded retail buying power to approach growers directly and procure large amounts of produce in this manner. In Europe, this trend had a detrimental impact on the wholesale markets. This not only removed the demand side as growers would sign into supply contracts effectively removing supply from the market floors.

Asian food systems also experienced the changing role, specifically of retail, in their food channels (ASEAN, 2004,). Moving away from traditionally fragmented supply chains, the food systems seek to emulate the modern supply chains of larger retail chains internationally. A big driver of this is the role of large retail players such as Carrefour, Ahold and Walmart, which require more formalised processes and larger volumes. Consolidation in the UK supply chain is significant. Accord (2007) lists that an estimated 73% of total grocery sales are conducted through 6% of the retail outlets. Retail in the UK is thus a major player. The emergence of high-end retailers catering for the expanding middle-class' taste for fresh healthy

eating is re-shaping the role of traditional food markets (China, 2013). The relationship dynamics between the participants has also changed. Wholesale traders became customer focused whereas supermarkets have become grower focussed.

One aspect the Chinese markets are facing is the continuous growth of the retail and direct sourcing models:

> "A typical example is Carrefour. In the vanguard of direct farm sourcing, the retailer has partnered with over 460 farm cooperatives since 2007. Other hypermarket operators such as Wal-Mart, RT-Mart, Tesco, Metro AG, Wumart and China Resources Vanguard have undertaken similar initiatives and achieved remarkable successes in direct farm sourcing. This has in turn also helped farmers increase their annual incomes and improve the rural retailing landscape." (China, 2013:1)

This market/retail competition is nothing new as the following quote illustrates from 1913:

> "All these circumstances have brought it about, that retail sales in the market-halls have constantly gone back and that the district and subsidiary markets are losing importance." (Levin, 1913:158)

The emergence of more advanced technology has increased the scale of this trend of direct procurement from the grower. Retail and spot markets have their own unique characteristics (see Table 7.9).

Table 7.9: Spot and retail market characteristics

Spot Markets	Retail
Transparent but volatile price	Levels of price certainty
Flexibility due to low contractual obligations	Contractual agreements lock growers in
Fewer adherences to standards required.	Higher costs associated with specific standards and certification
Broader access to general market information	Limited to information provided by retailer.
Marketing costs higher due to daily decisions on where to send to.	Less marketing costs due to the larger regular volumes ordered in advance.

Retail aims to exploit economies of scale and follow a direct-from-the-farmer approach by creating central distribution centres from where the various retail outlets are then serviced:

This is illustrated by the following quotes:

> "Our decision to move to centralised distribution was motivated by changes in South Africa's retail landscape, which had seen us fall behind our competitors, who were investing significantly in their supply chains and in improved service to their stores through centralised distribution systems." (Pick and Pay, 2014)

> "The majority of our produce requirements are sourced as far as *possible directly from local producers* with the focus on a fresh promise to the customer. This practice also reduces transport and packaging costs and unnecessary handling through the use of returnable plastic crates. We operate our own network of distribution centres and refrigerated trucks; negotiate production contracts; source specialty fruit and vegetables on international markets and play a key role in equipping emerging farmers with the knowledge and skills to produce and meet international GLOBALGAP Standards." (Shoprite, 2014, *own emphasis*)

> "The supplier provides the DC with produce of uniform quality, under the requirements of the retailer. In line with the current trends of vertical integration and the decrease of the number of actors across the fresh produce supply chain the supplier became DC's exclusive European citrus fruit supplier. This consolidates the relationship and trust between the retailers, DC and the Spanish supplier and ensures that the produce is of the required quality." (Manikas & Terry, 2010:662)

Wholesalers were traditionally the link between grower and the value added role players such as packer, caterer and wholesalers. Wholesalers offer some valuable functions such as warehousing, transportation, product consolidation and inventory management. The effect of the growing grower-retail relationship on wholesalers was that they moved to selling lower grade product, less differentiated packing and requiring smaller quantities to buyers. It also diluted price transparency.

The power dynamics inherent in the new supply has certain effects. Market power tends to move to the retailer, who through various contractual agreements and buying power, can dictate price and to an extent what the marketing actions of the grower is.

Vertical integration took on the following forms (Gataulina, Uzun, Petrikov & Yanbykh, 2006):

- Setup of processing plants in production areas and trade with existing agri-firms: These initiatives were not successful and did not translate into continued investment into the rural areas. The challenge was also sales due to the distance to major centres and the lack of formal markets.

- Integration during privatization: 49% to 51% of stock was sold to suppliers and the balance made was available to the workers in these businesses. This initiative failed. The majority of these transactions were structured to give 51% to the workers. The facilities lost value and suppliers did not invest into the facilities themselves leading to the loss of value.

- Creation of agricultural cooperatives: This initiative also failed due to the large organisations not wanting to be part of this and the smaller farms being too fragmented and scattered. Smaller growers also had non-consistent production and low volumes, which made coordination difficult. The growers also did not trust each other.

- Creation of formal agrofirms and agroholdings: Agrofirms are legal entities that perform specialist functions. Agroholding companies in Russia control these agrofirms through the Decree of the President of Russian Federation on November 16, 1992. The firms suffered from financial management and general commercial profitability. The initial intention was to assist in the financial rehabilitation of the agricultural sector. The intention was to develop the agri-sector, rehabilitate bankrupt enterprises, provide fixed and current assets and to restore supply chain links. Although established by the government, control was transferred to private firms at a later stage.

Governance in the above examples is not just a function of the ownership of the markets. Contracting rules, either formal or informal, are used to coordinate the activities of the participants regardless of the ownership of the markets. Ownership of the facility allows for the implementation of additional rules that in turn creates institutional frameworks. The more aggressive and invasive these rules are, the greater the impact on the facility. These institutional rules are not automatic and have to be designed and implemented accordingly. A common aspect of markets is the use of committees for the day-to-day running of the facilities. The structure and mandate of these committees differ between the various scenarios, but the various markets each shape these to fit the particular case.

The above aspects have challenged the traditional way relationships are formed and maintained. The consolidation of the supply chain has multiple effects on the industries that supply it such as costs transfer through increased certification, packaging and slot times. The use of SST could differ significantly

depending on the type of customer that needs to be serviced. Institutional buyers and hawker type buyers differs greatly in the sophistication in which one has to service their needs.

Product and the variety of quality, continuity, packaging and price associated with the product generate product related signals. And lastly, the specific contract type and facilitation process underpins the activity that characterizes the market. These components as a collective form the institutional characteristics. The provision of SST needs to consider this aspect. The provision of signals via SST should include these various structural dimensions (transaction, product, assurance and contract) as was discussed within this chapter (See Figure 7.55). Traditional approaches to SST would focus on the transactional component. But the broader market institution requires the facilitation of additional signals to compliment the transactional workflows of such a facility. Information flows comprises more than just price level information. There is significant qualitative information on markets that forms arguably the most important aspect of information flows.
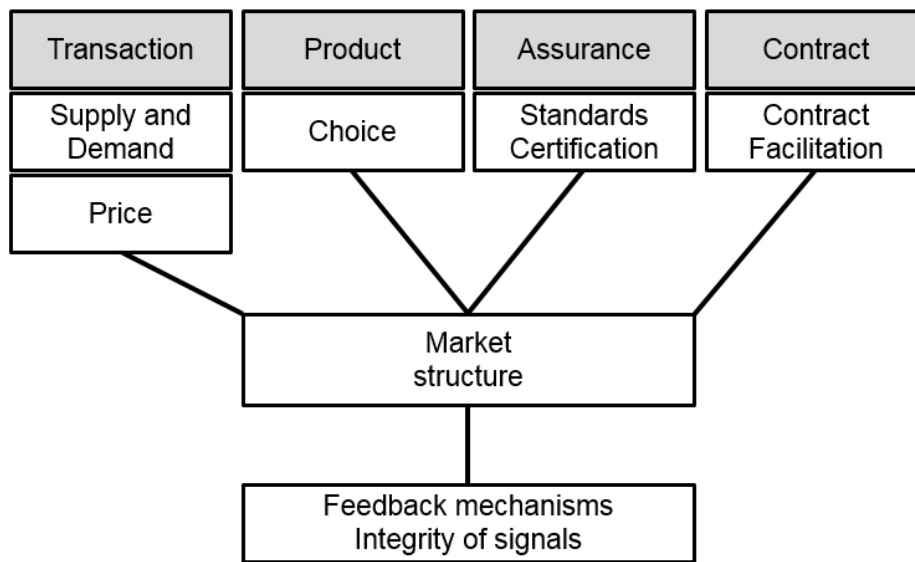
Figure 7.55: Spot market structural dimensions

Figure 7.56 illustrates the various dynamics of spot and contract pricing and the structuring role each play on the specific supply chain and market environment. Spot markets typically suffer from lower standards and more volatile pricing whereas the relationships typically found in a formal retail have a higher certification component.

Spot market

Wholesale markets

Grower

Lower grade product
Less differentitation
Smaller qty's / Higher volume of transactions
Diluted price transparency
Customer focussed

Thin market problem.

Contracctural production
Price discovery
Integration

Cost structure differs

Lower enforcement of standards

Super markets

Cost structure is different

Hedging function

Prompt payments

Power to the retailer
Pricing - dictate
Marketing- how the grower markets

Contract pricing

Contract enforcement

Cash flow

Grower focussed
Standards forced onto growers

Standards

Stable prices

Cost structure is different

Characteristics of UK supply chain

Quality and food safety management
Production efficiency
Cost control

High levels of consolidation
Distinction between certified and non-certified

Figure 7.56: Spot market and contract pricing

7.6 Concluding summary

In this chapter various issues surrounding the wholesale spot markets are discussed. The aim of the chapter is to introduce broader institutional aspects surrounding the functioning of these markets. Aspects like the development of modern markets, price discovery, third parties and the growing formalised retail channel are highlighted. The way the relationship between these stakeholders is structured affects the nature of power, governance and the use of technology on these markets. The transactional dimension generates price signals via supply and demand within the market what represents action. Wholesale type sales models where produce is bought and then re-sold, is by far the most prominent sales method on international food markets (where ownership changes from supplier to wholesaler). At the other extreme is the ad valorem sales commission model (ownership resides with the supplier). This model forms the focus of the following chapter.

Part 3: Case Environment

CHAPTER 8: SOUTH AFRICA's FRESH PRODUCE MARKETS

CHAPTER ROADMAP

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CHAPTER 8: SOUTH AFRICA's FRESH PRODUCE MARKETS

TABLE OF CONTENTS

Okay, everyone knows that the Net is changing everything . . . that's old news.

The savvy companies are already asking themselves: what comes next?

Chapter Two of the Internet will be about the mass proliferation of e-services.

[The Hewlett-Packard Company]

8.1 Introduction

This chapter introduces the South African fresh produce markets. South Africa has an established network of commission markets servicing a large portion of its fresh produce marketing channel. The institutional nature of these fresh produce markets was shaped by 80 years of near draconian regulations. The government of the day kept a very firm grip on the marketing of fresh produce, especially during the period of 1960 to 1990. The result is a market structure that facilitates a business model built around trust relationships that does not require formal contracts, subsidisation and administrative pricing interventions. The allocation of roles, the specific legal frameworks, ownership models and business model all were structured to support and enhance an environment characterised by low barriers to entry and exit, high levels of competition, control over the trading environment and transparent information flows. The ownership and funding of the market's infrastructure was provided by the municipalities (funded by the tax payer) and the revenue model (sharing in the commission income) allows the markets to generate revenue to maintain the markets. Little to no investment is required by the grower to take part in the market. This reduces the level of asset specificity and according to Bachmann and Inkpen (2011) this creates the perfect environment for institutional trust to flourish.

> "Institutional-based trust seems to be a tailor-made solution for markets on which products
> and services characterized by a low degree of asset specificity are exchanged." (Bachmann
> & Inkpen, 2011:30)

During the 1990s, the industry saw large scale deregulation. Faced with an increasing retail sector that favours direct trade over procurement from markets combined with various challenges relating to management and funding, the role and nature of markets are changing (Louw, Chikazunga, Haankuku, & Ndanga, 2009). Conflict of interest, fraud, lack of political will to enforce regulations, fragmented interest groups and lack of infrastructure investment, are all factors playing their part in reducing the relevance of the markets and diluting the socio-economic benefits these markets could offer future generations. Within the South African context an enormous amount of emphasis is placed on the role of trust within the fresh produce markets.

> "The potential for damage to the industry is enormous – particularly when so much takes
> place on the strength of a handshake. Mutual trust is vital." (Cordes, 1996:1)

"Markets are built on trust, that is why in many cases you find that a grower will stay with an agent or salesmen, he knows him and he has built up a relationship with him." [Interview Ref.: 1:4783]

Given the current challenges facing South African agriculture, specifically developing emerging farmers, food security and food safety, the building of technological tools through self-service would assist and strengthen the markets' relevance and socio-economic role.

This chapter introduces the role players and describes the relationship between them. In order to understand SST within this context the broader market environment, the relationship between role players and the services it offers needs to be analysed and understood. Actors are not merely transacting with other actors in a dyadic manner but also draws on the trading environment for the regulation of the activity. This context is vital to create and understanding for the institution and its various services it offers. This chapter also provides background to the various studies that was conducted into South African markets and demonstrates the gaps that exists surrounding studies into the use of technology and role of trust.

Unpacking the market environment one is reminded of the following observation by Roland Coase:

"If one unpacks the market system, like we will do below, one starts to appreciate the role that the building of these markets took. Also, the lessons one can learn from these structures on how to build a market environment that is a self-regulating trusting environment bringing with it a host of socio-economic benefits." (Coase, 2012)

The intention is not to be drawn into the various industry related arguments but rather to provide the reader with an overview of the broader major market dynamics. Literature on the South African fresh produce markets vary from academic papers to industry related investigations. Research into markets are generally motivated by socio-economic issues, efficiency, marketing, supply chain and anti-corruption or political agendas (See as an example Louw *et al.,* 2009). The literature is silent on technology and trust related aspects surrounding these markets and this thesis aims towards contributing towards this discussion.

8.2 Historical overview of South Africa's markets

In South Africa, the organised market is typically associated with Jan Van Riebeeck's arrival in 1652 in Cape Town (IMASA, 2012 *cf.*). The market was established to answer in the need of the passing sea trade and later, as the colony developed, in serving the local population. The market in Cape Town was held

adjacent to the Castle of Good Hope and later moved inland to the Green Market Square. As the various cities were established in South Africa, so did the establishment of market places. Legislation passed in the early 1900s allowed Government to delegate the responsibility of conducting markets to national and ultimately to local Municipalities. The legislation was in place since then in the form of a Local Government Ordinance of 1939. This was only repealed after 2000 in the case of Johannesburg.

By 1954, South Africa had 134 municipal markets. The markets fell under the local Town Clerk who in some instances acted as the Market Master. The Market Master was the sole agent who sold the produce on behalf of the growers through an auction method. This was the main form of price discovery on markets at the time. As agents were introduced, the role of the Market Master changed to that of the operator of the auction system and manager of the facility. As the markets grew and the volumes increased, the auction system became unsuitable to handle the large volumes and variety of produce and multiple buyers. Buyers were more sophisticated and their requirements required a faster and more efficient method of trading.

The out-of-hand or private treaty system of selling was first introduced on the Cape Town market in 1946. Initially growers opposed this form of selling due to the perceived lack of transparency and loss of control it might cause. Some markets employed a combination of the auction and out-of-hand system, selling first via the auction system (vegetables in crates) and then using the out-of-hand system to sell produce left over. In 1965, the Pretoria Market adopted the out-of-hand sales method and this system grew to become the standard selling system. Between 1970 and 1990 the auction system was phased out with only watermelons still sold on auction to this day.

> "The rational of moving away from the auction system was that people wanted a different solution, they no longer wanted the auction system. The out of hand system, was preferred because it was seen as the baby brother of the auction. What the producer community wanted was the concept of supply and demand and getting the best possible price based on those factors. So the out of hand system still retained some of the elements of an auction system but it changed the balance of power. Under the auction system the market management ran the auction and once there was a transition from market management on how the price was determined, with that there was a transition of power. What you have now as a result of that is you have pockets of salesman in the market that are very powerful and that to a large extent can dictate what happens on the market." [Interview Ref.: 1:4913]

The fresh produce market system in South Africa is unique in the world. Its uniqueness does not stem from the method of trade per se, but the institutional structure within which it operates (See Table 8.1).

Table 8.1: Unique attributes of the South African fresh produce markets
Source: Cordes (2015)

The features which make our 20 markets special are:

They all operate on the commission system;

They all (except for Joburg) use the Freshmark IT System;

They all submit monthly sales statistics to Tshwane market which makes them available at no charge;

Because they act on behalf of their principals (farmers) the market agents on these markets are regulated by The Agricultural Produce Agents Act. Act 12 of 1992. This does not exist anywhere else in the world;

The Act provides for a Fresh Produce Agents Fidelity Fund which ensures that a farmer can claim against the fund in the event of fraud or similar wrongdoing by a market agent. In other words, the Fidelity Fund guarantees the farmer's money under certain circumstances. Also unique in the world;

The Agricultural Produce Agents Council (APAC) administers the Act on behalf of the Minister of Agriculture, Forestry & Fisheries. Also unique in the world;

The Act also requires every business and person who acts as a market agent to register with APAC.

All fresh produce commission salespeople are required to complete a three module training programme to qualify for a licence from APAC;

The Act also requires every market agency to open a trust account at a recognised banking institution. The trust account has only one purpose: to control / manage the farmer's money. APAC requires monthly reconciliations of the trust account from every agency.

Finally, the Act requires are farmer to be paid within 5 working days after the sale of a consignment.

Given South Africa's unique mix of farmers – commercial and small-scale – as well as the challenges faced in agriculture, the commission system offers the most sustainable method of determining prices while protecting the interests of the farmers.

Providing quality income back to the farm is crucial to stimulating the production sector. To achieve this, low risk low cost market access is of paramount importance (White & Gorton, 2006). Cash flows back to the farms is a major concern. For this, prompt payments and stable prices are essential to reduce risk to farmers. Growers sending produce to the markets can be paid within 24 hours of their goods being sold.

Institutional structures have to enforce the trust relationships between the parties in an objective manner. Figure 8.57 illustrates the relationship between the different stakeholders. The market plays a broader role of enforcement; ensuring trust in the market is maintained. All stakeholders are linked by a trust relationship, either directly or indirectly.

"The market needs to be viewed as a collective, but regulated by some form of central market authority with the power and facility to control the electronic workflow of the transactional workflow. Within the physical market these structures facilitates the activities through the provision of integrated governance structures.

This has been institutionalised over many years, through the various boards, banana board etc., yes it was a monopoly, but this established the structure we see today, we see the power that is putting pressure on the system is the natural commercial powers, but we do

not have the strong policeman that uses their power to sustain the markets. We as agents do not have control over it. The natural powers will destroy the system." [Interview Ref.: 1:4890]

Trust relationships are not one-sided. For instance, the grower needs to trust the agents, but the agent also needs to trust the grower to deliver on time or adhere to product standards for example. The buyer trusts the agents as a representative of the grower when procuring product and relying on the reputation of that supplier. Specific trust that the buyer/supplier have in the market is also represented by the actions of the agent. If the agent acts opportunistically, the market as a whole is perceived as less trustworthy. The system needs to provide a certain level of structural assurance through these structures (McKnight *et al.*, 1998). The service environment of the fresh produce agent is characterised by well-established institutionalised roles and processes. Well-established processes and role definitions reduce opportunistic behaviour of participants. Various role-players on markets

Markets were created not only physical products, but for the various services that provide and deliver these products. Markets remain an essential link between production and consumption (FAO, 2011). Well-managed and functioning markets positively affect the cost of marketing to consumers. Inefficient markets lends to higher marketing cost, lower farm income and higher prices to the consumer. Inefficient markets also increase the risk of food safety, food accessibility and ultimately food security. South Africa's markets are structured in such a way that it encourages new entrants at a low cost and ensure constant flow of product. Entry barriers are low and the grower (and buyer) can easily enter the system without upfront costs (low levels of asset specificity). All costs are raised against the sales of produce. From a low base, the various entrepreneurs are able to establish businesses without large-scale infrastructure investments. This linked to a governance structure, enforced by market management and a highly competitive business model, leads to the stimulation of the markets as major food hubs.

The market management itself plays a facilitator role in the functioning of the market.

"We have to create a platform for trade. We have a policing function, because the grower is not here. Our biggest role is one of facilitation. On a personal level if we cannot stimulate business then you must not inhibit it. In my opinion this is a big issue on markets national, we must not block business. Sometimes we use the system to block business, an example after hours transaction, sometimes a buyer just want to fill his truck and if your system does not allow this then the system can restrict you." [Interview Ref.: 1:5749]

The market is characterised by four important role players (Figure 8.57). Suppliers that supply produce to the market for sale, agents that procure and sell the produce, buyers that buy produce and lastly the market itself that forms the governance/regulating structure within which these role players operate.
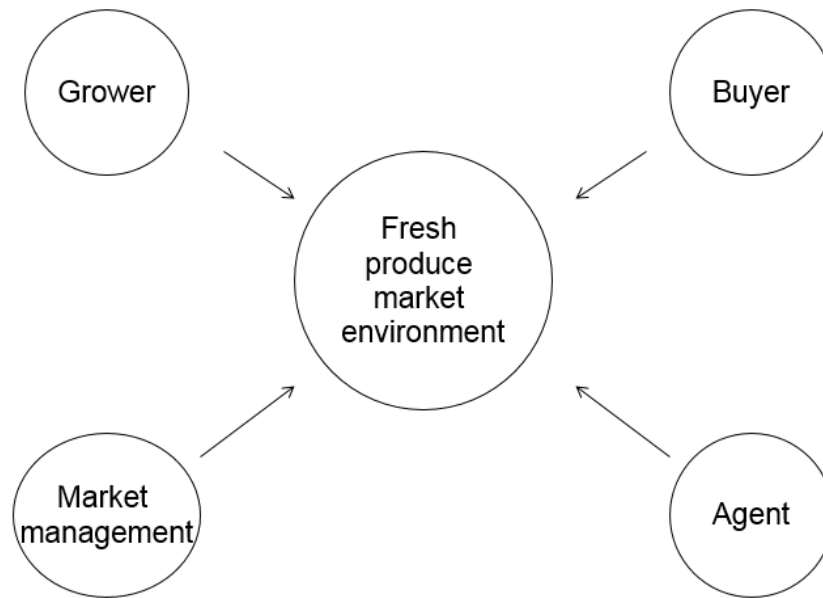
Figure 8.57: Key market stakeholders

The actions of each one of these players contribute towards creating the market as an institution. For the market to act as an institution, each one of these participants has to perform a specific role within certain parameters. Specifically from a management perspective, the enforcement of regulations provides the governance structure under which these parties operate. This relationship apart from being complicated is quite strenuous due to the markets direct relationship with city councils and the political influence this brings to a commercial enterprise. Market agents and market authorities serve the same customer namely the grower (who pays them via commission). A vested interest exists in keeping service levels up towards the grower, which has a structuring effect on the activities of both the agent and market management. Governance on markets are further strengthened by the establishment of the Agricultural Produce Agents council (APAC) mandated to specifically monitor trust monies of growers administrated by agents. These monies are in the hands of agents who are responsible for administrative and payment related functions to growers. APAC does not have direct jurisdiction over the market authorities who establish its own set of by-laws to govern the facilities but there is strong cooperation between these two bodies. This miss-

alignment has the potential to weaken the regulatory structures, as duplication exists of enforcement costs and administrative overheads.

Unfortunately, the high levels of trust required also imply an environment within which high levels of opportunistic behaviour exist. This was highlighted in 1996 when a full-scale Section 7 investigation (Section 7, 1998) into markets was launched due to the malpractice on the Johannesburg Fresh Produce market. With the importance given to agriculture and especially land reform, this sector is bound to see continuous interventions affecting markets and their structures.

The above structure forms an interconnected symbiotic environment in which trust acts as a cohesive element. This relationship is not a natural occurrence and requires the forces of stringent governmental influence and controls to ensure that all parties are performing according to their mandates. The manner in which these markets are structured and the roles and relationship formalised and governed makes this an interesting and unique institution. The central computer system plays a central role in how the various stakeholders interact with the institution.

8.3 Major studies into South African markets

The markets in South Africa has been the subject of various studies. But these tend to be at an institutional level focussing on the workings of the market mainly for use in policy formulation, not on the underlying aspects like trust and technology's role specifically.

8.3.1 CSIR Study

The most comprehensive research performed on fresh produce markets in South Africa has been the study conducted by the Council for Scientific and Industrial Research (CSIR – Originally known as the Human Sciences Research Council (HSRC)). This research was perhaps the most extensive ever concluded in the South Africa fresh produce industry and formed the basis for various subsequent investigations and studies. It was initiated in 1986 by the then commission for fresh produce markets (HSRC, 1991). The study was a broad-based study covering:

- Ownership of the markets;

- Price discovery;

- Distribution of fresh produce;

- Management and control aspects of the markets;

- The market for fresh produce in South Africa;

- Standardisation of the grading and inspection of fresh produce;

- Promotional matters relating to Fresh produce in general;

- Information aspects;

- Laws and regulations;

- Income and cost structures of various stakeholders in markets.

The main aim was:

- To gather information to assist policy and planning/management;

- To identify potential issues affecting the industry;

- To propose recommendations to assist growth of the industry.

The research comprised of:

- 7 100 questionnaires to growers;

- 11 500 to other parties;

- 80 focus groups;

- 22 presentations and memorandums were produced;

- International study trip.

The research resulted in the following 15 reports:

Table 8.2: Summary of CSIR studies into South Africa's Fresh produce markets.

Prysvorming by die bemarking van vars vrugte en vars groente in die RSA. *[Price forming during the marketing of fresh fruit and fresh vegetables in the RSA]* (Langley RGN [HSRC] c1991)

Distribusie van vars groente en vars vrugte in die RSA. *[Distribution of fresh vegetables and fresh fruit in the RSA]* (De Villiers and Van Deventer RGN [HSRC] c1990)

Riglyne vir die uitbreiding, opgradering, verskuiwing en sluiting van bestaande marke asook die vestiging van nuwe marke. *[Guidelines for the extensions, upgrading, movement and closure of existing markets and the establishment of new markets]* (Van Rensburg RGN [HSRC] c1991)

Standardisation of grading, packaging, labelling, palletisation and control systems in the fresh produce industry in the Republic of South Africa. Louw, Birkby and Steenekamp RGN [HSRC] c1991)

Inligtingsaangeleenthede met betrekking tot die bemarking van varsprodukte in die Republiek van Suid-Afrika. (Buro vir Finansiele Analise Universiteit van Pretoria 1991) *[Information matters pertaining to the marketing of fresh produce in the Republic of South Africa. (Bureau of Financial Analyses University of Pretoria)]*

Bylae B: Inkomste- en kostestrukture van die nasionale varsproduktemarkte in die Republiek van Suid-Afrika Buro vir Finansiele Analise Universiteit van Pretoria 1991) *[Appendix B: Income and cost structures of the national fresh produce markets in RSA (Bureau of Financial Analyses University of Pretoria)]*

Inkomste- en kostestrukture van nasionale varsproduktemarkte in die Republiek van Suid-Afrika.Pretoria RGN c1991) *[Income and cost structures of the national fresh produce markets in RSA (HSRC)]*

Die Inkomste- en kostestrukture van markagentskappe in die Republiek van Suid-Afrika RGN c1991) *[The income and cost structures of market agents in RSA (HSRC)]*

Eienaarskap van nasionale varsproduktemarkte in die Republiek van Suid-Afrika LHA-Bestuurskonsultante RGN c1991) *[Ownership of national fresh produce markets in the RSA (LHA Management Consultants HSRC)]*

Aankoop en verbruik deur private huishoudings in die metropolitaanse gebiede Martins RGN [HSRC] c1991) *[Purchasing and consumption by private households in metropolitan areas]*

Aankoop en verbruik van vars groente en vrugte deur institusies in die RSA Martins RGN [HSRC] c1991) *[Purchasing and consumption of fresh vegetables and fruit by institutions in the RSA]*

Reklame aangeleenthede met betrekking to die bemarking van vars groente en vrugte in die Republiek van Suid-Afrika Departement Bedryfsekonomie. Universiteit van Pretoria 1991) *[Promotional issues pertaining to themarketing of fresh vegetables and fruit in the RSA (Department of Business Economics University of Pretoria)]*

Laws, by-laws and regulations, which apply to fresh produce markets and the marketing of fresh produce. Miller HSRC 1991)

Funksionarisse, bestuurstelsels en bedryfsvorming op die nasionale varsproduktemarkte in die Republiek van Suid-Afrika Buro vir Finansiele Analise Universiteit van Pretoria 1991) *[Functionaries, management systems and forms of business in the national fresh produce markets in the RSA (Bureau of Financial Analyses University of Pretoria)]*

Fresh Produce in South Africa. Main report: Marketing fresh produce in the Republic of South Africa. Marx HSRC (1991)

A key comment from the study was:

"A *system approach is necessary* because producers, market owners, market management, market agents, control boards, wholesalers, small enterprises, consumers and the

Department of Agriculture and other parties are *dependent on each other needs to cooperate to form a whole.*" (HSRC, 1991:1)

The study was conducted in a time when the processes on the markets were still manual (sales were done on paper by hand). Focus was placed on marketing, ownership, cost structures and pricing, which were all non-technology issues. The introduction of technology on markets only gained momentum in 1990s and concluded around 1996 with the last market (and the second biggest) receiving a computerised system in 1996. So the study did not focus on technology specifically, but did highlight the importance of information on markets.

The industry today still operates the same manner, thus there would be certain aspects that are still relevant today. Markets still perform the following functions:

- Collection and oversight of all monies collected;

- Consignment control;

- Recording of sales transactions;

- Collection of cash;

- Provision of debt;

- Payment of trust monies from sales;

- Consolidation and distribution of sales information;

- Security;

- Maintenance of the facility;

- Cleaning of the facility including sales areas;

- Traffic control;

- General management;

- Storage facilities.

The above points illustrates the multi-faceted nature of service provision on markets of which the actual transaction is but one component of it.

8.3.2 Section 7 Investigations

Various investigations are initiated under a legislative mandate exercised by the National Agricultural Marketing Council. These are typically referred to as Section 7 investigations due to the mandate stemming from the powers vested in the National Agricultural Marketing Council through the Marketing of Agricultural Products Act No. 47 of 1996. It states under section 7:

> "7 - 1) The Council may appoint one or more committees to advise the Council or to perform such of the Council's functions as the Council may entrust to it". (South Africa: Marketing of Agricultural Products Act No. 47 of 1996)

Numerous investigations were conducted and these are listed in Table 8.3:

Table 8.3: Various investigations into fresh produce markets

- Ministerial Interim Committee (MIC) 2009: The MIC report – Derived from the various recommendations.

- Section 7 Reports - 2009

- Section 7: National Fresh Produce Markets

- Section 7 Reports – 2006: National Fresh Produce Markets Section 7 Investigation Final Report

- Section 7 Reports - 2005

- Section 7: Global Trends in Fresh Produce Markets

- Section 7 Reports - 2002: The Investigation Into Fresh Produce Marketing Report

- Section 7 Reports - 2000: Fresh Produce Study 2, Fresh Produce Marketing in SA– December 2000

- Section 7 Reports - 1998: Fresh Produce Study 1, Johannesburg Fresh Produce Market– October 1998

The Section 7 investigations offers insight into industry dynamics and is relevant to this study as it contributes to the context of markets highlighting the importance of these markets. Initial investigations in this context were launched due to complaints received during 1997 against the functioning of fresh produce markets. Phase 1 (completed in 1998) of the investigation focussed specifically on the operations of the Johannesburg Fresh produce market, specifically:

> "…to consider whether the Johannesburg market promotes the efficient marketing of fresh produce between the producer and the consumer." (Section 7, 1998)

The terms of reference of these investigations were as follows (Section 7, 2006):

- How does the Johannesburg market compare to the alternative marketing channels for fresh produce in South Africa?

- Is it one of a number of distribution channels competing on an equal footing, or is it in some way dominant?

- If there is dominance of some sort, is it supported by statute in any way?

- How does the market operate? Is there ease of entry to the market, whether as a producer, an intermediary, or a buyer? If there is not ease of entry, how is entry determined and how are the privileges of entry prevented from being excessive?

- How are prices determined on the market? Is the price formation process efficient, equitable and transparent?

- Who owns the market? Is there a conflict of interest or any other problem arising from ownership?

- Concerns regarding the apparent slow pace of transformation of NFPMs Market access problems highlighted by black producers;

- Concerns regarding the apparent declining competitiveness and efficiency of NFPMs (as a marketing channel) in the light of their important role in providing a service to low-income consumers and the informal sector and providing a service to consumers, producers and other stakeholders in South Africa;

- Ensuring the long-term competitiveness of NFPMs and effective supply chain management;

- Facilitating transformation of NFPMs in line with government objectives and guidelines;

- Flexibility – NFPMs should be in a position to adapt to the changing demands of customers;

- *Where possible, facilitating the standardisation of legislation across NFPMs;*

- Ownership: Separated ownership and management: Department/business unit option, corporatisation, municipal entities, public entities, divestiture/private entity, municipal public–private partnerships (PPPs), a combination of the above;

- *The commission system: The argument of commission and wholesale models has always been an issue. The report has suggested that the specific market decides on a model, but both cannot exist together.*

- *Price discovery and transmission: Price discovery is important and the price trends indicate a healthy system;*

- Transformation is lacking;

- Infrastructure investment;

- Coordinating body: A need for a centralised policy and strategic vision is important. Also as far as the legal frameworks is concerned;

- *Legal framework: The standardisation of by-laws;*

- Ownership and management.

This lists a significant number of issues but excludes issues relating to the importance of the underlying computing networks to strengthen the functions of markets. This is an oversight as the future of these markets can directly be linked to its ability to operate within integrated supply chains. The markets have unfortunately not kept pace with growing direct channels. Major pull and push factors are gaining dominance of formal retail, increasing demand into Africa, price certainty through contractual relations and export growth. The inability of municipal markets to re-position themselves as facilities has the potential to reduce their relevance in the supply chain.

> "The MIC in essence found that there is a general decline of the NFPMs in terms of growth in market share and infrastructure. The MIC proposes that the Minister of Agriculture, Forestry and Fisheries establish a Fresh Produce Market Development Agency (FPMDA) for the purpose of transforming, coordinating, regulating, marketing, enhancing access and improving the functioning of NFPMs." (MIC, 2009:6)

This re-positioning of markets is set to continue as a goal of both government and private enterprises.

8.3.3 Regoverning markets

The most recent series of studies into markets within the Sub-Saharan area is a range of studies entitled: Regoverning Markets. This series of studies were initiated to look into how the structure of food markets have changed and what the impact it had on the industry especially emerging growers. For this study this series is only partially utilised as the studies do not focus on technology and its implementation specifically but are informative and provides valuable background on a socio-economic level (See as an example Louw, Ndanga, Chikazunga, Haankuku & Ndanga, 2009; Louw, Nhemachena & van Zyl, 2008).

8.4 Overview of national markets

An overview of the various markets is provided in Figure 8.58. From the above one can clearly see the dominance of the Johannesburg market (39.04% of mass), Both the Johannesburg and Pretoria markets are situated within 80 kilometres of each other in the Gauteng Province selling 58% of national mass. The top four markets jointly sell 77% of national mass. Trade however, still occurs around these markets for which there are only vague estimates available.

MARKET	VAL (RAND)	MASS (TON)	% OF TOTAL MASS
JOHANNESBURG	5,211,756,920	1,211,957	39.04%
PRETORIA/TSHWANE	2,407,706,031	594,194	19.14%
CAPE TOWN	1,201,047,165	296,673	9.56%
DURBAN/ETHIKWENI	1,133,208,084	292,037	9.41%
SPRINGS	335,896,867	99,520	3.21%
PIE	313,567,337	87,281	2.81%
BLOEMFONTEIN	340,350,090	84,684	2.73%
EAST LONDON	339,865,590	83,809	2.70%
PORT ELIZABETH	303,882,271	83,432	2.69%
KLERKSDORP	302,492,508	83,425	2.69%
VEREENIGING	150,296,129	46,647	1.50%
WELKOM	175,823,154	46,248	1.49%
MPUMALANGA	103,785,752	28,797	0.93%
KIMBERLEY	69,433,959	18,558	0.60%
WITBANK	55,497,839	16,490	0.53%
UITENHAGE	29,258,557	10,779	0.35%
GEORGE	23,613,945	8,914	0.29%
KEI	24,178,877	7,575	0.24%
NELSPRUIT	12,264,609	3,414	0.11%
TOTAL	12,533,925,682	3,104,434	

Figure 8.58: National Fresh Produce Markets - Annual Turnover and Mass Jan-Dec 2013.
Source: Data file (2014)

The various national markets and their ownership structures are indicated in Table 8.4.

Table 8.4: Ownership of main fresh produce markets in South Africa.

Name of Fresh Produce Market	Ownership
Mangaug Fresh Produce Market (Bloemfontein)	Municipal
Butterworth Fresh Produce Market	Municipal
Cape Town Market (Pty)Ltd	Private
Durban Fresh Produce Market	Municipal
East London Fresh Produce Market	Municipal
George Fresh Produce Market	Private

Johannesburg Fresh Produce Market	Corporate
Kei Fresh Produce Market, Mthatha	Municipal
Klerksdorp Fresh Produce Market	Municipal
King Williams Town Fresh Produce Market (Gordon W Hall King Market)	Municipal
Mpumalanga Fresh Produce Market Nelspruit	Private
Nelspruit Fresh Produce Market (Laeveld)	Private
Noord-Einde Fresh Produce Market	Municipal
Pietermaritzburg Fresh Produce Market	Municipal
Port Elizabeth Fresh Produce Market	Municipal
Sol Plaatje Fresh Produce Market	Municipal
Springs Fresh Produce Market	Municipal
Tshwane Fresh Produce Market	Municipal
Uitenhage Fresh Produce Market	Private
Vereeniging Fresh Produce Market	Municipal
Welkom Fresh Produce Market	Municipal
Witbank Fresh Produce market	Municipal
Philippi Market	Private
Ugu Market	Private
Somerset Wes	Private
Epping Market	Private

It is important to note that the growers pay collectively for the facility and services received. In return, the grower retains a level of control of a transparent system into which they can entrust their produce on a daily. This arrangement provides a low risk and low cost marketing option for growers.

Figure 8.59 shows the product mix that is sold on all these markets. The five top products represent 65% of total mass sold. From Figure 4 the growth of the markets is evident. The increase from R3 billion (2000) to R12 billion (2013) represents a value growth of 229%, mass growth of 13% and a price growth of 190%. The reasons for the anomaly are multiple. Firstly, on the supply side, South Africa's agriculture is not a subsidised environment. South Africa has seen a decline in grower numbers, due to operational and costs issues and due to the continuous introduction of the land claims policy and related initiatives. On the

demand side, South Africa has seen large-scale influx of people from other African countries. This combined with urbanization and normal population growth has led to a significant increase in demand for fresh produce. Fresh produce is a basic element of South African's diets and this is reflected in the Figure 3 showing that the top commodities; potatoes, onions, tomatoes, bananas and apples are consumed as bulk commodities (not packed in high value packaging, One could argue that the three figures paint both a fortunate situation in which South Africa is able to feed its growing population, but that it also indicates a potential risk on the supply side. Without increased supply, the high demand will translate in higher prices and in turn could reach a stage that these prices become unsustainable. The fresh produce marketing channel presently operates under low-level central regulation, but if higher prices lead to social unrest, the temptation would be to interfere directly on the supply and marketing side. This could lead to non-market related actions, which in turn could lead to inefficiency and potential destruction.

	PRODUCT	VAL	MASS	R/TON
1	POTATOES	3,495,445,168	1,035,580	3,375
2	ONIONS	1,140,559,168	332,888	3,426
3	TOMATOES	1,344,279,514	266,652	5,041
4	BANANAS	1,097,643,639	251,453	4,365
5	APPLES	891,472,523	159,896	5,575
6	ORANGES	265,185,027	127,674	2,077
7	CARROTS	361,389,229	113,987	3,170
8	CABBAGE	216,628,325	104,420	2,075
9	BUTTERNUT SQUASHES	269,034,419	93,632	2,873
10	WATERMELONS	120,742,516	59,331	2,035
11	PUMPKINS	106,070,531	49,392	2,148
12	PEPPERS	304,997,980	43,749	6,972
13	PEARS	223,679,512	40,940	5,464
14	BEETROOT	143,689,665	37,227	3,860
15	SWEET POTATOES	96,135,417	35,358	2,719
16	HUBBARD SQUASHES	49,498,343	25,414	1,948
17	LETTUCE	117,932,565	24,610	4,792
18	PINEAPPLES	115,115,797	23,654	4,867
19	AVOCADOS	177,207,211	20,489	8,649
20	GRAPES	195,866,242	19,423	10,084
21 – 157	OTHER	1,801,352,891	238,663	7,548
	TOTAL	12,533,925,682	3,104,434	

Figure 8.59: Product ranking of national sales on South Africa's fresh produce markets, Jan-Dec 2013 Source: Data file (2014)

One of the key motivations for the market to enforce the usage of the computer system is ensure the market controls the money flowing through the facility:

'In order to prevent cash handling from taking place on the trading floor and ensuring that 5% commission is collected, cashiering facilities are provided by the market. It includes deposits, refunds, account payments, management of RD cheques and printing of buyer statements.' (Field Notes)

"The Cape Town Market employs a trading system, *which enables it to act as a central* point of price determination for produce based on supply and demand. This keeps pricing fair and makes the market an attractive trading place for buyers and producers alike." (Cape Town Market, 2015)

Table 8.5: Industry Growth Jan-Dec 2013 per year
Source: Data file (2014)

YEAR	VALUE (RAND) 'Billion	MASS (TONS) 'Million	RAND/TON
2000	3.798	2.735	1389
2001	3.874	2.800	1384
2002	4.861	2.638	1843
2003	5.261	2.642	1991
2004	4.713	2.563	1838
2005	5.682	2.876	1975
2006	6.182	2.900	2132
2007	7.572	2.820	2685
2008	7.855	2.897	2711
2009	9.569	2.775	3447
2010	9.656	3.045	3170
2011	10.061	3.025	3326
2012	10.850	3.138	3457
2013	12.533	3.104	4037
Growth (2000 to 2013)	229.94%	13.48%	190.74%

The dynamics surrounding contract facilitation forms an important undertone to the discussion of trust. Contract facilitation performs a natural assurance function supporting the various transactions. Clear boundaries and role allocation is important to create such an environment.

Markets and the consolidation of supply and demand are something that occurs in all industries regardless of the type of product that is traded. Within fresh produce, however it is striking how similar produce markets all over the world look and feel. The South African fresh produce markets unique in comparison with overseas models because South Africa has a highly structured selling system based only on commission sales within a carefully structured governance environment facilitating low cost and transparent information flows. The commission system SA trades under was created intentionally to capture the essence of the various role players and was driven by factors such as food security, food safety, competition and regulatory control. Revenue to both facility and agents are generated through commission sales on fresh produce and not via a typical buy/sell model and landlord model.

The above broad approach is required due to the unique nature and functioning of fresh produce markets in South Africa.

- In order to understand trust dynamics these broader aspects have to be viewed in context of the market's role not just as a transactional entity but also as a facilitator of exchange services.

- SSTs is not a separate from the underlying business processes and the model it supports. One can automate many of the processes but the rules, requirements from management and the customers drive the technology, which serves the business processes.

- There are strict rules and regulations, which govern the structures and actions within institutions.

There are multiple stakeholders and users on these markets each performing and interacting with the market environment in a different manner.

The following sections looks more closely at four of the major markets in South Africa.

8.4.1 Johannesburg Fresh Produce Market

The history of the Johannesburg market is a good example of how fresh produce markets evolved as institutional structures. The market in Johannesburg has its origins in what was called Market Square in the centre of Johannesburg in 1889-1893 (Johannesburg Annual report, 2013 *cf.*). The motivation was to provide a centralised easy accessible point of sale for both producers and buyers. The market operated on a barter system and sold a variety of products including fresh produce, poultry, game, lucerne and pheasants. Due to continuous growth, the market was moved to Newtown (in 1913) where the auction system replaced the barter system. A local government ordinance (No. 17 of 1939) was issued in which various powers and duties of municipal councils were detailed. The ordinance provided for the

establishment, construction, maintenance, regulation and carry on "markets" and made provision for facilities and amenities as the council deems suitable. Further that all revenues and expenses directly related to the market be kept in separate accounts and any surpluses be used for the upgrading and growth of the market unless prior permission is obtained from the Administrator for alternative uses. The ordinance (since repealed 2006) further provided the powers to prohibit the establishment of any produce market within the jurisdiction unless permission is granted by the council.

In the early 1970's the Johannesburg City Council resolved to move the ever expanding operations of the market to its current site in City Deep where trading commenced in September 1974. By 1988 the market consisted out of 4 trading halls focussing purely on commission sales of fresh produce (Potatoes, Onions, Vegetables and Fruit, The fresh produce were complimented by a variety of wholesale businesses trading in meat, fish, dry goods and groceries, liquor and fresh produce value adding and distribution. During 1996 claims of large scale corruption were levied against players on the market which lead to a series of investigations initiated by the NAMC (under Section 7 1998– discussed elsewhere).

During 1999 the council determined that the business of the Johannesburg Fresh Produce Market is no longer seen as a core competence of the City Council and a process of privatisation was pursued. The proposed privatisation did not happen and very limited investment were made into infrastructure. In addition newly appointed management lacked the required industry experience leading to a period of systematic erosion of the market's strategic position in the value chain. During this period maintenance and other operational obligations of the market continued to deteriorate to the point where large retailers viewed the market as unhygienic, non-conforming to standards and best practices and not aligned to their logistical and procurement requirements (traceability, standards, grading, quality assurance, certification, logistical integration, As a result large retailer embarked on a strategy of creating direct relationships with the supplier and to expand their own procurement and distribution resources.

As part of the iGoli/Egoli 2000/02 plan, the market was formally classified as a non-core business by the Greater Johannesburg Metropolitan Council , corporatized in July 2000 and renamed as the Johannesburg Fresh Produce Market (Pty) Ltd. The market is managed by a Chief Executive Officer reporting to a board appointed by the City Council. The Johannesburg Metropolitan Council remains the sole shareholder of the Johannesburg Market. In 2009, the market was re-branded from the Johannesburg Fresh Produce Market (JFPM, 2013) to the Joburg Market. Although the market has made strides in improving the status-quo, the challenge posed by the establishment of institutional relations between growers and retail is a

threat. Using technology in creative manner can assist in strengthening these positive aspects that markets provide.

The provision of services by markets has to consider this link to a broader social economic mandate. Markets operate in a broader socio-political environment, but have less direct control over the activities and operational aspects of the produce trade.

> "The Joburg Market finds itself exposed to complex agricultural regulations. The client base of JFPM is diverse, widely dispersed and stakeholders interpret legislation/policies/ regulations in different ways." (JFPM, 2014:56)

The Joburg market performs a price discovery and a distribution function for fresh produce:

> "An important by-product of the market's trading system is the provision of established prices upon which trading, both through the market and outside the market system, can be based." (JFPM, 2015:1)

Image 8.60 shows the trading floor of one of the halls of the Johannesburg market. The halls can be seen in Image 8.61. The other markets in South Africa looks very similar to these as they are all operating in the same manner.

Image 8.60: Johannesburg Market Floor
Source: Field Notes

Image 8.61: One of the trading halls, Johannesburg market
Source: Field notes

8.4.1.1 Revenue model

Johannesburg is the largest fresh produce in South Africa and one of the largest in the world by volume. Although other markets are bigger, international markets also tend to sell other products. It is situated 5 km south of the central business district of Johannesburg. The Johannesburg market serves approximately 5 000 farmers at any given moment and a large buyer base of approximately 10 000. Market revenue is derived from a 5% commission percentage on gross sales with agents charging between 5% and 9.5% (negotiated). On average agents' commissions are approximately 7.5% translating in a commission charge of roughly 12.5% to the grower (This is excluding sundry facility deductions). There are three main trading halls: Vegetables, Fruit and Potatoes and Onions. The total trading space is approximately 60 000 m^2 with additional expansions being planned. The market is responsible for the facilitation of trade through the provision of infrastructure, management, central computerised system, cash management, cleaning, food inspection services and security.

8.4.1.2 Food traceability

Food traceability is an important focus point for the market to ensure compliance with the relevant local and national regulations related to produce marketing. Producers by law have to ensure that produce consigned to the market conforms to the prescribed packaging standards of the Marking Requirements published by the Department of Agriculture (DAFF). The introduction of a Food Business Operator code (FBO code) by DAFF through which all produce is traceable back to its source, seeks to ensure food safety, quality standards, sanitary and phytosanitary requirements are met.

8.4.1.3 Regulatory environment

The regulatory framework in this aspect comprises a multitude of frameworks.

Table 8.6: Johannesburg Market Regulatory Framework
Source: Field Notes

Section	Framework
Municipal Entity	JFPM is a municipal entity contemplated in section 1, read with sections 86B (1) (a) (i) and 86D (1) (a), of the Municipal Systems Act (32 of 2000), ("MSA",
Organ of State	FPM is an "organ of state" as defined in section 239 of the Constitution of South Africa (108 of 1996) read with section 1 of the Institution of Legal Proceedings Against Organs of State Act (40 of 2002,
Municipal Finance Management Act	Contracting with JFPM is subject, amongst others, to the Municipal Finance Management Act (56 of 2003) ("MFMA"), the MFMA Supply Chain Management Regulations (GN 868 in GG 27636 of 30 May 2005) ("SCM Regulations") and, specifically, JFPM's Supply Chain Management Policy made in terms of section 111 of the MFMA and regulation 2 of the SCM Regulations (collectively referred to as the "SCM Regulatory Framework",
Consumer Protection	The Consumer Protection Act (68 of 2008) does not, in terms of section 5(2)(a), apply to any transaction in terms of which goods or services are supplied to the State. However, section 5(5) stipulates that notwithstanding the foregoing exemption, those goods and the importer or producer, distributor and retailer of those goods are nevertheless subject to, amongst others, the provisions of section 61. Section 61 sets out the liability of the producer and/or supplier for any harm caused wholly or partly because of a product failure, defect, or hazard in any goods, irrespective of whether the harm resulted from any negligence on the part of the producer, importer, distributor, or retailer, as the case may be. In terms of subsections 61(5)(c) and (d), harm for which the Contractor may be held liable includes any loss of, or physical damage to, any property of JFPM irrespective of whether it is movable or immovable including economic loss occasioned by such harm.
Competitive Behaviour	In terms of section 4(1)(b)(iii) of the Competition Act (89 of 1998) an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if bidders was involved in collusive bidding (or bid rigging, If bidders, based on reasonable grounds or evidence obtained by JFPM, have engaged such restrictive practices, JFPM may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties. If a

	bidders are found guilty by the Competition Commission JFPM may, in addition and without prejudice to any other remedy provided for in this Agreement or at law, invalidate the bid and/or terminate this Agreement in whole or part, and/or restrict the bidders from conducting business with the public sector for a period not exceeding ten (10) years.

All transactions on the commission floor are conducted through a centralised smart card computer system and no cash changes hands between the agent and the buyer. In contrast with the international situation, this level of transparency is a unique aspect of the trade in South Africa. This aspect allows for the distribution of credible information back to growers and for the detailed monitoring of all activities. The role of the market is seen as to distribute information.

> "The opportunity to compare fresh produce and prices is only available at the Joburg Market because of the number of producers who send fresh produce to the Market. Producers/farmers are able to compare their products to those of other farmers, thereby keeping abreast of the latest trends and developments in the industry. Likewise, buyers are able compare the quality of goods on display at any specific time." (JFPM, 2015)

Table 8.7: Johannesburg market physical facility
Source: Field notes

The Joburg Market is divided into six large sales halls, each with its own speciality produce lines.
• Processing Hub (formally Hall 1 and Hall 2, pp. Food processors, packaging material suppliers, seed and related agricultural products and offices for market agents.
• Vegetable Hub (formally Hall 3/4) : Vegetables
• Fruit Hub (formally Halls 5/6, pp. Fruit
• Potato & Onion Hub (formally Halls 7/8, pp. Potatoes and onions
• Wholesale Hub (formally Hall 9/10, pp. Exporters and vegetable and fruit wholesalers

Image 8.62 shows an aerial view of the Johannesburg facility. This indicates the various halls making up an estimated 80 000 sq. meters of trading space.

Image 8.62: Aerial view of Johannesburg market
Source: Google Maps (2015a)

8.4.2 Pretoria Market

Pretoria is the second largest market in South Africa trading 594 000 tons of produce during 2013 (Pretoria Market 2015, *cf.*). The market is situated to the west of Pretoria close to the central business district. Trade is conducted between buyers and suppliers inside two dedicated halls. Trade is conducted under a commission system where the grower pays 5% of gross turnover and agents charge a negotiable fee averaging 7.5%. The market offers a ripening centre of 6 377 m^2 floor space with 49 rooms and a capacity of 60 380 boxes per week. The cold rooms consist of lower cold rooms with 1 087 m^2 floor space and upper cold rooms with 2 115 m^2 floor space.

The facility provides space for:

- Fresh produce wholesalers;

- Packaging wholesalers;

- Processing businesses;

- Housewives' Market;

- Egg depot;

- Soft drink wholesaler;

- Meat retailer;

- Flower wholesalers;

- Restaurants;

- Bank/Auto Tellers.

Table 8.8: Pretoria Market Vision and Mission
Source: Pretoria Market (2015, own emphasis)

Vision**:**

To be a world leader in the marketing of fresh produce.

Mission**:**

To provide a unique centre where *price forming and fresh produce trading take place* to the mutual benefit of suppliers, buyers and consumers by providing efficient and cost-effective infrastructure and services that comply with international standards.

The Mission statement (Table 8.8) reflects the role of market management to facilitate trade and highlights the importance of price discovery. The statement also reflects the view that the market is an independent regulator that oversees the activities on the market. Technology is a key focus are for markets.

Transparency is seen as a key The Tshwane Market distinguishes itself by the following norms:

- Discipline;

- Transparency;

- Accessibility;

- Ethical standards;

- Co-operation

The Tshwane Market offers buyers the following:

- Modern facilities, which will meet the present and future demands of users;

- The whole spectrum of fresh produce that our country produces;

- Clean market floors for a pleasant and healthy visit;

- Information systems that will meet the demands of all buyers;

- Market information;

- A budget control system that ensures accurate financial management information and general accountability;

- Safe and quick handling of financial transactions;

- Regular product audits;

- Regular monitoring of prices, product age and grading requirements;

- Products are regularly inspected for residue;

- Products that are unsafe for human consumption are removed daily;

- Trolleys for hire;

- Security that safeguards buyers and their assets;

- Impartial market management, which handles disputes between agents and producers;

- A market management that is available 24 hours a day;

- Credit facilities and an user-friendly sales system;

- A convenient sales system.

- A marketing system ensures prices that are to the benefit of both consumers and farmers.

- A system ensures that all fresh produce are fresh and healthy.

- Quality control on the floor on a daily basis, followed by direct communication with producers in the event of deviations and other problems.

- Employment to 162 people, but indirectly to thousands more. No burden to the taxpayer as the

market is self-supporting.

- The market is self-supporting and no burden to taxpayers.

- Buyers are required to be registered and the trading occurs through a cashless environment using buyer tags. Buyers can trade under a credit account or a cash deposit account. The market is heavily involved in social investment activities within the city.

The above illustrates the central role market play in the distribution of information and ensuring transparency. Price discovery features prominently as key function of the market. Image 8.63 shows an aerial view of the Pretoria facility.

Image 8.63: Aerial view of Pretoria market
Source: Google Maps (2015b)

8.4.3 Durban Fresh Produce Market (Ethekwini)

The market is a commission fresh produce market and facilitates trade between the grower and agents. A 5% commission is charged by the market and on average 7.5% is charged by agents.

A Commission Market System is described as follows (Durban Market, 2015):

- The commission system is open to all producers and buyers;

- Market agents who are appointed by the Head: Markets are allocated floor space on the market to sell produce on behalf of producers and/or suppliers;

- Produce consigned to a market agent remains the property of the producer/supplier until it is sold. Once sold, ownership is transferred from producer to buyer;

- Market agents receive a predetermined commission for services rendered;

- Commission is negotiated between the market agent and producer/supplier;

- Durban Fresh Produce Market (DFPM) receives a commission of 5%.

The market offers the following services for the 5% commission charged:

- Trading infrastructure;

- 24-hour private security and CCTV;

- Waste management;

- Maintenance and cleaning service;

- Computer software system;

- Cold storage and ripening facilities;

- Marketing and advertising;

- Sales management;

- Daily market statistics.

Market information is distributed to role players in a transparent fashion:

> "We are committed to providing a secure environment, which is clean, healthy and safe,

thus ensuring that our customers are able to conduct their business most effectively. Durban Fresh Produce Market conducts its business in a manner, which will stand up to scrutiny at all times. To facilitate this process we have created a Fresh Produce Price Reporting System, which allows users to check the selling price of goods sold at the Fresh Produce Market." (Durban Market, 2015:1)

The procedure listed for the establishment of a market agent is as follows:

- Expressions of interest is provided.

- Interview/presentation and selection process is followed.

- The Registrar of APAC issue a valid Fidelity Fund Certificate.

- Opening of a trust account for the deposit of proceeds from the sale of goods. This trust account is audited regularly.

- Market Management allocates trading and office space.

Buyers purchase produce using buyer tags that are linked to their cash account. Money is deposited into the personal account of the particular buyer on the market. A special card is issued that allows for the purchasing of goods across the facility without the need for cash. Table 8.9 provides an overview of the physical characteristics of the Durban market and Image 8.64 and aerial view of the facility.

Table 8.9: Durban market: Physical facility
Source: Field notes

Sales facilities include two sales halls.
Hall 1 for vegetables, tomatoes and fruit is 21 000m^2.
Hall 2 dedicated to potatoes, onions and garlic is 12 000 m^2.
There are six market cold rooms (6 560 m^2/804 pallets), 14 agent cold rooms (1 350 m2/1 350 pallets) and 30 ripening rooms (5 200 m^2/810 pallets,
Additional services provided are:
Seed/Fertiliser distributors (Hygrotech and Canaan Agricultural);
Housewives Market ;
Farmers Retail Market ;
GKN Pallet Depot ;
Restaurant and Take Away Facilities ;
Conference Room facilities ;
Security 24-hours ;

Free Parking ;

Off-loading Facilities ;

Truckers' Rest Room ;

Customer Help desk ;

Price Information ;

First National Bank.

Image 8.64: Aerial view of Durban Market
Source: Google Maps (2015d)

8.4.4 Cape Town Market

The Cape Town Market is listed as one of the oldest fresh produce markets in South Africa (Cape Town Market 2015, *cf.*). The market services 5 500 growers and has over 8 000 registered buyers. The market has cold room facilities for roughly 800 pallets of produce and banana ripening rooms for 55 000 cartons.

The market was acquired in 2004 and shareholding extended to producers and market agents in 2007. The market was the first to introduce formal service levels between agents and market management. The market services hawker trade, wholesalers, retailers and consumers. There is on-site distribution and loading facilities.

Agents on the market are all members of APAC.

"The Cape Town Market's agencies are members of APAC, the Agricultural Produce Agents Council. APAC sets various rules and regulations* pertaining to the storage, handling and sale of fresh produce and the Cape Town Market subscribes to these stipulations as part of our mandate." (Cape Town market, 2015:1)

Payments to agents occur out of a dedicated trust account usually within 24 hours. The CTM is the only market that formalised its relational objectives into a covenant (Table 8.10). This covenant highlights the role from a market management perspective and establishes the role of the market in playing a policing function with the aim of providing a collective trading environment. The market also sees their relationships as a multi-tier relationship, both from a stakeholder perspective and from a service perspective. Stakeholders are firstly the growers, agents and buyers. Services involve the multitude of storage, cashiering, trust payment, facility management and regulatory oversight.

Table 8.10: Cape Town Market Covenant
Source: Cape Town market (2015, own emphasis)

Our Customer	Our customers are the producers of South Africa; the producers of fresh produce, big or small.
Our Duty	Our duty is to provide a *secure, transparent and business friendly environment* within which the producers and buyers feel welcome and confident.
Our Aim	Our aim is to *restore the producers' and buyers' confidence in our market* and to strive to make the market the first place of choice for the sale and purchase of fresh produce. *We aim to restore confidence in the fresh produce markets of South Africa and the Cape Town Market in particular*.
Value Proposition	
The market will remain commission driven.	*This is the only operating model under which a proper and fair price can be established based on supply and demand.* The Market Authority has a 5% dues charge and the Market Agency has a 7.5% commission rate.
We will protect the mechanism by which a pure and honest price is set	The farmer and buyer rely on fresh produce markets to establish a daily price for produce that is a fair and proper reflection of supply and demand. *We will ensure that*

	this pure price mechanism is protected from any improper manipulation or dishonesty.
We will maintain and provide accurate records and statistics	We will employ competent staff and invest sufficiently in information technology to *ensure that all our records and statistics are accurate and readily available to the farmer.*
Zero tolerance towards dishonest or improper conduct	*Any person employed on the Cape Town Market who is found to be guilty of dishonest or improper conduct will be severely penalized and, in serious cases, will be banned from the market.*
Integrity and transparency	*We will create an environment that is founded on integrity and transparency so that our customers are confident* that their fresh produce is secure and monitored, their produce is sold at the best possible price, their *samples correctly reflect quality and* their money is secure and properly accounted for.
Clean and secure trading environment	We will provide an environment that is clean, hygienic and secure. We place the highest possible priority on the personal safety of all those working and doing business in the market. After years of neglect, we are in the process of upgrading the trading hall with the installation of new lighting, new fences, new security cameras and redecoration. We have appointed an estate manager who manages our cleansing and security services.
We support the trend towards traceability of fresh produce	We understand the consumers' need for traceability of fresh produce and commit ourselves to a process whereby fresh produce sold on the Cape Town Market will be traceable.
We will represent and protect the producers' interests	Our staff is trained to be service orientated and to be constantly vigilant to respond to the needs of the farmer and to protect his interests: We undertake frequent stock checks We undertake static stock checks We respond immediately to any discrepancies We act as umpire and honest broker if there is a dispute
We will maintain an independently audited trust account and pay the market agents within 24 hours	The Cape Town Market distinguishes itself from its competitors by maintaining an independently audited trust account and by installing financial management systems, which enable us to pay the market agent promptly, usually within 24 hours of the sale of the produce.
Good working relationships with all role players	A successful fresh produce market will depend on good working relationships between all the role players; owner, farmer, market agent and buyer. Cape Town Market has established professional and cordial relationships between all parties.
Buyer Friendly	The role of the buyer is important in any fresh produce market. We are committed to the provision of a buyer friendly environment, including the provision of credit facilities, where appropriate. We have appointed a manager to represent and promote the interests of the buyers. The Cape Town Market is: Service Orientated Business-like

	Honest

The CTM has launched the first market agent's contract and service level agreement in the history of the fresh produce markets.

"Underpinned by our customer covenant the contract and Service Level Agreement (SLA) serves to provide a secure, transparent and business friendly environment in which *producers and buyers feel welcome and confident*." (Cape Town Market, 2015, *own emphasis*)

The objective of the contract:

- Encapsulates the *roles and responsibilities* of the CTM and Market Agents;

- Unifies the expectations of the various stakeholder groups;

- *Ensures conformity to the provisions of the Agricultural Agents Produce Council*, the Agricultural Produce Agents Act, Act 12 of 1992 and the rules in respect of the Fresh Produce Agents, R1818 of 1983.

The SLA's objectives are to:

- Outline the terms and conditions under which CTM and the market agents *will collectively provide specified services to the producers of the fresh produce industry and the buyers;*

- Provide a basis and framework for the delivery of high quality services;

- Monitor services using the performance measurement criteria and imposing penalties on any shortcomings.

The market plays a collective role to ensure price discovery is pure:

"The Cape Town Market has committed itself to the Producers Charter which mandates that the market be developed, managed and coordinated *to ensure that price formation based on free market principles* be maintained and developed to the benefit of producers and consumers alike." (Cape Town Market, 2015:1)

The Cape Town Market is a commission market regulated by statute. As in the case of other market the

commission is set at 12½% for all produce except potatoes. The market sees the role of APAC as an integrated part of its governance structure. Cape Town Market states clearly that it sees itself as being regulated by statute and by the Agricultural Producer Agents Council (APAC). According to Cape Town Market (1015), APAC protects the interests of the farmer by:

- Registering market agents and salesmen and ensuring that they are fit and proper individuals*;*
- Require market agents to process all financial transactions through a trust account and to submit monthly returns to APAC for inspection*;*
- Require market agents to submit reports to the farmer if fresh produce is not sold within 3 days of receipt*;*
- Require market agents to account to the farmer with the sale proceeds within 5 days of sale of the consignment*;*
- Operating a fidelity fund that will reimburse a farmer for losses as a result of dishonesty by a market agent or salesman.

In addition the market views its role as follows (Cape Town Market, 2015):

- Cape Town Market is a commission market where the price of fresh produce is established through supply and demand and where every transaction is transparent to the farmer;
- Cape Town Market pays its farmers infinitely more quickly than its competitors thus substantially reducing the cost of absent money to the farmer;
- Cape Town Market conducts daily stock and static stock checks in order to ensure that fresh produce is carefully monitored and secure;
- Cape Town Market is a secure and pleasant environment for everyone and probably the only fresh produce facility in the region offering a full basket of fresh produce to buyers;
- Cape Town Market is obsessed with service to the farmer and was the first fresh produce market in the world to introduce Service Level Agreements during 2010;
- Cape Town Market will be introducing Service Level Agreements between the market agent and farmer during 2012;
- Farmers are shareholders in the Cape Town Market and sit on its board of directors.

Image 8.65 provides an aerial view of the Cape Town facility. The above provides an overview of the service the Cape Town market offers as well as the active role the market plays as a regulator of activities.

Image 8.65: Aerial view of Cape Town Market
Source: Google Maps (2015c)

8.5   Regulatory framework Legislation

This section provides a summary of the key elements of the market's regulatory environment in order to illustrate the nature of the governance structure on markets. The regulatory structure comprises a multitude of direct and indirect, statutory and non-statutory legislation.

The following are some of the major regulatory frameworks in place governing South African market operations:

- Department Of Agriculture, Forestry and Fisheries:

  Various Product Groups: Regulations Relating To the Grading, Packing and Marking

- Agricultural Product Standards Act, 1990 (act No, 119 of 1990)

- Agricultural Produce Standards Act, No. 119, of 1990.

- PPECB Export Audits: Perishable Produce Export Control Act, No.9 of 1983.

- Johannesburg Fresh Produce Market: Sampling, Residue Testing and Prokon Inspections.

- City Council: Certificate Of Acceptability for Food Premises In Terms Of Regulation 3(3) Of The Regulations Governing General Hygiene Requirements For Food Premises And The Transport Of Food No R918 Of 30 July 1999 (gn. No 20318) Occupational Health and Safety Act, No. 85 of 1993.

- National Regulator Of Compulsory Specifications (NCRS/SABS)

- Act 12 Of 1992 (APAC)

- Constitution of the Republic of South Africa Act 108 of 1996

- Agricultural Produce Agents Act (Act No. 12 of 1992)

- Marketing of Agriculture Products Act (Act No. 47 of 1996)

- Local Government Municipal Structures Act No 117 of 1998

- Market bylaws issued under Administrative Notice 520 of 1978

Figure 8.66 extends the above and summarises the various legislation. The legislation is also categorised as applicable to products, premises and processes. What this summary shows is that an extensive range of legislation acts to support the assurances surrounding the functioning on markets. The enforcement of these laws provides assurance to the various role players. Product related aspects have been shown in the previous chapter to be an important factor in fresh produce mainly due to its perishable nature. This will be important to incorporate as part of the interaction with actors using SST.

LEGISLATION (STATUTORY)	CONTENT	PRODUCT	PREMISES	PROCESS
1 APS ACT		√		
1.1 PRODUCT STDS	(IMPORT, LOCAL & EXPORT)	√		
1.2 R707	FOOD HYGIENE & SAFETY (EXPORT)		√	√
	COLD STORAGE FACILITIES (EXPORT)		√	√
	ROAD TRANSPORT OPERATORS (EXPORT)		√	√
2 FCD Act		√		
2.1 R908	HACCP (RISK BASED)		√	√
2.2 R692	MICRO	√		
2.3 R246	MRLs	√		
3 CONSUMER PROT. ACT		√	√	√
4 OHSAct	OCC. HEALTH & SAFETY		√	√
5 Health Act				
5.1 R918	FOOD PREMISES	√	√	√
6 TRADE METROLOGY ACT	WEIGHTS & MEASURES	√		
7 PPECB ACT	EXPORTS - COLD CHAIN	√	√	√
8 NAT ENV MGT ACT	POLLUTION (EMISSIONS/WASTE)			√
9 NAT BUILDING REGS	BUILDING STDS		√	
STANDARDS (NON-STATUTORY) GOOD PRACTICE				
1 SABS 049	FOOD HYGIENE MGT			√
2 CODEX	GEN.PRINCIPLES OF FOOD HYG			√
3 SANS 10330	HACCP			√
4 ISO 22000	FOOD SAFETY MGT SYSTEMS			√
5 T-SOP (EXPORT)	TRACEABILITY			√

Figure 8.66: Summary of Legislation relating to markets
Source: Field notes

8.6 Commission agents

The establishment of market agents dates back more than 100 years to 1888 to when the first market agent was registered. Although the system was potentially in place from the 1700s, the earliest registered market agent was W.L. Osche & Co (Johannesburg) registered in 1888.

Farmers were unable to effectively focus on their farming operations and market their products in the towns, which were usually far away. They required a reputable person to represent them at the "market square" who could be *entrusted* with the produce and monies. Initially this would be a family relation (because of the higher levels of trust placed in family members, The commission system was formalised through facilities built with taxpayer's money and managed by municipal employees across South Africa. The various city councils own the facilities and are responsible for the enforcement of rules and the coordination of the various stakeholder relationships. There are currently 23 commission fresh produce markets all operating under the same business rules, the majority of which is running one IT system.

The following quotes form the interviews describes the initial perceptions of agents:

"…the *agent is the most important part of the trust system*, he is the one who has to enter this into the system, he will know what has been delivered and how much is coming from the production areas, also gives information to the buyer." [Interview Ref.: 1:5795]

"The agent is the trust factor in the channel. He is between the buyer and the producer, he can advise to both sides, send yes/no I have a buyer yes/no, the cold rooms are in order the – he is the first contact point and also the last." [Interview Ref.: 1:4868]

Regulation focuses specifically on the agent; Act 12 of 1975 defined an agent as:

"'commission agent' mean any person who, for a commission, sells a product in the Republic on behalf of any other person and who exercise control over either the product or the proceeds of the sale of the product, or over both the product and the proceeds." (South Africa, 1975:1)

Act 12 of 1992 follows the 1975 definition as follows:

"'fresh produce agent' means an agent acting as such with regard to any agricultural product specified in Part A of Schedule 1 on the basis that *the risk of profit or loss at all times remains with the principal.*" (South Africa, 1992:1, *own emphasis*)

The definition indicates the importance that is attached to any aspect that might affect the principal-agent nature of the relationship. According to new proposed by-laws of Johannesburg market:

"commission market agent" means any person who is the holder of a current fidelity fund certificate issued in terms of section 16 of the Act, who is the holder of a current permit issued in terms of section 5 and who has entered into a contract with the Council to occupy an area on the market sales floor for the receipt and sale of produce and includes any person who is a holder of such a permit, employed by a commission market agent and authorised by such agent to act on his or her behalf, to perform any activity of a commission market agent" (COJ By-Laws, 2015)

The above definitions share the following:

- Sell on behalf of other person/s: There is recognition that the relationships are that of a principal with and agent.

- Receive remuneration for this function via a commission.

- Agents need to be a holder of a fidelity fund certificate.

- If performing these functions on the markets then an additional licence from the particular market is required.

- The agent can never take ownership, directly or indirectly as this would create a conflict of interest.

Form the interviews the following comment that illustrates the integrated role markets play:

> "The market and the market agent is an extension of the farmers operations. The farmer is not here, distance and geography starts to play a very relevant role. His whole business model is built on human trust because he trust the individual. The individual sits miles away from the grower. The only way he can hold the individual accountable is through a system that can proof what he does and what the situation is." [Interview Ref.: 1:5745]

Agents in South Africa are represented by a national body: the Institute of Market Agents of South Africa (IMASA). IMASA is an association that is registered under Article 21 of the Companies Act, no 61 of 1973. It is a non-profit organisation and a collective that provides the commission agents on markets a voice on the various national and local platforms. The institute was established in 1945 and acts as a contact to the Department of Agriculture, market authorities and APAC.

The agent's authority is derived from the principal and is granted and defined by a mandate. The provisions of the Act 12, Rules and By-Laws are focused on ensuring that the principal agent relationship is maintained:

- Always act in the best interest of the grower;

- Avoid any direct interest in a transaction;

- Avoid any conflict of interest;

- Full disclosure of all transactions.

(Act 12 of 1992, The Rules notice R1818 (in Government Gazette 15144 of 1 October 1993) and council market by-laws.)

In practical terms, the producer gives the market agent a mandate to sell his produce on the market on his behalf. The agent negotiates a deal on behalf of the producer with the buyer and the producer is bound by this deal. In exchange, the market agent receives a commission. This agreement between the agent and his principal constitutes a valid contract, which is recognised by law, even though it is generally verbal

and seldom if ever reduced in writing.

Another important example is APAC. APAC acts as a supervisory and oversight body for agents. APAC works in partnership with other industry bodies (e.g. the third party inspection providers Prokon) to do random stock audits to assist in ensuring compliance. The results are used to monitor discrepancies and to take legal action. Stocktakes are conducted per product, producer and indicate shortages/surpluses that have to be explained in writing. Trust is formed on the social side, where the reputational aspects of the relationships govern the activities of the participants. The formal and non-social elements do provide assurances, but the relationship between the grower and the salesperson dictates short-term spot decisions.

It is important to note that ownership of the produce always remains vested in the principal, until it is finally transferred to the buyer. This is the essential characteristics of the agency contract and key to understanding the trust relationship that is the focus of regulation (See Chapter 6 on the principal agent relationship).

Each one of the parties incurs certain duties (Weich, 1997):

The supplier:

- The agent must be remunerated;

- The agent is exempted from losses or liabilities resulting from the proper execution of his mandate;

- The agent must be compensated for certain expenses in effecting the instruction;

The agent:

- The agent has the duty to comply with the instruction of the principal, to seek the buyer for the principal's produce;

- The agent must execute his mandate through the agency to which the mandate was granted. Delegation may only occur on the authority of the principal;

- The agent must effect his instructions honestly, faithfully and with care;

- The agent must account to the principal for his actions;

- The agent must separate the money and other property belonging to the principal from his own;

- The agent has the duty, upon the conclusion of his instruction, to transfer all money and other property due to the principal to the latter;

- The agent has the duty to effect his instructions in good faith. The agency contract, established by the mandate given, creates a fiduciary relationship between the principal and agent, which has as its content that the agent should act exclusively in the interest of his principal in affecting his instructions.

The law (and code of conduct) views this fiduciary relationship as being if the utmost importance and it is necessary to examine it more closely. One can state that all other listed duties of an agent, are mere manifestations of this one overriding obligation of good faith. Some of the characteristics of the fiduciary relationship have crystallised out of decided court cases. These decisions now constitute common law.

Transvaal Cold Storage Co. vs Palmer 1904 TS4: also referred to as the Palmer principle:

> "The duty of good faith is described as follows: He (agent) must, while holding his position of trust and confidence, prefer the interest of his principal even to his own in case of conflict and to his skill, diligence and zeal must be added the utmost faith. No agent may place himself in any position where his interest and duty may conflict."

This principle has been upheld (see Hargreaves vs Anderson 1915 AD519 and Osry vs Hirch Loubser & Co. 1922 CPD 531, 549.)

> "Where one man stands to another in a position of confidence involving a duty to protect the interests of that other, he is not allowed to make a secret profit at the other's expense or place himself in a position where his interests conflict with his duty. The principle underlies an extensive field of legal relationship. A guardian to his ward, a solicitor to his client, an agent to his principal affords examples of persons occupying such a position. As was pointed out in *The Aberdeen Railway Company v Blaikie Bros* 1 Macqueen 474), the doctrine is to be found in the civil law (Digest 18.1.34.7) and must of necessity form part of every civilized system of jurisprudence. It prevents an agent from properly entering into any transaction, which would cause his interests and his duty to clash. If employed to buy, he cannot sell his own property; if employed to sell, he cannot buy his own property; nor can he make any profit from his agency save the agreed remuneration; all such profit belongs not to him, but to his principal. There is only one way by which such transactions

can be validated and that is by the free consent of the principal following upon a full disclosure by the agent. Whether a fiduciary relationship is established will depend upon the circumstances of each case. But, as far as I am aware, it is nowhere laid down that in these transactions there can be no fiduciary relationship to let in the remedy without agency. And it seems hardly possible on principle to confine the relationship to agency cases'. The principles so stated remain true, not only for this country, but also in many Commonwealth (and United States) jurisdictions." (The supreme court of appeal of South Africa reportable Case no: 516/02.)

This principle is very clear that an agent may not himself buy the produce a principal has entrusted with in him. This may only be done if the agent fully reveals his interests to the principal and the latter agrees to the transaction (in which case it seems that the agency contract falls away and becomes a mere sales agreement between two parties occurs).

An agent may not derive any hidden or secret profit. Should any unforeseen profit, advantage or remuneration from be generated, it must be revealed and transferred to the principal. Failure to do so would amount to a breach of the fiduciary relationship. The fiduciary relationship between the principal and his agent is regarded by common law as well as the APAC as being very precious, hence the legal protection surrounding it.

The Rules R1818: Part I: Code of Conduct, Section 2.2:

> "A fresh produce agent shall maintain an impartial approach in practicing his occupation and for this purpose be free of any influence or relationship that, either directly or indirectly, could impair his judgement or independence, or could be regarded as being incompatible with integrity and objectivity."

This agency relationship extends to the broader sales people and staff of the agent. The rules governing the agent and principal relationship is very clear, the first sale of a consignment must be a commission sale. At all stages, the supplier is the owner of the product. There can be no dilution of this principle. However, there are subtle ways that this relationship can be compromised, provision of credit being one. The fact that a salesman or agency provides credit to a buyer compromises the objectivity of the salesman. If the buyer owns the salesman money especially when the buyer seems to be struggling to pay back, there is a feeling that he must assist the buyer by either selling lower to him or by giving him preference

over other buyers. Other buyers might have paid more for the product for example. Another example would be the arrangement of a pre-determined price. Once that commitment has been made, the salesman might give preference to that specific supplier's produce in order to achieve that price at the cost of other suppliers. The agent thus becomes part of the risk structure of the supplier. All salesmen faces risks but that is performance risk similar towards all suppliers. Contracting fixed prices is a way for suppliers to exert power over the agent. A fresh produce agent shall represent his principals on an equal basis.

Where fixed prices enter the discussion, the impact on the system is to move towards a buy-sell where risk is not shared but transferred in its entirety. In fixed price transactions, the agent negotiates the price in advance. Should the price on the market exceed this price the supplier benefits from this (and also the agent due to the increase commission %), but should the price be below the agreed amount, the agent could either loose financially by having to pay in the difference, or by losing the supplier to another agent if they do not. The commission income of consignments of 7.5% does not cover such potential losses. This places the agent in a very difficult situation. On the one hand, losing the grower by not conceding to a fixed price and on the other hand not having that ability to buy and then sell the product and achieve a higher mark up. If this arrangement is formalised it has serious implications for the legitimacy of the system. Under these circumstances, the arrangement is not a purely principal agent relationship.

Table 8.11: Example: Effect of a conflict of interest on grower revenue
Source: Field notes

As illustration the following example:
Let's assume that two suppliers send lettuce of similar quality and packaging (Let's say 100 boxes each, Supplier A negotiates a target price of R85/box whereas Supplier B consigns product under normal market conditions.
Due to the perishable nature of lettuce, there is a certain amount of pressure on the agent to move the product. Assuming that the market is over supplied with lettuce, a buyer enters the market looking for lettuce. The salesman having a commitment towards Supplier A would try to sell the product to the buyer as it is still in good condition ignoring Supplier B's product. Buyer buys the product of supplier A at R85/box but Supplier B's product sells at R70/box the next day. Another scenario would be that the agent offers Supplier A's product at R85/box and Supplier B at R80/box.
The average price paid by the buyer is R82.5/box that the buyer pays. The buyer feels comfortable as he has paid slightly less than market price, the agent has achieved the target price of Supplier A. Supplier B seeing that the market is saturated would not know about the sale of the other Supplier A's product and feel that the market price being between R80-R85/box he has done well.

This simple example highlights a very real issue in the daily activities of agents, these actions have the real potential to destroy trust in the not only the agent but also the broader market system.

These aspects affect the provision of systems to agents. One cannot merely offer systems if the intention

of the agent is to keep the transaction hidden. On the one hand, the commission system as it stands forces the transparency of information back to the supplier. This is the role of the market management. The rules (R1818) contain a code of conduct for market agents, which are aimed at ensuring integrity, objectivity and independence of an agent.

The market stakeholders are part of a collective group that needs to perform their various duties effectively in order to create the dynamics of the market. Market agents are regulated by a combination of formal and informal legislation that governs their action.

8.6.1 Service of the agent

Following Lovelock and Wirtz's (2007) "flower of services" model (See Table 8.12) a distinction is made between the core and supplementary services. The core service is the role of price discovery. In addition various operational and logistic support, information distribution, administrative and payment functions forms part of the supplementary services (Table 8.12).

Table 8.12: Agent: Core and Supplementary services

	Service to the grower	Service to the buyer
Core service	Price discovery: determination of the correct price to sell the produce	Price information Procurement: procuring the correct product required.
Supplementary services	Maintaining the relationship with the grower through communication	Price and availability information
	Provision of delivery and storage facility	Financial assistance
	Communication of relevant sales information	24 hour service
	Administrative functions	Delivery service

Agents on these markets are an integrated part of the grower's supply chain (See Figure 8.67). The service product can be viewed through the "smarter commerce" concept of IBM (2014). A broader "farm-to-fork" approach is required to integrate information flows between the various supply chain players.
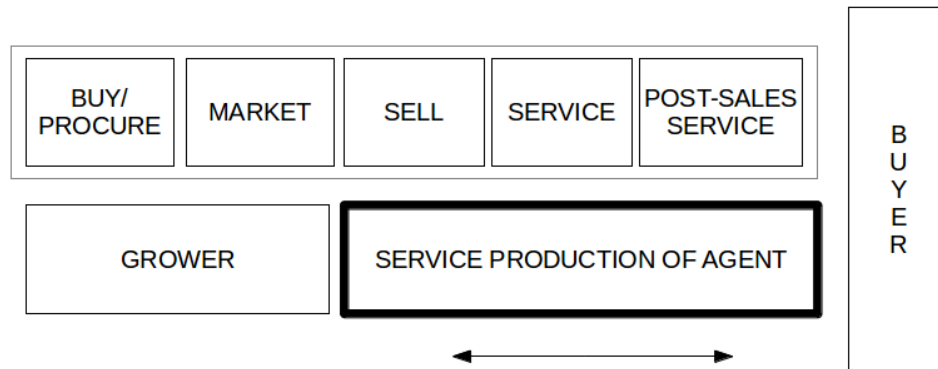
Figure 8.67: Smarter Commerce concept
Source: Adapted from Range and Leonard (2014)

"Smarter commerce" is divided into procurement of goods (growing the produce in the case of growers), marketing, selling and service stages. In this context, the agent's service on markets is an integrated one with the growers' produce-market-sell-service cycle. However, underlying this functional integration lays an electronic integration that needs to be in place to support the activities.

8.7 Market procurement and sales process

This section describes the process surrounding the sale of produce. This is the core process that involves the procurement, sale and payment processes. Agents procure produce from growers across South Africa and internationally. The procurement is driven by expected demand from buyers visiting the market. Salespersons have the knowledge to read the market and determine what volumes would be required. A significant amount of knowledge is involved, which ranges from product knowledge, production volumes, farmer knowledge and the buyer demand.

> "...the subjective perception and judgement of salesmen, based on their experience, play a decisive role in their evaluation of the factors. Certain salesmen also indicated that to a large extend they rely on intuition or "gut feeling". (HSRC, 1991)

Buyers, specifically larger buyers would indicate in which produce pallets they are interested. The buyer engages with the salesperson and a negotiated price is agreed on. Buyers then use their cards/tags to pay for the produce. The amount is deducted from the buyer's account and the product then changes ownership.

The stock sold to them is then removed with the suitable documentation. All transactional activities are recorded onto the system.

All transactions are 100% transparent to the market authority and to the grower who uses the computer system to monitor stock levels. The system also provides aggregated information relating to the daily average price, volumes sold across the facility.

Table 8.13: Commission transaction on markets

Gross sales:
5% Market dues + fixed and non-negotiable + levies + vat
= nett amount payable to agents
Agent commission + other deductions + vat
= nett amount payable to grower

The market authority balances the day and then calculates the gross amounts payable to agents, who in turn will pay the grower. Commission structures are such that the market authority deducts 5% (plus vat) and the agents usually between 5% and 7.5% depending on the product/negotiation.

Payments by the agents are stipulated under various sections of the Act and the rules. The Agricultural Produce Agents Act (Act 12 of 1992) focusses specifically on the trust monies that the agents control. The agents concludes the transaction through an administrative payment system that deposits the final net amount into the growers account and produces a tax invoice showing a full breakdown of the transaction.

8.8 Concluding Summary

In this chapter an overview of the South African market environment is provided. For the provision of self-service, the full spectrum of services and context has to be taken into consideration. An historical overview indicated the long standing entrenched nature of markets within the South African economy. Ironically very little research has been conducted on the way these markets are structured, the importance of trust and the use of technology. Various studies were listed that were conducted to illustrate the lack of focus on these important points. The four major markets in South Africa were discussed and the similarities between them illustrated. It is these similarities that positions these markets as a very important institution in South Africa. Markets act as marketing channels that offer low barriers to entry and low risk.

To achieve this the market structured in a specific way to ensure relationships are built on institutional trust.

The next chapter discusses the use of technology with the fresh produce context.

Part 3: Case Study

CHAPTER 9: MARKET SYSTEMS

<u>CHAPTER ROADMAP</u>

PART 1 - INTRODUCTION

| Chapter 1 | Introduction |
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PART 2 – LITERATURE REVIEW

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CHAPTER 9: MARKET SYSTEMS

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"Digital has changed the immediacy of everything."

Barry Bateman (Oscar Pistorius Trial – Channel 199, 10 April 2014)

9.1 Introduction

This chapter provides background on how market systems look and operate. The intention is to provide a technical backdrop as a foundation for the conceptual framework. Market systems are complex ecosystems that facilitate a multitude of business rules and users. Market management owns and operates the core system and use it as a tool to affect and enforce the governance structures onto the role players (see section 10.9). Institutional trust can only be effective if some form of mutual understanding, shared norms and goodwill exists amongst actors (Riegelsberger *et al.*, 2005). Tight control is kept on all consignments arriving on the markets and the computer system is employed extensively to track activity of the produce. As the various markets in South Africa operate under the same business model, the market systems operate in the same manner following the same core workflows. Chapter 8 illustrates the similarities between the various markets and this is reflected in the underlying computer systems. (Also see Appendix A for a history of market systems in South Africa). It has to be emphasied that all the commission markets in South Africa functions under exactly the same model and thus work in the same manner. The descriptions and reference to the market systems is not the description of a particular market's system.

Within SST environments, the technological system becomes the sole carrier of all trust signals. SST will have to support the core processes, which are described in some detail below. The interpretation of the signals emanating from the environment is facilitated electronically within a SST environment. These aspects refer back to the progressive nature of trust as discussed in Section 5.6. Each one of these listed issues represents a different set of trust dynamics. Contract negotiation and contract execution is an example. The signalling of a credible commitment (Menard, 2004) to transact will involve specific attributes that convey this message. In the same manner, the supporting governance structures need to signal that a credible threat is present if the contract is not honoured. For the institutional trust to have a credible effect sanctions have to be credible (Riegelsberger *et al.,* 2005). Bachmann and Inkpen (2011) further state that the power of the institution and the "depth" of the embeddedness of institutional exchanges create predictability and perceived trustworthiness of the collective "trustee"(institution). This chapter highlights the need for technical integration in order to support information flows across the value chain (Monteiro *et al.* 2012).

9.2 Self-service: it is not just about being online

For a market to function in the virtual space it implies a certain level of electronic integration. As the technology, especially the internet matures the flow of data and integration between different environments becomes more efficient. Underlying the provision of SST is an integrated technical system that needs to support the various requirements. The provision of infrastructure requires joint investments into infrastructure and processes from the various role players to create such an environment. Electronic markets create the perception of low asset specificity (Saengadsapaviriya, 2011) and this will affect institutional trust levels according to Bachmann and Inkpen (2011). Electronic markets need to be seen as high transaction environments (see Figure 9.68). This creates additional emphasis on the ability of SST to support such high transactional environments.
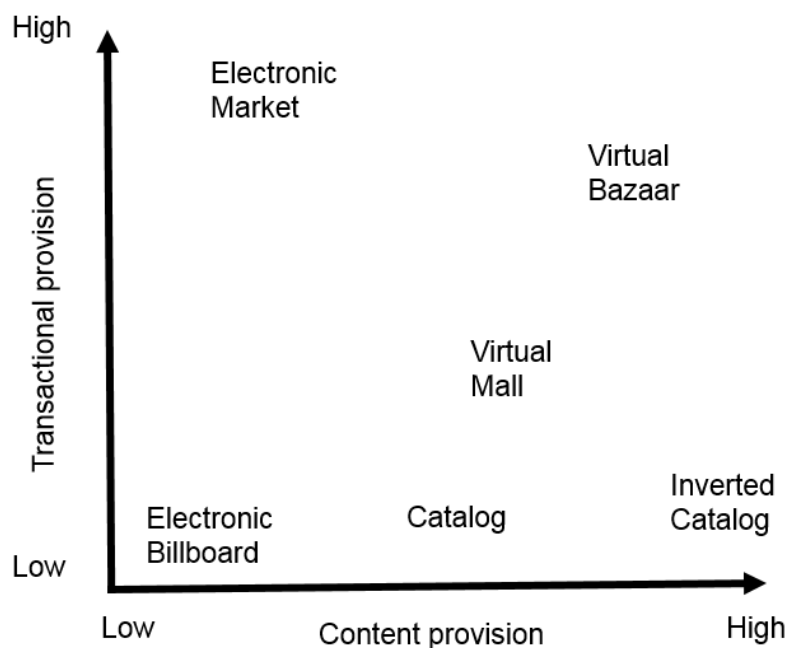
Figure 9.68: Markets as high volume systems
Source: O'Connor & O'Keefe (1997)

Electronic markets are complicated environments accommodating various socio-technical issues (Lawrence & Debenham, 2010) such as:

- Need identification;

- Product brokering;

- Supplier brokering;

- Offer exchange;

- Contract negotiation;

- Contract execution;

- Model on business relationships.

The institutional dimension plays an important role to unlock trust on markets and to support and produce trust through technology. As Beck and Walgenbach (2005) indicate, the organization and the particular relationship with the institutional environment, determines the way in which organisations conform and function.

This is also relevant within the discussion of SST. Within this context, the institutional safeguards rise in prominence as a counter to opportunistic behaviour.

These institutional safeguards, linked to impersonal trust structures underpin the implementation and use of self-service technologies. An example that highlights the challenges of selling produce in an electronic world is the struggle retail had with selling produce online.

9.2.1 Trust and technology

Peter Steiner's cartoon, as published in *The New Yorker*

*Figure 9.69: "On the Internet, nobody knows you're a dog" is an adage,
which began as a cartoon caption by Peter Steiner and published
by The New Yorker on July 5, 1993*

This famous light-hearted cartoon has a very serious underlying message, which more than 20 years later still resonates within cyberspace relationships. At the core of trust related issues in electronic markets lies the role of anonymity and asymmetrical information (Ba, Whinston & Zhang, 2003).

The Economist sums it up as follows:

> "The biggest snag holding back e-commerce for years was a lack of trust. Consumers
> worried (quite rationally) that online firms were fraudsters, or that their credit cards would
> be abused, or that purchases would get swapped for counterfeits during shipment."
> (Economist, 2011:1)

Apart from the anonymity of online transactions, the lack of access to the physical product is another element that introduces risks. Asymmetrical information simply implies that both parties do not have access to the same level of detailed information that might affect the behaviour of the parties. Increasingly more relationships and interactions are mediated by technology, without the expectation to have a physical

contact with the other party ever (Riegelsberger *et al.*, 2005). Services such as e-Bay, Takealot.com, social avatar games, collaboration etc. are engagements without any physical interaction or non-digital communication. It is sometimes found difficult to distinguish between trust in technology and trust in social aspects (Ratnasingam & Pavlou, 2004), yet trust in the technology artefact cannot be ignored (Lanktona, 2014) as it affects the adoption and use of the specific solutions.

> "In repeated exchanges, it becomes important to signal identity, as this allows the trustor to extrapolate from knowledge about the trustor that was accumulated in previous encounters. To act on cues of trust-warranting properties or identity, users need to trust the channel and the channel provider to transmit them reliably and without bias**."** (Riegelsberger *et al.,* 2005:394)

Within the domain of marketing within the retail context, Morgan and Hunt (1994)'s introduction of the commitment-trust theory of relationship marketing posits that commitment and trust is enhanced when there is a focus on the relationship between parties through the *alignment of values, communication of information and avoiding opportunism.*

Online trust according to Mukherjee and Nath (2007:1175) differs to online because:

- Physical distance between buyer and seller, absence of salespeople and separation between buyer and products;

- Absence of simultaneous existence in time and space;

- Absence of human network attributes (i.e. audio, video and sensual); and

- Absence of feedback and learning capability.

Returning to the stages of trust formation, the initial trust forming occurs when trust is formed in the provider of the service (Kim & Prabhakar, 2000). Technology offers unique features to facilitate trust. Technology offers the ability to replace signals or provide information that is not possible under normal circumstances (Reigelsberger *et al.,* 2005). Ratnasingam and Pavlou (2004) list confidentiality, integrity (accuracy, reliability), authentication, non-repudiation, access-control and availability as examples of how technology can enhance the trust experience. Riegelsberger *et al.* (2005) offer a functional view whereby technology can assist trust formation through:

- Transmitting signals prior to trusting action (e.g. on an on-line vendor's site);

- Being the channel for trusting action (e.g. when entering personal information in a web form);

- Being used for fulfilment (e.g. emailing ordered software). We focus our discussion on the signalling function of technology.

Online environments have their own unique characteristics and require the following (Salo & Karjaluoto, 2007):

- The end-user has to be able and willing to take part.

- Information sharing: Users need to accept that their information (transactional and personal) might be exposed to other parties (Pavlou, 2003) and accept the risk of privacy invasions.

- End-users have to accept the impersonal nature of electronic exchanges. In many cases, trust in technology will be linked to trust in the socio-technical systems (Riegelsberger et al., 2005)

Whatever the circumstances, online users need to be protected and security technologies are a way to address contextual aspects of the exchange environment (Meinhart *et al.,* 2006; Ratnasingam & Pavlou, 2004).

Contractual agreements and similar methods could reduce the perceived risk; they do not however remove the need and role for trust. These agreements need to be honoured and as long as the individual perceives this not to be the case, the agreement is rather recourse than a trust reducing method.

Social measures such as trust can play such a softer approach. Contracts provide a formalisation of norms that in turn create sanction. On the markets, there are no formal contracts between the grower and commission agent and strong regulatory environment forces participants to change their behaviour to ensure that the activities on the market are seen as a legitimate operations. Trust between the parties strengthens these norms. Reputational structures form long-term assurances whereas short-term assurances are contained in certifications, warranties, third party endorsements, ratings, testimonials and information disclosures.

9.2.2 Selling freshness

The experience selling perishable products online has not been positive. Online activity is driven by convenience, on-demand and personalised services (Bortz, 2013) but as with AmazonFresh, consumers

do not equate "online" with physical product dimensions such as "fresh" necessarily (Hartman Group, 2013).

Technology is influencing the way consumers are engaging with the supermarkets. Online companies, such as Amazon China, create joint initiatives to service the customer through self-service type solutions focussing on convenience. Integrating the off-line and on-line worlds however proved a challenge for Chinese retailers. The experience has been that from an operating model and a supply chain perspective the physical and online stores are very different (China, 2013).

The combination of life-style changes and technology changes has positively influenced online retail, but fresh produce has been struggling. Perishable products pose additional challenges and place pressure on the logistical functions to reduce the handling, storing and sales cycles. The interaction between the customer and the physical environment is not just a matter of convenience (Hartman Group, 2013). Perishable products require high care environments (Mainville & Peterson, 2005).

> "While e-commerce activity for some consumer packaged goods (CPG) products -- especially perishable categories where freshness counts -- may not be as transformative as other non-CPG industries -- such as books, music and travel -- online grocery purchasing power is growing." (Nielsen, 2012)

> "Analysts say Amazon has yet to crack the code on how to deliver mass-market groceries at prices that enable it to both compete for customers and turn a profit. What's more, they say, Amazon must convince customers to put aside their misgivings about buying perishable food sight unseen." (Amazon, 2015:1)

Regardless of the type of product or service, the approach to providing online environments needs to take the differences of dealing with an online environment into consideration.

Self-service technologies will have an ever-increasing effect on the nature of physical supply chains. As the requirements and development increase functionality in the front-end changes, it will force backward pressure on the structure of the supply chain. The emergence of e-commerce solutions such as Amazon.com has transformed the logistical chain by creating the need for location warehousing and delivery services. Even with digital ordering/purchasing functionality through interactive windows, interactive storefronts and interactive show rooms, the physical ability to deliver the product determines the success of the solution. In many ways the idea that cost can be shifted to the consumer is not true, the

reverse actually is true. The reduced consumer-transaction costs are only possible by investing heavily on backend processes and technologies.

In a highly physical product environment such as fresh produce, this aspect is vital to understand. Rather than approaching provision from the top down (interface to backend), planning has to be from the bottom up (back-end to the interface). The digitisation of the front-end requires the digitisation of processes and backend infrastructure as well. This aspect is illustrated by the following example of GoCargo.com.

9.2.3 GoCargo.com

Highly physical environments cannot be compared to highly service related industries such as banking, especially when the location of delivery of the product is geographically dispersed. Economist (2000) issued the following warning to spot market initiatives:

> "Too many B2B exchanges focused on the spot markets in their industries (or imagined that such markets existed) and are now paying the price. By focusing on the exception rather than the rule, they were bound to remain fringe players, starved of liquidity and ignored by most of the big firms in their industry, which continued negotiating contracts with each other as before." (Economist, 2000:1)

The article goes on to describe a particular initiative called gocargo.com. Although this article is from the 2000 era, it is astonishing how the same circumstances and the supply chain dynamics ultimately still affect initiatives today.

Go-Cargo was hailed as an exchange for container shipping. From the outside, the process looked simple:

- The containers are standard size equipment;

- The costs transparent;

- A highly competitive industry with many buyers and sellers of container space.

All that was required it seemed was some form on online environment to automate and facilitate the bidding, administration, logistical and coordinating activities

As with the fresh produce industry, however the realities of the specific supply chain determined the direction of the solution, not the solution itself. The at-sea component is only one portion of the traveling and cost structures of a container transaction's life cycle. Customs, multiple modes of transfer and multiple

service providers on the journey, all contributed to the fact that containers are handled the same old way, "… through relationships, brokers, sales calls ..." (Economist, 2000:1)

The "hidden" costs of people performing multiple functions and their various personal relationships along the way contributed to the complexity of providing this service in an online environment. The marginal cost saving of a digitised booking system was significantly outweighed by the real value of physical services performed by people.

Similarly, the provision of exchange services in fresh produce seems to be simple viewed from the outside. However, the provision of an end-to-end service is not possible when only focussing on the electronic portion of the transaction. Pricing affected the carriers in the case of Go-Cargo as the carriers did not want to reduce their prices and treated their service as an undifferentiated commodity. As in fresh produce, the sales service and the ability of the agency to differentiate their service from its competitors, is part of their value proposition to growers. Making the core service generic removes the role of certain functions and the ability to form brands within the exchange.

In Go-Cargo's case, the business had to adapt by employing additional people specifically to maintain relationships, manage contracts and sales, screen shippers and carriers and otherwise "... make this handshake business safe for Internet trading." (Economist, 2000:1). Go-Cargo had to introduce alternatives deliberately specifically for the carriers to differentiate themselves and retain competitiveness (the article does not mention what these were).

Therefore, the transactional element does not determine the effectiveness of exchanges alone, but also the human/relational component, logistical backbone and supporting infrastructure. The introduction of more players into the channel, which is required for an exchange, complicates the channel and minimises the success of the exchange when it is constructed in this manner. During such an exchange, the spot markets tend to be less suited for electronic exchanges than longer-term speculative contract based markets.

The internet is a major driver in empowering the customer to adopt a more central role in the provision of services (Campbell *et al.*, 2011). As pointed out by various authors, however the internet is not completely reliable for delivering self-services and the expectations from the firm and the customers are not always met (Moon & Frei, 2000; Salomann *et al.*, 2006). The firm's expectations related to costs are the most important. Implementing and maintaining SSTs are in most cases more expensive with no clear return on investment. In addition, Leonard and Strydom (2011) point out that the SST environment tends to run

parallel to current support infrastructures and does not replace it completely, which in effect duplicates costs.

The lesson for fresh produce and the implementation of SST is that what seems to be a solution might just lead to the destruction of value. The market processes as it stands are generic and introducing SST into the industry might be met with resistance if the systems do not add additional value.

9.3 Basic Market work flows of produce

From the outside, fresh produce markets appear deceptively simple. The process of delivery, quality assurance, storage selling and release is facilitated in an environment where there are multiple businesses operating on the same system using the same workflow. The system is a cashless environment where all activity is logged to ensure full traceability (See Table 9.1 for a short history of the current system.)

Table 9.1: Adoption of commission system

Source: General discussion with C8

The similarity and origin of the current system had its origins in the 1940/50's. The auction system in operation posed challenges to the market authorities, buyers and agents. These were mostly related to the time it took to conduct sales. The commission system (or out-of-hand system) was introduced over a 20 year period. Most people did not trust this alternative way of conducting sales. But as the markets adopted the new way of selling the benefits became clear and the process was adopted across all markets. As part of providing the assurance to the various stakeholders, stringent measures had to be built into the process to provide assurance to the growers. From this perspective one can argue that the system was designed to address a specific problem.

The market system comprises a core system that captures all transactions with the various trading entities and their users interacting with the system at various levels. Figure 9.70 illustrates the main processes supporting the flow of product from grower to buyer via the market. All these functions are performed on the central computer system of the market.

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GROWER MARKET AGENT BUYER

Registration of stakeholders

Entrance gate

Receipt of deliveries Stock movement

Stock control

Opening of deliveries Cold storage & ripening

Downgrading

Destruction

Return to farmer Sale of produce

Sorting

Stock taking

Cashiering Quality control checks

MAIN PROCESSES SERVICED BY THE SYSTEM

Figure 9.70: Main system processes across the value chain
Source: Field notes

Produce arrives at market facility

Physical receipt on market floor by agency staff

Off loading and placement of stock in storage areas

Line items on delivery is captured into the sales system (Unique numbers allocated for selling purposes)

Sales transaction is captured on system and relevant sales removal documentation is generated.

Unique delivery note reference number is allocated on the system

Figure 9.71: Basic transactional workflow on markets
Source: Field notes

Product arrives on the market and is captured by the market's consignment control personnel (*Figure 9.71*). The consignee is the agent and the product is received and captured in detail onto the market system. When sales occur, the buyer receives the produce and removes it from the physical floor. Buyers are forced to use the market's payment system. Monies are paid into the smart card system and all transactions occur against these buyer accounts without any cash being used on the market sales floor. After a day-end process the relevant monies are paid over to the agent's trust account from which the grower is ultimately paid (*Figure 9.72*).
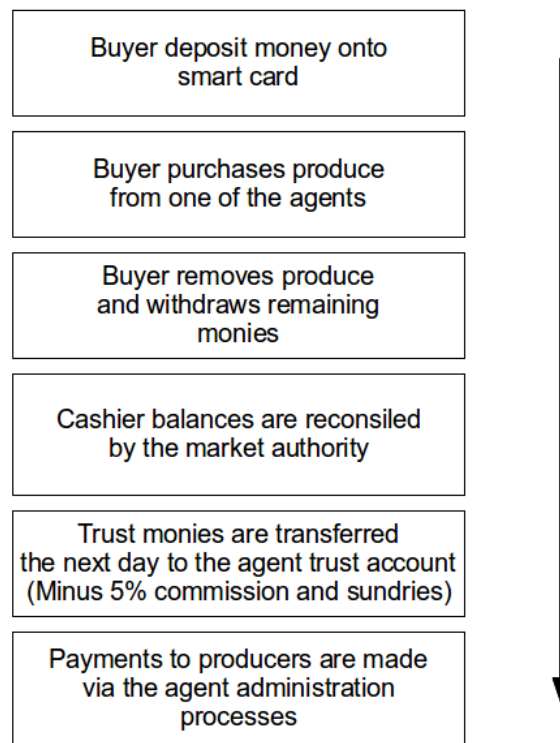
Figure 9.72: Flow of funds
Source: Field notes

The above illustrates the basic workflow components of the market system. The process typically comprises delivery, receipting, quality inspection, storage, selling and stock release (Figure 9.73). Market consignment control processes monitor the receipting of products by the agent. After the product is registered onto the market system, the agent is responsible for the confirmation of delivery by capturing the relevant detail information into the system. At this stage, the stock becomes available for sale. Products are placed into storage facilities as and when required. In the case of bananas, the product is first sent to

ripening rooms where they are ripened and then sent to the floor. Products are also constantly moved in and out of the cold storage facilities. Buyers that want to purchase products will interact with the salesperson or will inspect products standing on the sales floor to determine quality. A multitude of processes occurs around the product that is presented for sale that affects the trading environment.
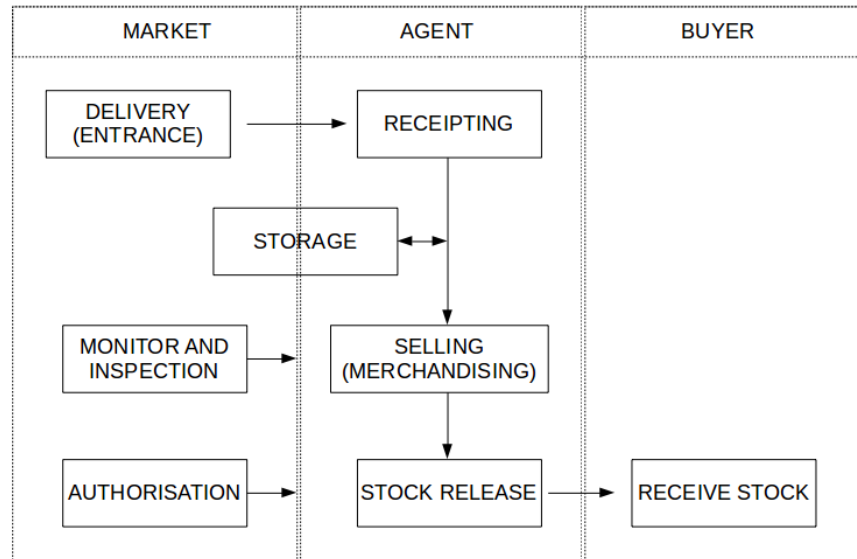
Figure 9.73: Physical transaction flow
Source: Field notes

The collective product availability, quality of the product and the activities of other buyers and salespersons all influence the decision making of the participants. Delivery involves an allocation to and coordination of the trucks. Receipting involves the generation of the receipt transaction and a quality and temperature check. Quality assurance monitors the suitability of the stock and could downgrade, or even return stock if the stock is not within specifications. Physical storage involves the placement and quality monitoring, which is required to keep products within acceptable standards. During the selling process the physical price and delivery aspects of the process is negotiated and accepted. Finally, the stock release involves the handover to the buyer. Ownership changes to the buyer the moment the transaction is sold on the system. Prior to that, the ownership is that of the grower and the salesperson is responsible for this.

In parallel, a series of functions occur that does not form part of the system's transactional flow. The only evidence of the activities and intentions of the users is that which is captured on the system during this process. The actions only become visible to the system through the decision to commit and transact on the

system. A multitude of peripheral activities that are person to person in nature, create the activities of participants. Examples of these are indicated in Figure 9.74.

DELIVERY	RECEIPTING	QUALITY ASSURANCE	STORAGE	SELLING	STOCK RELEASE
CONFIRM DELIVERY	GRN RECEIPTING	SUCCESSFUL	ALLOCATION OF STORAGE	SAMPLING	STOCK WITHDRAW
ASSIGN BAY TO TRUCK	QUALITY CHECK	RETURN TO FARMER	CONSIGNMENT PLACEMENT	NEGOTIATION	STOCK RELEASE
	TEMPERATURE CHECK	DESTRUCTION	SAMPLING	RESERVATION	HANDOVER
		DOWNGRADE	COOLING / RIPENING	CONFIRMATION	INSPECTION
		BARCODING	RE-PACKING	DELIVERY ALLOCATION	

Figure 9.74: Extension of transaction flow
Source: Field notes

Figure 9.75 and Figure 9.74 illustrate the peripheral activities surrounding the transactional floor. Through these activities, trust is potentially created. The trust in the transactional portion of the process relies on the ability of the system to reflect accurately the interactions of the participants in the transaction. This would include the presence of the monitoring- and third party authentication services of the market authority. Through their activities, they form part of the structural assurance provided to the buyer and salesperson; that the environment they are trading in contains barriers to opportunistic behaviour and offers resources for contractual enforcement. If a buyer does not receive the correct products that he purchased, he can approach the market who will act on his behalf. In the same manner, the grower can approach the market authority to question transactions on their consignments. Salespersons and agents can also use the market authority to raise questions regarding other agents, buyers and growers' activity if they deem it improper. Market authorities pro-actively manage the activities of all these parties to prevent deviations or transgressions of the by-law and/or procedures.
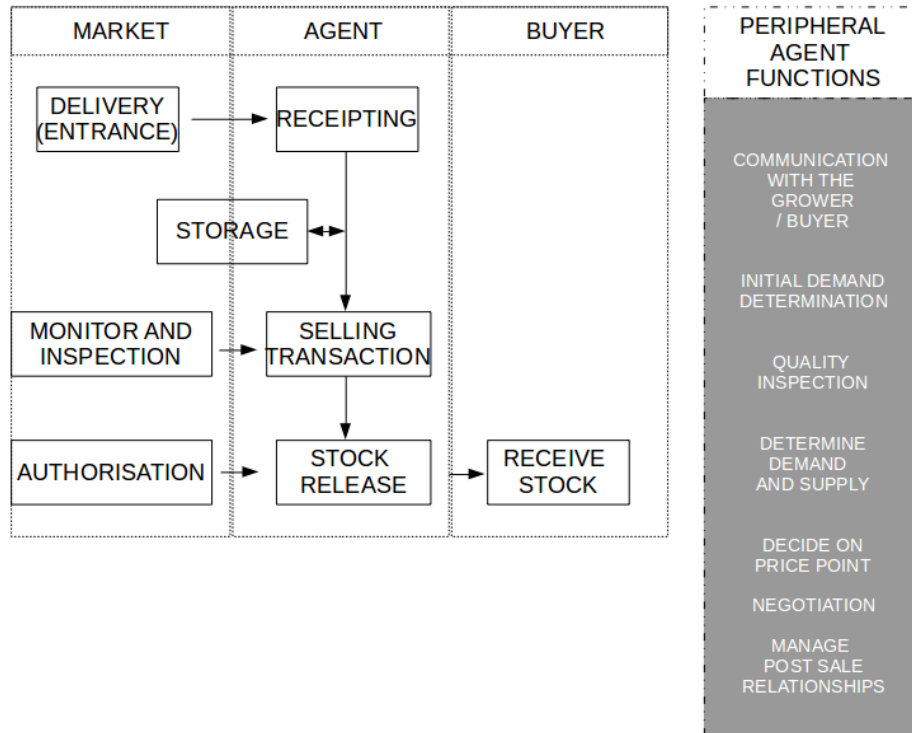
Figure 9.75: Peripheral activities
Source: Field notes

The various activities of the salespersons reflect their ability to deliver on commitments made both to the grower and to the buyer. For the grower and buyer a distinct pre-delivery phase exists where parties are occupied with searching for a particular service provider. The agent on the other hand is also involved in searching for products to meet the estimated demand. A constant flow of information occurs throughout the process to both the grower and the buyer in which various aspects of the product and market environment is transferred. The buyer, grower and salesperson have the opportunity to verify the various bits of information at a low cost because of the concentration of buyer and agents in one location. Information (prices and volumes) relating to trade is also published and made available to the various participants. The system offers accurate stock figures that allow the agent to monitor and move stock as required.

Negotiations between buyer and salesperson occur in an information rich environment where discussions around price are informed by the various information sources. Although the opportunity exists for participants to exploit the information, they will not necessarily always use the information. A buyer might simply trust the agent due to historic interactions. Growers might trust the activities of the salespersons

and will react to advice that they provide. This could typically be information on what product to send, how much of it and what the expected prices are. This process is done on an individual basis and the trust relationship occurs within the protection of the broader market structure.

9.4 System logic

The system's design mirrors the internal value chain of the market's core processes. The underlying supporting services of the system are focussed on serving the role players and their requirements. This environment is regulated by the various mandates that are allocated to the stakeholders. Producers, the market authority, agents and buyers form part of the value chain that requires the system to monitor and tract the various physical product flows and user activities. The value chain is supported by system services that facilitate the processes. It is apparent from this that the system has to facilitate more than merely the movement and sale of product. A combination of social and formal rules coordinates activities on markets (Figure 9.76).
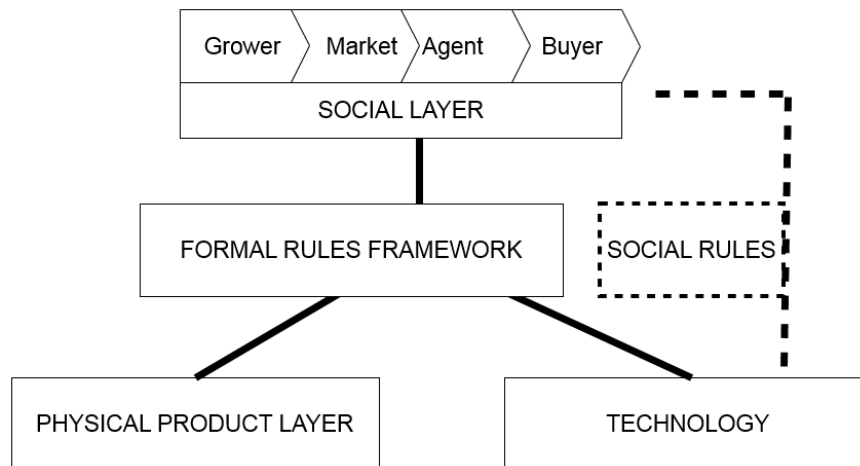
Figure 9.76: Market layers, formal and social rules
Source: Field notes

The technology layer shapes the social activities through a rules framework, whereas the rules framework dictates action and coordinates actors within the market. In the same manner, the product layer provides the motivation for participants to try to sell and acquire the product. The product's attributes influences the rule set but the social layer enforces requirements (food safety and traceability) that influence the manner in which the product is delivered and handled. Similarly, the requirements are built into the

technology layer to facilitate requirements. Traceability is a good example. For the product to be traceable, the delivery and receipting process has to ensure the physical product is encoded correctly. The technology layer needs to receive these encoding values and allow for the interaction between the social layer and the system to gather information and monitor the activity.

To place the above in context, consider Hingley, Sodano and Lindgreen's (2008) lists of potential differentiators. Typically, the following are demand drivers from consumers that are listed (Hingley *et al.,* 2008):

- New varieties;

- Packaging;

- Standards and grading;

- Certification (organic, fair trade etc.);

- Shelf life**;**

- Tech foods (GM. Neutraceutical) – IV GAMMA (fresh cut, prepared, dressed, ready to eat);

- De-seasonality;

- Traceability and origin**;**

- Food safety**;**

- Ethnic specifically.

Differentiation on the retail side is pushed by the consumers and the need to innovate and differentiate becomes essential. These dynamics are fed back through the supply chain to the grower. This involves more than demand side marketing. Self-service solutions have to identify the aspects that build trust (underlined in the above example), which are structural components of user perceptions that have to be quantified. These facets have to be included and signalled deliberately to build trust.

The design of an electronic exchange model should not focus on the transactional but on the information flows across the various processes and between the various user groups. Figure 9.77 provides an overview of the various core processes the system facilitates. This image illustrates the multi-layered nature of the technology interface. Each one of the logical units accesses the same eco-system governed by the central set of rules. The system itself becomes a central point of enforcement for these rules.

Although different services are consumed the integrity of the eco-system affects the collective view of the various actors. Multiple users consume the services as indicated within very distinct boundaries. The various actors would experience the actions as captured in the technology layer. Employing self-service in this context has to facilitate the services as illustrated but also has to make provision for the interaction between actors on a social level. It is within this social layer that trust perceptions transcends trust in the technology artefact itself and should include the various social signals that is collectively generated by fellow actors.
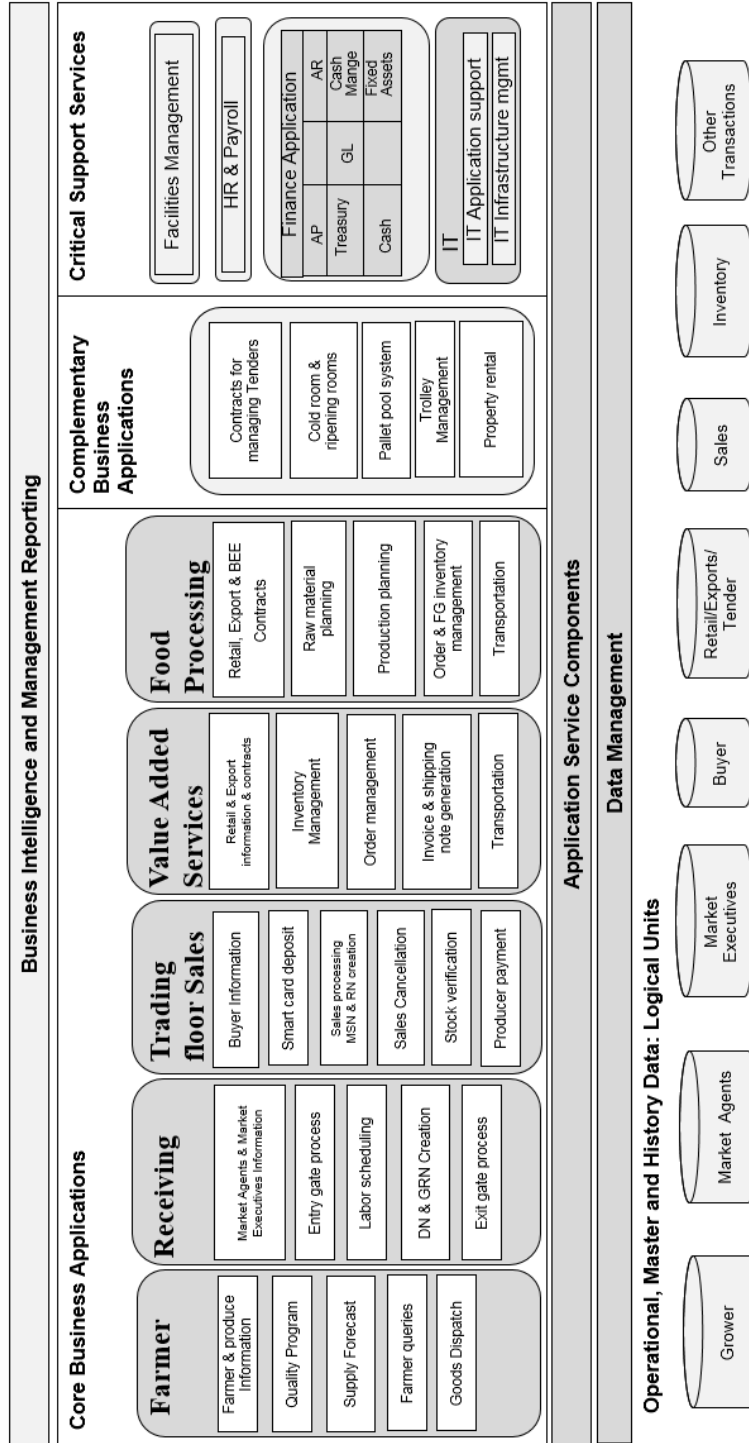
Figure 9.77: Overview of core applications
Source: Internal presentation

9.5 Concluding summary

This chapter introduces the basic market processes as well as layout of the actual market system structure. These processes are designed to strengthen the various business rules and broader institutional mandate of the market authority. Because the complete environment is under the direct control of the market authority the enforcement of governance via the technology layer is extremely effective.

Some examples of the reality of selling perishable products are also highlighted in this chapter. In order to effectively sell freshness, additional assurance measures are required across the supply chain through third party providers. Providing self-service is not a simple matter of finding technology solutions but requires a broader institutional approach. The next chapter discusses the findings from the various interviews.

Part 3: Case Environment

CHAPTER 10: DISCUSSION OF CASE FINDINGS

CHAPTER ROADMAP

PART 1 - INTRODUCTION

Chapter 1	Introduction
Chapter 2	Research Methodology

PART 2 – LITERATURE REVIEW

Chapter 3	Approach to the Literature Review
Chapter 4	Structuration Approach
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PART 3 – CASE ENVIRONMENT

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CHAPTER 10: DISCUSSION OF CASE FINDINGS

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"The world changes and technology comes and goes but human problems remain the same."

Enid Mumford (2003) as cited in Porra and Hirchheim (2007, p.1)

10.1 Introduction

This chapter provides an overview of the case findings and a summary of the interview data and represents the first part of the development of the conceptual framework. The intention is to uncover those aspects that inform a conceptual framework for trust structures within self-service solutions. Fieldwork consisted of a variety of interviews with key institutional role players on markets and similar industries. The institutional trust environment was investigated to understand the dynamics behind trust forming in potential electronic market places for fresh produce. Structure of the industry, business processes, various laws and regulations and the nature of the product emerged as major sub-themes within the current market environment. Markets are collective eco-systems that rely on more than just transactional activity for its operational dynamics. This broader perspective is required when developing a foundation for the development of theory surrounding electronic service delivery.

The following section discusses major themes that emerged from the various interviews.

10.2 Background and overview to the interview process

Selection of interviewees is partly opportunistic and subjective, but is one of the most important data gathering tools in qualitative research (Meyers & Newman, 2007; Yin, 1994). The selection of interview-participants was informed by the research question and more specifically by the relevance of the specific role and seniority of the interviewee within the industry. This is an important approach to avoid bias:

> "A key approach is using numerous and highly knowledgeable informants who view the focal phenomena from diverse perspectives. These informants can include organizational actors from different hierarchical levels, functional areas, groups and geographies, as well as actors from other relevant organizations and outside observers such as market analysts. It is unlikely that these varied informants will engage in convergent retrospective sense making and/or impression management." (Eisenhardt & Graebner, 2007)

Interviewees include the views from different participants active in senior roles within the food market environment. Interviews were conducted with specialists occupying senior executive positions responsible for performing various functions within the fresh produce. The average years of experience of interviewees is 16 years (Min: 3 years/Max: 30 years). The interviewees represented a diverse and

extensive knowledge base of market related aspects. Of particular value is the fact that the majority of the interviewees have experienced a pre-/post-technology environment on markets. Their input reflects the practical realities of the implementation of technology on markets. Table 10.1 and Figure 10.78 provide a summary of the interviews.

The various roles of the respective organisations are IT service providers, traders, electronic trading system suppliers, market management and the industry's regulatory body (APAC). IT service providers include key role players in the South African fresh produce industry, providing services to local market systems (on market) and export systems (off market). The major fresh produce technology companies have been active in the South African industry since the 1980s and evolved organically within the industry. There were numerous initiatives over the years to introduce self-service type solutions and these companies have been central to those conversations

Table 10.1: Interview summary (C = Company)

REF CODE	CATEGORY	TITLE
C1	IT system provider	Managing director (28 years)
C2	IT system provider	General manager (13 years)
C3	Trading company	Managing director (7 years)
C4	Market management	Director Revenue and Financial management, responsible for the market trading system, market safety systems and financial management system (19 years)
C5	Market management	Senior Executive: Commercial and operational (18 years)
C6	Market management	Client services manager (19 years)
C7	Trading company	Managing director (25 years)
C8	Market management	Managing director (12 years)
C9	Electronic platform	Operational manager (7 years)
C10	Digital services	Digital media design (3 years)
C11	IT service provider(AGRIC)	Managing director (25 years)
C12	IT service provider(AGRIC)	Marketing/Client services (12 years)
C13	Regulator	Registrar appointed under Act 12 of 1992 (6 years)
C14	Trading company	Managing director (25 years)
C15	Trading company	Traders (15 years)
C16	IT solution provider	Senior business analyst – self-service technologies (30 years)
C17	Electronic platform	Technology strategist (10 years)
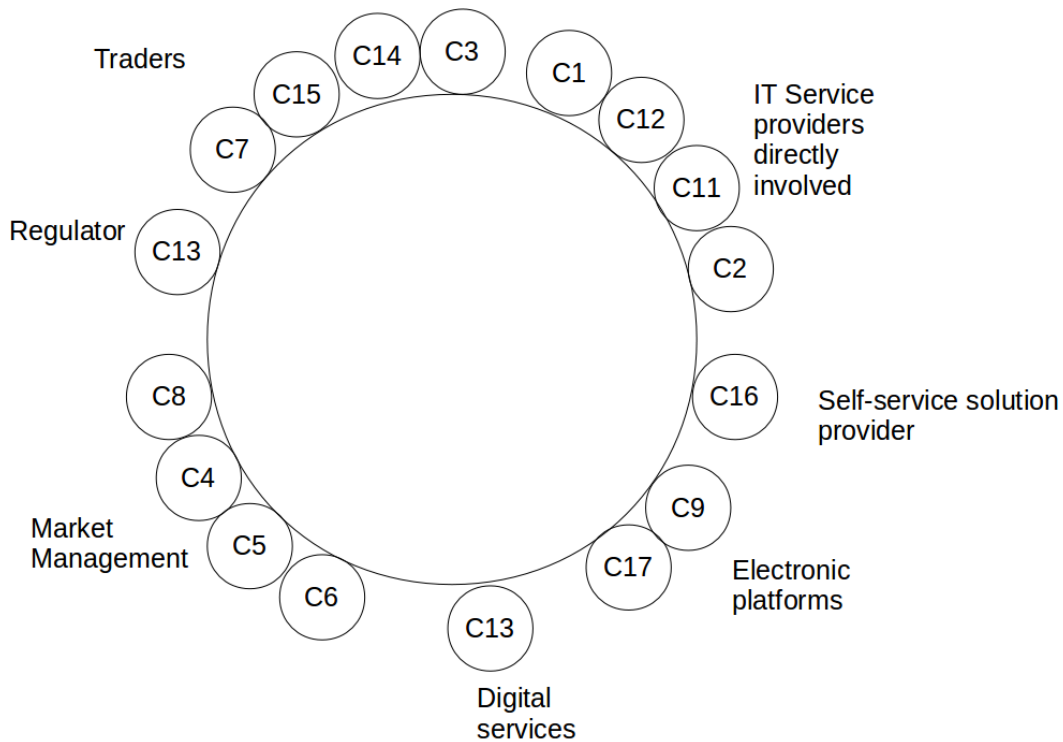
Figure 10.78: Overview of interviewees' roles (C=Company)

For the purposes of the discussion, the various themes emerging from the research is grouped and discussed under specific headings.

10.3 Data collection and processing

The processing of interview data was conducted using the ATLAS.ti (http://atlasti.com/) tool. After transcribing the interviews, the primary interview data was imported. The procedure that is followed is not a sequential one, but rather a constant return to previous steps to adjust and update previous decisions. This reduces in intensity as the issues crystallise. The following steps were followed:

10.3.1 Reading transcripts and coding

Initial impressions are noted alongside the themes emerging from the field notes and documents. Attention is paid to repetitive themes and explicit statements. High-level conceptual ideas, which initially emerged were noted. This step is a repetitive one characterised by a continuous re-reading of the transcripts until

an initial point of saturation is achieved. The coding tool is used to auto code the transcripts based on the initial code list. Through the coding process, specific sections of the text are labelled. Codes are grouped into categories/themes. This process is the crux of the analysis (Taylor-Powell & Renner, 2003). The word cloud and word cruncher functions are used to identify high frequency words and these were further used to identify initial themes. Once the initial coding is complete, coding was extended to broader passages. Table 10.2 provides a list of coding labels used in the analysis of the data.

Table 10.2: List of coding labels

TRUST		
trust progressive	trust planning	third party trust
trust building	trust definition	dishonest
signalling	distrust	disputes
opportunism	information	trust atmosphere
reputation	privacy	risk
subjective	benevolence	perception
INSTITUTIONAL ENVIRONMENT		
market	third party	monitor
mandate	vulnerability	effectiveness of markets
supplier	market management	relationships personal
buyer	logistics	relevant
agent	accreditation	supplier size
service	traceability	channels
price	relationship power	tool
rules	produce retailer power	facilitation
power	power of APAC	definition
history	collective	rating
supply	service definition	protocol
problem	retail power	guarantee
rules and system	Reliable	grading
control	Network	definition of service
ownership	supplier power	ability
demand	Adoption	inspection
communication	Institution	design
triangulate	Auction	knowledge

online	supply chain	physical facility
integrity	Expectations	exchange
regulate	relationship frequency	PPECB
physical presence	Collusion	automate
competition	agent power	producer power
stakeholder	agent producer power	governance informal
standards	agent retailer power	information
relationship with retailer	Access	sharing
consistency	Relationship	pro-active
SERVICE	ASSURANCE	PRODUCT RELATED
system	Assurance	requirements
self-service	Governance	quality
self-service physical vs virtual	governance site specific	product power
self-service characteristics	broader industry matters	product interaction
integration	third party	physical product
service measurement	consumer protection act	perishable
service provider	by-laws	
service to producer	Certification	
service to grower	APAC	

10.3.2 Relevance and connections

ATLAS.ti offers a code co-occurrence tool (Figure 10.79), which provides an initial starting point that is helpful to explore higher-level linkages. The strength and value of these connections require subjective interpretation. Discovering any hierarchies, or allocating specific importance to codes/groups, involves a view of the broader interview context. In many instances, a broader reading of the section of the interview is required to provide context to a particular statement. These visual connections are made within ATLAS.ti using the network manager (Figure 10.80) where different concepts are presented graphically. It is very much in the post analysis that the issues crystallise as the various data sources and text are brought together.

The various linkages between the major codes are illustrated in Figure 10.79. High frequency of labels such as product and market can be expected given the context of the produce market. However, important linkages between market / governance / information are made that indicate potential focus areas. These

results are of course merely tools to assist in contextualising the data. Figure 10.80 provides the visual overview of the major themes with trust forming the central node. These linkages are elaborated in more detail later on in the Chapter.

CODES

	agent	buyer	distrust	governance	information	market	market mana	power	product	self-service	service	supplier	system	trust
agent		20	2	8	9	38	14	11	16	4	8	39	22	21
buyer	20		4	8	9	38	9	16	30	3	10	37	17	18
distrust	2	4		3	3	2	2	n/a	4	1	2	5	3	9
governance	8	8	3		2	18	5	2	9	4	2	10	8	4
information	9	9	3	2		22	4	4	15	4	10	23	29	23
market	38	38	2	18	22		38	18	49	7	13	60	39	20
market management	14	9	2	5	4	38		5	7	2	2	12	17	5
power	11	16	n/a	2	4	18	5		16	n/a	5	17	12	4
product	16	30	4	9	15	49	7	16		7	18	43	17	10
self-service	4	3	1	4	4	7	2	n/a	7		12	7	2	11
service	8	10	2	2	10	13	2	5	18	12		12	5	14
supplier	39	37	5	10	23	60	12	17	43	7	12		21	37
system	22	17	3	8	29	39	17	12	17	2	5	21		27
trust	21	18	9	4	23	20	5	4	10	11	14	37	27	

Figure 10.79: Co-occurrence table –example of major codes

Figure 10.80: Major code relationships as generated in ATLAS.ti

The digram indicates the underlying codes that represents the clues to answering the research questions.

Governance for instance can be seen linked to assurance and third parties. The "market institution" is shown to have a link with trust. Trust is also linked to information, the system and aspects like transparency, history third parties and governance. Some of these linkages, like governance and trusts have been identified in the literature. This map reflects the components the main research question refers to and forms the basis for the following discussion.

10.4 Discussion of empirical findings

This section reviews the interview data. The market is a collective, an institution that relies on the actions of multiple stakeholders' for its functioning. These exchanges are not simply an open access, free for all or self-regulating institution. It is structured in a very specific way where roles are allocated and specific boundaries are set. However, this collective needs strong regulation with the regulator/s having the ability to enforce regulations. The levels of assurance provided within service settings are central to the provision and functioning of trust (Spohrer, 2008; Lee & Turban, 2001). The role of market management is to ensure that the role-players act within the boundaries set by their mandate and relevant rules to provide various assurances to all participants within the market environment. These and other dynamics of the case environment is discussed below and acts as a description of the functioning of markets.

Trust on markets are placed in both the inter-personal relationships as well as in the institutional structures itself. The following illustrates this within the context of the market discussion:

> "… if I look at the various producer agent relationships established over years, years and years on the farm; the grandfather, the father, the son that starts now trust the same agency and the same happens in the agency, it is the grandfather then the now the son. It is understandable it years of trust relationships where they understand each other. But a producer that looks a bit broader, that to a new agency, what makes him trust the agency? *The total dynamics inside the market, all the elements of the market, the role that the market plays, the role that APAC plays, the agency self, the ownership".* [Interview Ref.: 1:5934]

According to Bijman (2006), governance structures can be classified as a set of public and private rules that ultimately govern transactions, protecting its integrity (Williamson, 1979). A strong regulatory environment provides pro-active assurance that any opportunistic behaviour will be addressed with potential recourse provided. Trust and governance complement each other in this manner (Alt & Klein, 2011).

Discussions are grouped around themes that emerged from the case material (See also tables under the conluding summary of chapters 4, 5 and 6). Within each of these sections the various quotes that relate to

the particular discussion is presented. The grouping of these themes is not exclusive and some overlapping occurs between the various sections. A summary is provided at the end of this section to highlight key points raised. Throughout the discussion the word *market* will refer to the fresh produce market context of the case environment. There are references to agent and salesmen and these should be seen as the same although there are different ways in which their functions can be described. For the purpose of this discussion these are treated as the same.

10.4.1 Agent/Grower relationship: Trust as a resource

Traditional views of trust between the grower and the agent is characterised by a personal relationship between individuals (a physical handshake). Individual perceptions play an underlying role within trust relationships, even in institutional contexts (Zucker, 1986).

> "The potential for damage to the industry is enormous – particularly when so much takes place on the *strength of a handshake*. Mutual trust is vital." (Cordes, 1996:1)

> "… traditionally trust was between an agency and grower *through a handshake* …" [Interview Ref.: 1:4743]

> "Markets are built on trust, that is why in many cases you find that a grower will stay with an agent or salesmen, he knows him and he has built up a relationship with him." [Interview Ref.: 1:4783]

> *"I think the initial contact always has to be on a human basis,* after that the trust can be built by self-service, or have a trust record of you have done before and you can deal with that. The initial introduction will still be on a human basis. If then later on and we are already in a working process, or an establishment where we already deal with each other then, yes I think the trust can be enhanced by self-service. Obviously giving the grower as much information as possible, will give him the trust. There is always a relationship, for the quality and the quantity and what you have at that moment is doing the right thing for him and he has to perceive it, which is a very difficult thing and I think it is a very difficult thing to build in." [Interview Ref.: 1:5954]

This person-to-person dyadic view of trust is certainly the traditional approach within the industry, but what is not recognised as part of this view is the role the broader institution plays in establishing trust relationships (Riegelsberger *et al.*, 2005). The strong person-to-person trust position linked to control over the product provides a resource that the agent draws on to exert power over the other participants in the market. The following quote illustrates this point:

> "... the grower trusts me, we have a very strong relationship, if I tell him to send product even if I tell him don't send product, he trusts that I understand the market. I advise him. The other salesmen can phone him and the buyers also, let them try, he knows that I move the volumes, I perform …" [Interview Ref.: 1:6010]

Performance trust can be seen here as a resource (authoritative) in this instance that agents draw on as part of their mandated role within markets to sell and achieve the highest prices. Within the trading environment, this allocates significant power to the agent who uses this as part of the negotiation dynamics of supply and demand and as part of the interaction with the market management. Personal level trust is linked in this manner to the collective functioning of the market and the perceptions other role-players have of it.

But as Giddens (1990) indicates the trust in *expert systems* such as the market environment is placed in the *correctness of the principles* within the institutional context and not just in the faith in the good intentions of the individuals as such. Although one can certainly argue that expertise (ability) and integrity of the individual maintain and build trust relationships, predictability as an institutional construct plays a central role in trust formation (Corritore *et al.*, 2003). Predictability is classified under expectations/beliefs category and forms part of the calculativeness that characterises trust formation (McKnight and Chervany, 1996). It is the perceived effectiveness of governance structures and the predictable nature that it provides that affects perceptions of risk that has to be managed from an institutional perspective (Giddens, 1990). Institutional trust forms a secondary layer that actors draw on mainly under conditions of recourse (Luhmann, 1979). Specifically the degree to which perceptions emerge that the "...institutional mechanisms provide recourse, are enforceable, are convenient, are available and are cost effective, among other factors" (Pavlou & Gefen, 2004:38). Trust is more than just the system; it is viewed as the broader service eco-system of both technology and people. Institutional views are extensions of this personal view. What can be deducted from this is that actors form trust perceptions on the micro level and that broader institutional trust is a result of a collective view. In addition, the governance structures form a complimentary layer to trust perceptions. Underlying trust structures emerge because not only of the interaction with the environment but also because the collective understanding of what the status quo is, what the agreed norms are.

> "Contracts between private agents act as a substitute for missing or imperfect public enforcement institutions. In this way, private institutions help to expand market opportunities and increase market efficiency." (van Berkum & Bijman, 2006:117)

Referring back to the section on stratification (Chapter 5), trust perceptions are formed at the individual level as part of the reflexive process of calculating contextual risk. Calculus-based trust, knowledge-based trust and identification-based trust are positioned as part of an actor's decision-making process (Lewicki & Bunker, 1995). The combination of personal and institutional level trust underpins the selling mandate that forms the entry point and catalyst for the flow of trade (and the principal-agent nature of the relationship). In the case of all role-players, the perceptions relating to the effectiveness and transparency of institutional structures within markets form an important resource that is drawn from as part of creating trust perceptions in dealing with the institution.

Interviewees tend to refer to trust within markets in a holistic manner inclusive of the broader institutional functioning of the market. Trust and governance are linked as part of the actor's broader schema and, in this case, as part of well-established governance structures. This schema occupies similar dimensions between the various actors when the institutional trust is institutionalised, as is the case on the market.

Trust has a structuring effect on institutions as it affects the perceptions relating to domination (levels of benevolence) and the creditability of these structures, linked to the ability of the custodians of governance structures to enforce the rules. However, as was shown in Chapter 8, this eco-system was not the result of chance but of a systematic plan to establish these facilities over many years. Specifically, aspects such as ownership of the system, design of governance structures, role allocations and control over the participants characterise the trading environment of markets.

> "If one wants to maintain the current system then *ownership is important*, if one wants to redefine the system and change then ownership becomes less important. When we talk about a system where supply and demand is inherent to the system, where the product is under the control of the third party and where the third party can abuse power that he has, by mere virtue of the fact that is in his possession. *I do not see a viable commercial alternative to that type of system.* If you say let's change the system to a wholesale system, *I would say that it does not belong within the local government sphere. I include the computer system, the form of ownership is inter-related. You would not be able to function if you did not have control of the system, you cannot fill you mandate*. I would have a serious issue if we were going commercial and the decision was let's get rid of low-income lines that supply the market let's focus on the high yielding product that comes through this market. Or it was said to improve your return on investment let's make it a potatoes only market, or onion only market, when you are going commercial you are no longer looking at the social side of the market, to be honest there is a serious social investment into markets that you cannot deny. My point is markets are and going into the future, if we want to ensure a balanced marketing system and accessibility. How do you keep the balance of power between agents, producers and buyers? Once you go the commercial route one of those three parties are going to *dominate the system*, if you want to keep the

system as it is you need an *independent third party, independent form the producer, independent from the buyers, independent form the agents.* The greater the independence the better wholesaler, retail *you do not need independent management, the shift in power is really* important. It is a collective, if you are not part of the collective you are part of the breaking process. We need that message to go through, that in our current environment it is a collective, once we do that enhance trust within the system opportunism." [Interview Ref.: 1:4562]

This collective view is also reflected within the following quote:

"If the market is *in control* of the market it increase the trust in the market and *the agent is part of that,* if the market is seen to be managed well, there is progress, funds are allocate, they will give preference to that channel. A good and well-run market attracts creates suction power of good organised buyers. Payments will be handled without issues. *The agent is there on a mandate from his grower, to act on behalf of the grower*, the insight he has in big into the decision making of the grower, how many bags to send etc. As well as the negotiating skills to sell to the buyer." [Interview Ref.: 1:5793]

Trust definitions ranged from individual personal definitions to more institutional views. The predictable nature of the expected outcome emerges as a common theme:

"If you are trusted, if you have a track record that causes your client to depend on you, that you will deliver what you say you will deliver, *that you do what you say you will do,* within the agreed time or agreement is that it is what build trust over time and puts you in a position where the client is comfortable to give you more business." [Interview Ref.: 1:4973]

"… *you have to deliver on what is promised and* the more often you deliver on that, the higher the trust will be." [Interview Ref.: 1:5653]

"… it is a difficult word*; it depends on the person's perception,* it will differ from person to person. With one person, trust can be *tight* and with another it can be *loose*; for me whenever you use the word trust, then the word fiduciary duty comes up, trust is that, that utmost trust, what I say to you, what I ask from you, *you will come back and you will deliver*. There is no dilution in your process, trust is a serious word if I can call it that, trust asks a lot, trust is your honour, your actions comes back to those words of you." [Interview Ref.: 1:5076]

"… in our industry, that the person with who you negotiate, does exactly *what he promises to do and does it consistently and continuous*. That trust, especially as far as growers are concerned, are of critical importance." [Interview Ref.: 1:5834]

"… I think it can be on *a couple of levels;* one is on *a interpersonal relationship* level where people implicitly trust each other through physical actions or mannerisms or attitude and then obviously from a brand point of view people trust established brands, people that has been around for a long time that are reputable and well known." [Interview Ref.: 1:5847]

"… the buyer can trust you, whatever you tell him and whatever you say, he *can trust you so explicitly that he does not even want to look at the product."* [Interview Ref.: 1:4386]

> "… we have done a market survey and one of the issues that came up strong is trust, *specifically trust in the people they already have a trust relationship with"*. [Interview Ref.: 1:5065]

The approaches to trust support the ability of the agent to deliver on a continuous and predictable manner with ability as a key element in perceptions of trustworthiness (Corritore *et al.*, 2003; Mayer *et al.,* 1995). The individual, regardless of their positions or functions share this predictability/ability view. The market is a commercial institution and trust relationships diminish rapidly if performance-based trust is broken, especially in a highly competitive environment such as the market. One should distinguish between the breaking of trust due to commercial reasons (not achieving expected sales results) and that of institutional failure, the inability to enforce rules.

The risk is ultimately associated with the product and specifically the sales and payment of the monies. Historical performance is taken into account when decisions are made, but with a very low tolerance for mistakes. Long-term relationships on the market between trading partners on the grower/agent side are characterised by mature relations, but even these relations are threatened very quickly if performance falters.

The transaction process is deliberately made transparent on markets. This is done through the integrated use of the computing infrastructure. Familiarity and clarity of both your own processes and of the other trading partners provide a high level of situational normality and structural assurances reducing the perceived risk of participation. People's actions and reactions are made *more predictable and* perceived as less risky. Two challenges facing exchanges according to Bijman (2006) are coordination of activities and safeguarding of transactions. An independent third party controlling the central computer system creates a sense of objectivity and confidentiality. Technology plays a key role in coordinating activities on markets. All transactions need to be channelled through the system. The market's system is tightly controlled and high levels of security prevent transactions from unauthorised access. Through the technology platform, the authority is able to enforce business rules, governance and assurance functions. As Das and Teng (1998) illustrate, trust in the actual monitoring system supports trust-forming behaviour.

Figure 10.81 illustrates the primary trust structures (solid arrows) and the secondary trust structures (dotted arrows). A perceived detachment exists between social actors and the institutional trust structures (Bachmann & Inkpen, 2011). Secondary structures are drawn upon when primary trust is broken as an ex post recourse. Secondary trust structures also play a more dominant role during the establishment of trust relationships when primary roles are not yet formalised as part of the progressive process (Range &

Leonard, 2014). Secondary trust structures also include aspects such as role allocation and boundary setting, all part of the framework that both sets down the rules and forms the broad set of formal and informal norms collectively agreed amongst stakeholders.

> "In the case of mature industries, community norms, structures and procedures are the primary institutional mechanisms to establish trust-based relationships. To a lesser extent, reputation and legal regulation also play a role." (Bachmann & Inkpen, 2011:32)

This is evident from the various discussions and refers back to the personal nature of a certain part of the trust landscape on markets.
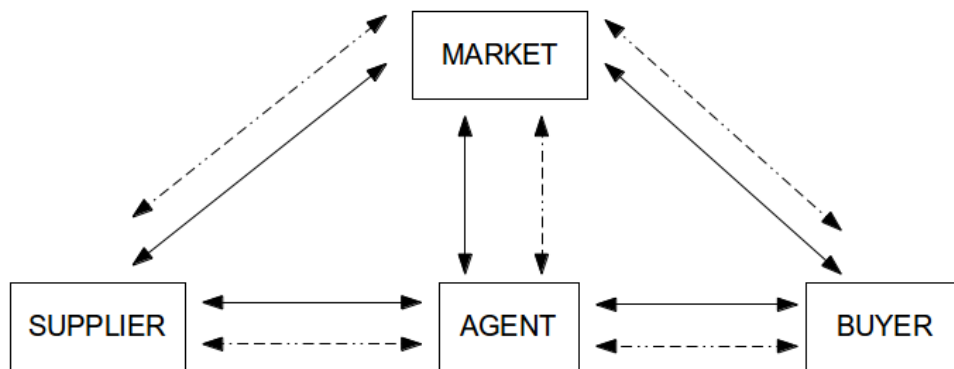
Figure 10.81: Primary and secondary trust layers on markets

Fresh produce markets in South Africa are characterised by very stringent formal governance structures (dotted lines). In addition, informal norms (solid lines) play an equally important role in regulating behaviour on markets. Examples of formal rules informing the markets are:

- Constitution of the Republic of South Africa Act 108 of 1996
- Agricultural Produce Agents Act (Act No. 12 of 1992)
- Marketing of Agriculture Products Act (Act No. 47 of 1996)
- Local Government Municipal Structures Act (Act No. 117 of 1998
- Market bylaws issued under Administrative Notice 520 of 1978

Informal rules are for example:

- Quality control
- Best practices/requirements
- Service level agreements

- Personal relationships

Not only does the market have power, but the agents also have power through their relationships with buyers and growers. The following points from NAMC (2009:23) illustrates the delicate balance between the important role of the agent and the potential risk of the consolidation of power in the hands of agents:

- Producers are of the opinion that market agents are playing a more prominent role in the marketing process than before, but they have not taken up more risk.

- Producers expressed concern about potential market power by market agents based on the volumes certain agents handle. This becomes even more problematic where market agents directly or indirectly have linkages further down the chain. Prices for potatoes on the floor could potentially be influence where such linkages or contracts exist in favour of the market agent.

- Increased transparency is needed in so far as inventory holding and downstream transactions are concerned.

Formal rules applied consistently across the facility mitigates this perceived risk and *creates credibility as each participant's power is characterised by distinct boundaries.* The emergent structure of dominance is the prerogative of both a single dominant force and various collective channels of power, which create stability and ultimately a trusting environment.

Institutional trust stems from:

> "… collectively accepted norms and not from socially disembedded individuals' rational (or indeed irrational) decisions. With respect to inter-organizational relationships, business environments are thus viewed as constitutive conditions of firms' behaviour." (Bachmann & Inkpen, 2011:13)

Thus, the role allocation and boundary setting on markets is essential towards trust creation. The challenge facing electronic exchanges is how to capture the various dynamics of a seemingly free acting collective but provide very distinct transactional boundaries through legislation as described in this quote:

> "… it is important to understand, *it is not a freebee, we cannot decide what we want to do*, the ACT determines what we can look at, the ACT determines the process from where the agent receives the product, where he sells it and where he pays the grower." [Interview Ref.: 1:4372]

The type of service itself creates boundaries that affect the nature of the interaction between stakeholders. The shifting of service boundaries through technology can be in both directions, either towards the customer or towards the service provider (Campbell, Maglio & Davis, 2011). However, as a highly

institutional environment, the boundaries are embedded in the system and fixed. Focus on the "value-creating knowledge and capabilities" (Campbell *et al.,* 2011) of both the supplier and customer are required to co-create the service eco-system. The better the solution accommodates and exploits "value-creating knowledge and capabilities", the more this solution can affect the perceived value.

The agent initially draws on the trust relationship that exists between the grower and the agent during the negotiating phase. The agent has knowledge about the trading conditions, which gives a certain level of power within the negotiating process ("ticket to the game").

> "… role of information is critical. It *includes market information, product knowledge, seed, fertilizer and knowledge.* It is a *ticket to the game*, you have to know exactly what happens on the local market, that information we share daily. The report is used to discuss with the grower what has to be done; you have to be up to date with the latest information. It has to *be timeous, relevant and accurate information*, the grower will start to trust you based on this". [Interview Ref.: 1:5828]

This quote illustrates the multi-layered nature of the information that characterises the knowledge of the agent. The source of this information is not just transaction related but includes information from external sources. This is also termed contextual knowledge and is expensive to transfer between parties due to its implicit nature (Baily & Bakos, 1997). The information generated on the market (of which the market systems' information is part) is part of a greater pool of information generated. This aspect is important when one refers to information and its usage on the markets. Information is not just qualitative information. Still part of the previous quote the user continuous:

> "… there are 20 role-players that compete with you. Everybody gets the same information but you have to differentiate yourself. You have to be at least as best as the closest competitor with you. Growers will use *past performance* and the level of reporting and administrative functions as part of the decision making process". [Interview Ref.: 1:5828]

The two previous quotes refer to the concepts of ability, benevolence and integrity as part of the trust process and indicate that without it the grower will lose trust in the agent. The fresh produce market is a fast-moving environment where product is sold quickly. Routine plays an important role in the relationship between the grower and the agent due to the high frequency of stock replenishment. The combination of the trust forming elements of ability, benevolence and integrity and the continuous interaction (on a routine basis) shapes the relationship between the grower and the agent. Agents talk to their grower daily. Relational trust is seen as the strongest form of trust but it is very costly to build (Koehn, 2003). But the market environment also allows for low cost switching between competing agents. Because of the short term nature of the agreements the

perception of the grower is that this allocates him power over the agent because of the constant threat that the agent might lose the grower.

> "Frequent transactions paired with renewable contracts provide the possibility of withdrawing from future business if fair play in sharing gains generated by mutual efforts, is not respected." (Menard, 2004:365)

Figure 10.82 illustrates the nature of the daily communication between the grower and agent. This institutionalises the communication process due to the generic nature of the interaction amongst agents. Growers experience the same process regardless of what they send. Apart from the commercial reasons linked to the nature of fresh produce, the interaction is also governed by a regulatory requirement that dictates the sharing of information. The paper trail from these communications usually forms an evidentiary chain that is used by APAC as part of disciplinary proceedings. The nature of the communication is dictated through the APAC rules:

> Section 25. Reports on unsold fresh produce
> 25.1 If a consignment of fresh produce is not fully sold within three business days after the receipt thereof, the fresh produce agent concerned shall forthwith inform his principal of the extent and condition of the unsold quantity.
> 25.2 Similar reports shall thereafter be provided to a principal on a weekly basis until the full consignment has been sold or otherwise disposed of.
> [APAC, 2005]
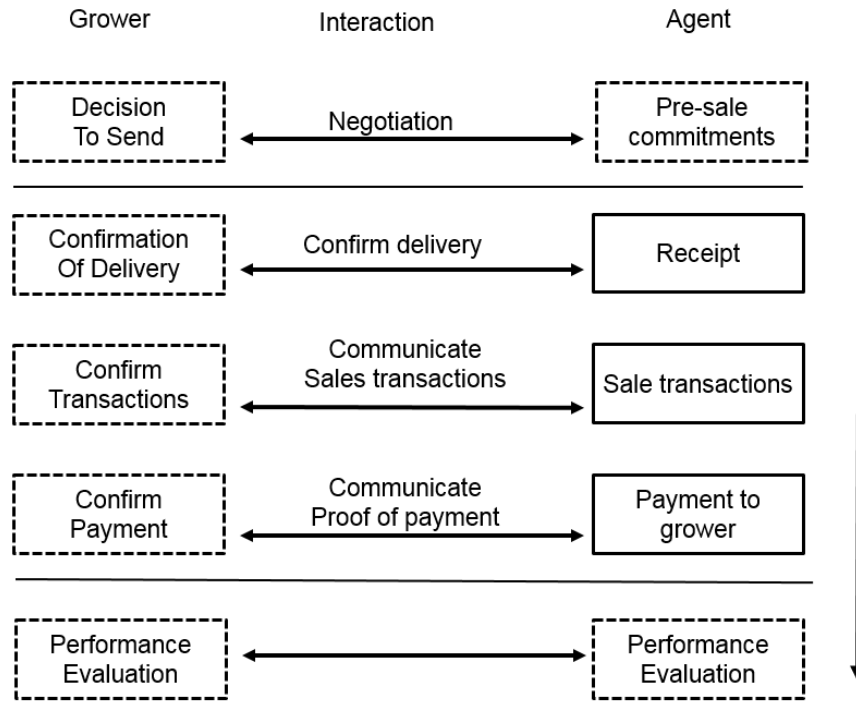
Figure 10.82: Grower and agent interaction

Within the first interaction, growers have a distinct power over the agent as the product is still in the grower's possession. Once the product flows to the agent and a receipt confirmation is issued, the power moves to the agent who can act within a set of norms to sell the produce through the implied mandate from the grower. At this stage all the activities of the agent are captured within the market system. The agent uses (is forced to use) the facility to communicate with the grower as part of the governance framework balancing the power asymmetry. A very important document forms part of this communication, simply called a *producer fax report* (Example in Figure 10.83). This simple document confirms the sales for the day and any quantities outstanding.

The agent is authorised by the grower to make decisions regarding the sale of the produce within the parameters of the negotiation and/or the nature of the agreement with the grower. Post sales evaluation is where the grower would compare the performance against the expected performance as communicated during the negotiation stage and/or based on the continuous perceptions created by the agent. Throughout the process the grower is using his/her own internal processes to record and monitor the activity of the sales agent. The post-trust stage, the stage after a transaction is completed, is where the evaluation of expected results and actual results are compared and this in turn informs subsequent trust actions (Range

& Leonard, 2014). This whole process is facilitated by the market's computer system. The computer system is drawn on not to communicate only the sales transaction (automatic generation and sending of the fax) but also to confirm the adherence of the agent to the norms as set by the trading environment's rules (sending a formal market document shows authenticity). The agent is forced to use the system as the fax document forms a legal document proving compliance to the rules. The agent enacts a technology-of-practice of *forced compliance* whereas the growers use their own systems to *monitor/evaluate* adherence to expectations. At this stage, the grower does not have to call on the governance enforcement via the market authority, as there has not been a suspicion of any wrongdoing. But in the event that a suspicion arises, the grower will approach the authorities who will investigate a complaint. A typical situation as described by the comment of the Registrar of Act 12:

> "… because I can still discover that agent still right the faxes by hand, the transparency can be 104%, we say it is transparent you *can go and look on the system*, but we can see it the growers cannot see it, as markets we are light years behind the gap is great, because the grower cannot see what is going on, I think the trust can be enhanced. The main *complaint is weak prices*, the agent promised me x amount and now I get my money and it does not balance, what is going on?" [Interview Ref.: 1:4805]

The interaction with the system enacts certain technologies-of-practice that has as its source compliance related motivations. These are driven by governance structures but facilitated by the interaction of various autonomous users within the same system. On markets, fresh produce agents offer different types of services to the buyer and to the supplier side. A sales service to the grower (as a representative of the grower in the transaction) and a sales service to the buyer as part of selling the physical product (Range & Leonard, 2014). The agent sells two categories of services (Range & Leonard, 2014):

- Selling a service to the grower: selling and handling the product on the grower's behalf.

- Selling a sales service: selling the actual physical product on behalf of the grower to the buyer.

The information the agent provides is broader than the pure sales information.

Table 10.3 illustrates the relationship between the service offerings and the use of the system. In each of the service offerings, the agent (in this case) draws on the system as a resource to fulfil its actions.

Table 10.3: Core and supplementary service
Source: Adapted from Range and Leonard (2014)

	Service to the grower	Facilities drawn on

Core service	Price discovery: determination of the correct price to sell the produce	System as a source of transparency
Supplementary services	Maintaining the relationship with the grower through communication	System as a credible communicating tool
Supplementary services	Provision of delivery and storage facility	System as a physical logistical unit
Supplementary services	Communication of relevant sales information	System as a credible communicating tool
Supplementary services	Administrative functions	System as an administrative support tool
	Service to the buyer	Facilities drawn on
Core service	Price information Procurement: procuring the correct product required.	System as a source of transparency
Supplementary services	Price and availability information	System as a source of transparency
Supplementary services	Financial assistance	Outside of system
Supplementary services	24 hour service off-loading	Outside of system
Supplementary services	Delivery service to buyers	Outside of system

This enacts specific technologies-in-practise structures that is summarised in Table 10.4. Table 10.5 list the various structures that characterise the social interaction between the parties.

```
********************************************************************
FARMER NO. :          [REDACTED]        FROM   : [REDACTED]
                                                 CAPE TOWN MARKET
[REDACTED]                              RUN ON : 18 Jun 2015 09:38
                                        CONTACT : [REDACTED]

EMAIL ADD. :          [REDACTED]
********************************************************************

FARMER : [REDACTED]              - SALES DETAILS    2015/06/18 09:38:02 PAGE 1

CONSIGNO : [REDACTED]    02 Jun 2015 WAYBILL : [REDACTED]   REFNO: [REDACTED]
          Cucumbers English 1X LI 6KG
   DATE        SALES          PRICE        VALUE  QTYDEL  QTYSLD  QTYDIS  QTYPRV  QTYONH
   02 Jun 15     66           52.50      3465.00
   02 Jun 15      4           60.00       240.00
                 -----       --------    --------
                  70           52.93     3705.00    70      70       0       0       0
REMARK :
RESERVED STOCK :  NO RESERVED STOCK
PROVISIONAL SALES NO PROVISIONAL SALES

CONSIGNO : [REDACTED]    02 Jun 2015 WAYBILL : [REDACTED]   REFNO:  SALESMAN: [REDACTED]
          Cucumbers English 1L LI 6KG
   DATE        SALES          PRICE        VALUE  QTYDEL  QTYSLD  QTYDIS  QTYPRV  QTYONH
   02 Jun 15     95           37.50      3562.50
                 -----       --------    --------
                  95           37.50     3562.50    95      95       0       0       0
REMARK :
RESERVED STOCK :  NO RESERVED STOCK
PROVISIONAL SALES NO PROVISIONAL SALES

CONSIGNO : [REDACTED]    02 Jun 2015 WAYBILL : [REDACTED]   REFNO:  SALESMAN: [REDACTED]
          Cucumbers English 2M LI 6KG
   DATE        SALES          PRICE        VALUE  QTYDEL  QTYSLD  QTYDIS  QTYPRV  QTYONH
   02 Jun 15      2           30.00        60.00
   02 Jun 15      3           50.00       150.00
   03 Jun 15      1           30.00        30.00
   04 Jun 15      2           30.00        60.00
                 -----       --------    --------
                   8           37.50       300.00    8       8       0       0       0
REMARK :
RESERVED STOCK :  NO RESERVED STOCK
PROVISIONAL SALES NO PROVISIONAL SALES

CONSIGNO : [REDACTED]    08 Jun 2015 WAYBILL : [REDACTED]   REFNO:  SALESMAN: [REDACTED]
          Cucumbers English 1X LI 6KG
   DATE        SALES          PRICE        VALUE  QTYDEL  QTYSLD  QTYDIS  QTYPRV  QTYONH
   09 Jun 15     13           60.00       780.00
   09 Jun 15      3           67.50       202.50
                 -----       --------    --------
```

Figure 10.83: Example of detailed sales report

Summary note:

- Trust is an authoritative resource drawn on from the grower's side, but also forms an allocative resource on the agent's side that allows for control over the physical product. This transfers power to the agent. Trust provides power, in this case through the physical control over the product.

- Trust on a personal level is a critical part of the broader institutional trust structure formed on markets.

- Primary and secondary structures governs activities on markets.

- Ownership and control is central to the provisioning of a trusting environment. The market authority acts as a benevolent dictator.

- Integration of detail information on a frequent basis is used to provide assurances of compliance to growers in this case.

Table 10.4: Technologies-in-Practice enacted: Agent/Grower

Technologies-in-practice	Recording of transactions	Forced compliance	Monitor/Evaluate	Audit of activities
Primary Actor	Agency staff (via market's system)	Agency staff (via market's system)	Grower (own system)	Registrar of Act 12 (APAC)
Institutional Context	Agency working within the market's jurisdiction.	Agency working within the market's jurisdiction.	Grower who owns the produce being sold. There is spatial separation between the agent and the grower facilities.	The statutory body regulating the activities of agents.
Motivation for action	Recording of delivery to ensure stock control. Recording of sales transactions.	Perform sales function and report sales to grower. Customer service as response to queries.	Monitoring of transactions to ensure integrity of information.	As part of an investigation or as part of monitoring of compliance.
Knowledge of technological artefact	Salesman and staff are trained in the use of the market systems' workflow around stock receipt.	Salesman and staff are trained in the use of the market systems' sales and reporting procedures.	Unknown.	Knowledge to extract compliance related data.
Norms associated with the use of the technological artefact.	Norm of compliance forced by the workflow embedded within the market's system.	Norm of compliance to governance structure combined with personal integrity motivates use of system.	Grower monitors agent activity to prevent risk.	Norm of compliance informed by a regulatory mandate.
Action with respect to technological artefact.	All aspects of the product life cycle from receipt to sales through	Generating sales report and sending this to grower as	Unknown system.	List an enquiry relating to a trigger event.

	to payments are captured onto the central system.	per prescribed industry norm.		Monitor of compliance / non-compliance.
Features of technological artefact mobilised.	Functions relating to the receiving process. The sales transaction process (generating documentation for the removal of produce) The "back-office" system where all administrative functions are performed.	Facility to query and extract information relating to stock levels and sales transactions. Only static reports available. Facility to send these electronically.	Unknown system.	Query and data extraction functionality. Extensive reporting is available.

Table 10.5: Summary of structural dynamics: Agent/Grower

Description of relationship	Structure	Facilities	Comments
Agent and Grower relationship	Domination	Agent knowledge (about demand and supply forces)	Grower is spatially removed from the location where the goods are sold.
Agent and Grower relationship	Domination	Trust (Agent/Grower) as allocative resource.	Agent draws on the trust relationship to protect the supply of produce against competition.
Agent and Grower relationship	Domination	Mandate given to agent to sell on behalf of the grower. Trust used as authoritative resource.	This is provided as part of the agreement.
Agent/Grower/Regulator	Legitimation	Norms of ethical behaviour influenced by Act 12 (Rules) statutory requirements. Norms of good practise.	The actions are motivated by the protection of the interests of the owner of the product, namely the grower.

The following section discusses the role of the computer system on markets as a resource.

10.4.2 Mandate of market management

Market management enjoys a very powerful position on markets. They form the enforcement point of multiple layers of legislation (See Figure 8.66). This level of control was allocated to the markets due to the fragile nature of the commission system to self-regulate the high trust environment it

requires (as discussed in Chapter 8). The market certainly shows the patterns of the type of risk that Giddens (1990) refers to that are institutionalised within the functioning of markets. Acceptable risk is a good way of looking at the relevant risk profile of actors. *Acceptable risk* is central to sustaining trust (Giddens, 1990). When viewed from this dimension, the mandate of the market as a collective is to ensure that the acceptable risk that a grower faces sending product across vast distances without any formal contract, is just that *acceptable*. This is a subjective measurement but as the following illustrates the perceived relationship between rules within the collective and trust.

> "If you can trust that the rules work, the trust is *bigger than the rules itself*. If you *do not trust the rules*, there will be no trust anyway. You will have to follow the rule. If *everybody decides how a transaction is going to be done*, then there is trust. People tend to test the boundaries. If the rules are *consistently applied, it* creates trust. [Interview Ref.: 1:5773]

In order for the institution to address information and power asymmetries, the collective view of the participants should be that the system they are part of is equitable. That their enacted structures is in line with actors around them. In addition, the market management in this case has to address any asymmetries and needs to be in a position to do so. The computer system plays a central role (as an allocative facility) in providing power to the management to address any asymmetries.

> "[The computer system] is not just being used as a marketing tool; it is also used as a planning *tool*. We have looked at the farmers, at the information that they get and we realise that we need to *provide more information to the farmers they will also be given access through a web interface*. We are looking at integrating at a low level that a farmer can actually use his system to dispatch his product to the market, read in and confirmed, he *receives information exactly when it arrived*. At the market this is an important planning tool because of the turnaround, helps him to manage that side of his operation and gives him information if there is a problem and if there is a third party to take it up with the third party. Part of the *offering is to allow the grower to have information on the status w*ith the delivery and he can go in at any point in time and see what his product is being sold for, allows him *to raise a red flag* if he is not happy with his product and the enquire with the agent you have increased transparency, you are empowering the farmer in terms of what is happening with his product, you are removing issues of non-transparency and only knows weeks later where he stands with his delivery. That establishes improves the relationship of trust". [Interview Ref.: 1:5505]

The above extract illustrates the market's attempts to increase not only the service to the grower, but to balance the power with the agent, through the use of the central system. Although the previous section painted a picture of a trusting relationship between agent and grower, these relationships are often strained

because of the competitive environment on markets. Through the system, the market authorities provide access to the grower to correct information asymmetries. Through this, market management aims to provide more power to the grower as part of their mandate to ensure an equitable trading environment. Market management enacts structures as part of the process to *address power asymmetries*. Market management indicated that they want to allow the grower to draw on the system as an allocative resource to balance power and "to raise the red flag". The above is further supported by the following quote:

> "The system is a tool, in the past there was the hand system, the computer system is 80% for trading and 20% for information delivery. *My mandate is to create a trading environment,* the system gives me a trading platform, it allows to receive product in an orderly manner, to sell it in an orderly manner and to distribute information to the various stakeholders." [Interview Ref.: 1:4312]

Central to his role, is the power to enforce rules and the computer is a central component to fulfilling that mandate. This aspect is perhaps best described by the following two quotes:

> "The market will always be there to create unique opportunities, there is about 9000 producers and about 5000 buyers, which compete in a central point, the market provides the facilities, the storage, the computer system that creates a safe transaction. The market is the place where the buyers and sellers come together. A safe trading environment, the people feel safe to come to the market and deposit their money and deliver their product. *We have the power to dictate on how this is done. Power to apply the rules that all are treated and trading equally.* The mandate is that you are part of local government, you have to create a fresh produce market, you have the by-laws and you allocate a license to agents." [Interview Ref.: 1:4579]

This power to exercise this mandate also lies in a combination of *resources*:

> "… you have a couple of tools. Bylaws, procedures, etc. Contractually with all the stakeholders, *bylaws set out to control everything that you cannot control with a contract*, but is under national laws, the most primary law is Act12. There is an enormous amount of laws, environmental, municipal, systems and structures act etc. Most of it sets out to guide you, it is difficult to use these tools to a business benefit. Standard operating procedures, they must be in harmony to your system." [Interview Ref.: 1:5509]

This *ultimate* level of control requires the ability to access, on a very low level of granularity, the activities of its users. In order to achieve this, the market's computer system plays a vital role. All transactions within the market relating to the receipt and sale of produce (this includes the money being transferred between buyer and farmer) have to be entered on the central system. The market's computer system is owned by the market authority providing them with the resources to dominate actors and set collective norms. The computer processes are extremely prescriptive and in addition, user roles are clearly defined.

This frames the activities of all users on the system to such an extent that the anticipated actions become *extremely predictable*. As part of exercising this power, the software application on the market is moulded around the processes that serve the mandate of the market and leaves no ambiguity as far as how the processes should be conducted.

On its own, the set of regulatory frameworks does not provide adequate enforcement ability, but through the computer infrastructure, the market authority is in a position to use the system as a *tool* to enforce these governance structures. The system allocates power to sanction to the market authority and the market management draws on this to perform their role. The following quote further describes the positioning of the system as a tool:

> "There is accountability, the *system place responsibilities on the right places*. There is responsibility verses trust. The grower holds the agent accountable for certain things *through the system*. Market *management uses the system*, they pull certain information and they *hold people accountable*. It is also traceable down to the lowest level of detail. *The ability to trace back assists accountability*." [Interview Ref.: 1:5744]

The reference to "through the system" indicates the allocative power the technology provides to the management of the market. But the view is wider than that. This quote indicates the view that the mandate allocated to the management extends to not only a reactive approach to its role but also a pro-active approach. An extension of the mandate linked to the system: that of a grower that is spatially removed from any interaction on the market becomes visible (an aspect discussed earlier). The grower does not have direct access to the system but through the institutional governance structures, enjoys protection regardless of the spatial separation between the growers and their products. But this is not linked directly to the real-time environment, something the market sees as a future area of development. Market management enacts *enforce compliance* structures around the system in their role as custodians of the trust relationship:

> "Infrastructure service, safe place, concentration of buyer, *agents that are controlled*, price mechanism is correct, always demand for their product, *there is a way that the market keeps him on his toes. Market keeps people on their toes,* continuities, facility, buyers, volumes, competition and price." [Interview Ref.: 1:113]

The market needs to protect the interests of its main stakeholder (grower) explicitly. This includes providing an environment where firstly the produce is received and handled in a transparent manner and secondly the assurance that monies generated from the sales of the produce, is paid over and reflects the proceeds of the actual sales. As indicated in Chapter 9, the workflow around the receiving, storage and ultimate sale and removal is a transparent process to the market authority and to the agents on the facility.

This transparency relates to the publishing of all sales transactions related to the sales and payment processes. However, the transparency does not imply open transparency to all. The roles as set out in the system dictate the nature of this transparency as being selective and closely framed by the functions that are performed. The participants draw heavily on the available schemas within the market context not to position themselves only but also to direct others. The system aligns domination structures users draw from by providing a single set of rules governing all roles on the system. A buyer is treated like any other buyer on the system, is exposed to the same rules and has to act in the same manner, same for all other functions.

The consequence of this line of argument is that the various actors, by drawing from similar schemas (in a routine manner), also strengthens and institutionalises the shared meaning of the various group norms. As was seen in Chapter 8, the enforcement of the various formal rules on markets over a long period, lead to the common understanding of not only how these schemas work, but also why they are there. Both from a social (structuration view) as well as from a technical point of view (technologies-in-action), these structures are enacted and are similar amongst participants creating a predictable environment.

However, this situation is a delicate balance between the need of stakeholders to conform to a central set of rules/norms and the counter force of privacy and self-interest. The market system offers a good example of how, once there is buy-in from all stakeholders, the actor becomes a *willing servant* due to the acceptable risk and the commercial relevance of using that the institution holds. Apart from the transactional benefits of having a central system, participants are inclined to be non-transparent. By structuring the interests of the grower within a market as described, the owner of the product ultimately seeks to reduce their risk and as such, seeks the protection of a broader institutional environment. Similar dynamics are present from the agent and buyer perspectives.

Stones (2005) illustrates the interplay between the actor and fellow actors as follows. Drawing on the concept of the actor-in-context and the actor-in-focus, he describes the role that knowledge regarding future actions of actors-in-context play. This is valuable to approach the above examples in this manner. The conduct of an actor and that of fellow actors are not separated but are joined *by shared knowledge of interpretive schemes, power capacities and normative principles*. This grounds the actor within the behaviour (action) of fellow actors (collective context). In the above example, this approach becomes particularly valuable, as the shared rules embedded within the various participants in the market system

influences the reflexive abilities of actors to "… monitor the flow of their activities and the contours of the contexts in which they move." (Bryant & Jary, 1997:170).

> "[System as a power tool] is an everyday part of our lives. We have discussed all the business rules that people want to see in place and all the hurdles that needs to be crossed, systems *are used shamelessly to enforce rules down at ground level*, that the person doing the transaction that it is lead in such a way by the system that he cannot make a mistake, or any sort of mistake." [Interview Ref.: 1:5901]

The market's service consists of various supplementary and complimentary functions/services. In Chapter 7, one can see the difference in focus of market management in other international settings, influenced by the business model of that particular market. On markets that have independent wholesalers and where the management is just landlords, market authorities are less prone to be involved in the relationship between the grower and the wholesaler. On these markets, the management is in less of a power position to enforce the structures as described above to create institutional-based trust within their institution at the same level as the markets in South Africa. Not having a central computer system, will severely inhibit their efforts to introduce self-service type solutions of any sort. The market acts as a regulator, a *facilitator and stimulator* of transactions within a broader trading environment. But this role within the South African context is particularly pronounced and made explicit. This provides the platform for the provisioning of electronic services.

Aspects such as the ownership of the system are correlated to the ability of the market authority to exert power through the system and perform its regulatory mandate. Ownership of the system also implies ownership and control over the information. A key aspect of the systems function is transparency (discussed later in this chapter) through the control over the distribution of information. This allows the market authority not only to ensure transparency but also integrity of the information as well as protecting privacy of users.

At the heart of the transaction is the creation and enforcement of contracts. The underlying contracts, although there might not be any formal contracts, is an unwritten one between the grower and the agent and between the grower and the market. Although the role of the exchange is not to be part of the transaction itself, the enforcement of the contractual agreement is important. However, not being part to the agreement also poses mandate challenges. The role of a system is to put buyers and sellers together, but the fact that contract enforcement is part of that mandate means that this cannot be a hands-off approach. Although the facilitation role is there, the arbitration role provides security for users.

External safe guards act as "institutional risk absorption" (Bachmann & Inkpen, 2011). Trust is not just the result of "idiosyncratic interests of actors" (Bachmann & Inkpen, 2011), but also a function of the broader institutional context.

Regulation, monitoring and enforcement might not be part of the exchange itself, but as a transactional system, the need to enforce and use the system to perform regulatory functions is clear. The ability to perform these regulatory powers is another key aspect of facilitating trust. Can the Regulator for instance act swiftly to pro-actively engage with potential areas of fraud? Various acts and bylaws govern the regulatory and operational aspect of the market. These various sets of regulations vary between laws that govern the market's ability to operate the markets, regulate the activities of the agents and regulate the conduct of stakeholders between each other. These are various standards, certifications, service level agreements etc. Within early stages of relationship development, the combination of formal structures, personal contact and legal facilities all play a role. The existence of structural safeguards (legal agreements, certification and reputation) is most effective at early stage of the relationship's development (Bachmann & Inkpen, 2011). The nature of the engagements between participants are also of a short term nature, where the level of interaction is dictated by the specific needs of the participants. To provide such an environment the regulatory structures needs to perform such a

> "Contractually we are not party to that sales agreement, all our obligation is to put the buyer and seller in touch with each other, what happens after then is between the two of them."
> [Interview Ref.: 1:4603]

This section illustrated the importance of the system as a *structuring tool* within institutions.

Trust failure teaches us much about trust creation, in the same manner as distrust teaches about trust. According to Bachmann (2012), different types of trust violations require different ways of recovering from them. Trust violations (Lyon *et al.*, 2012) involve both parties to the transaction. Failure of trust does not imply the presence of distrust (Zucker, 1986). Parkhe and Miller (2000) call for trust and distrust to be viewed as separate concepts. Trust only becomes distrust if the expectation arises that the failure will continue. As Zucker (1986) notes, not matching the trusting party's expectation disrupts trust but does not cause distrust. It is only through continuous, generalised trust failure that suspicions arise and distrust is caused.

> "Thus, to distrust implies an attribution of intentionality and trust can be disrupted without producing distrust. This distinction is pertinent in light of environmental noise problems that complicate identification of agreement violations." (Parkhe & Miller, 2000:10)

According to Lewicki and Brinsfield (2012:36), the failure on a structural level indicates a:

> "... breakdown in existing structural monitoring and control mechanisms and repair strategies usually suggest remedies such as tightening control mechanisms, introducing new monitoring procedures, or legalistic remedies" (Lewicki & Brinsfield, 2012:36)

Tan and Thoen (2001) refer to control trust and party trust. Control trust refers to controls put in place and party trust refers to trust placed in the other party. These two aspects are complimentary. What emerges from the interviews are that the breakdown in party trust does not mean a breakdown in control trust (trust in the control mechanisms). Failure and recovery should be seen as one action. As the service fails, the expected outcome becomes depleted.

> "… assessments of customer satisfaction result from the comparison between predicted and perceived service, while service quality assessments are derived from the comparison of desired and perceived service." (Coye, 2004:56)

As Lewicki and Brinsfield (2012) however indicate, the measurement of failure and trust failure in particular, is problematic. This measurement could be expected to differ amongst different people. The maturity of the relationship might also have an impact.

> "If your trust in the enforcement agency falters, you will not trust persons to fulfil their terms of an agreement and thus will not enter into that agreement … It is this inter-connectedness which makes trust such a fragile commodity." (Dasgupta in McKnight, 1998:482)

This section concludes with some summary notes on the discussion as well as Table 10.6 and Table 10.7, which summarises the structuration characteristics described in this section. The following sections continue the discussion around the system as part of enforcement.

Summary notes:

- Information is seen as a resource to correct power asymmetries.

- Routine action guided by set rules institutionalises trust perceptions.

- Computer system is used by the mandated owner to correct both power and information asymmetries.

- System functionality and design is aligned with the institutional mandate.

- The actor's norms are informed by the mandate provided by the institutional governance structure (this includes trust based mandates).

- Norms of actors show similar characteristics surrounding the view of the market system as an extended tool of enforcement.

- Shared schemas, leads to predictive action of actors and this could support the formation of trusting behaviour.

- Acceptable risk is a measure that actors use to determine the level of engagement.

- The power to sanction assists in the strengthening of legitimation structures.

- Future action is also grounded in group norms.

- The technologies-in-practise manifests in a similar way among the sets of user types due to the institutionalised governance structure.

Table 10.6: Technologies-in-Practice enacted: Market's mandate

Technologies-in-practise	Enforce accountability	Correct power asymmetries	Establish authority
Primary Actor	Market management	Market management	Market management
Institutional Context	Owners of the market facility and computer infrastructure. Regulatory function around the sales process of consigned product	Owners of the market facility and computer infrastructure. Regulatory function around the sales process of consigned product	Informed by an institutional mandate. Intention is to enforce power in alignment with this mandate. Distribute information to support price discovery.
Motivation for action	Enforcement of breaches of procedures and rules. Enforcement of regulatory requirements.	Power asymmetries between grower and market agent. Risk of potential opportunistic actions of the agent.	Knowledgeable about the application of the output from the system.
Knowledge of technological artefact.	Management level knowledge, not	Conceptual ideas about requirements.	Norms of protection the interest/s of growers. Norms of transparency. Norms of rule enforcement. Norms of accountability. Norms of responsibility.

	Norm of enforcing accountability.	Norm about unfair power distribution.	Use of the market's computer system to draw activity related information.
Norms associated with the use of the technological artefact.			
Action with respect to technological artefact.	Access exception flags raised by system.		Searchability of detail data with reporting functions.
Features of technological artefact mobilised.	Various exception reports.	Distribution ability of information. Remote access facility to	Access control. User role allocations. User rights enforcement.

Table 10.7: Summary of structural dynamics: Market's mandate

Description	Structure	Facilities	Comments
Market management / Agent relationship	Domination	Market computer system ownership.	Ownership is an important prerequisite for control.
	Domination	Regulatory mandate to enforce both internal and external governance.	
Market management / Grower relationship	Domination	Allocation of access to computer facility.	Address power asymmetries between grower and agent.
Market management versus users.	Legitimation	Establishes collective norms.	Use of sanction to enforce group norms.

10.4.3 The computer system: a tool to position actors

The market management throughout the discussions had a very specific view about the use of the system as a tool to affect and control the behaviour of role-players on the market. Legal and technical assurance is important in perceived trust formation (McKnight *et al.*, 2002). Specifically the strong power position of the agents is a constant theme and informs strategies relating to change (changing the core selling-model from commission to auction as an example). This underlying balancing of power emerged as something that the market management sees as part of their role. The following quote from a senior market manager illustrates the direct approach taken to correct perceived imbalances in the system:

> "I think that one of the things markets really need to work on going forward is information and the quality of information. At the moment the information is *mainly in the hands* of the agents all information related to product, that influences trade for instance how much availability is there of a product. If I was to as a buyer walk on the floor, I can get a sense of what the availability of products is, but as an agent, I know what the availability of products is. It is the *information that is not quantifiable* on the system they know things because they gather information through other methods. It puts them in *an advantageous*

position towards the buyer, which means that the buyer needs to make an effort to understand the market on any given day, for him it means he has to do a physical walkthrough of the market, he has to assess the availability of the product and the quality of the product, he also needs to access what the demand is for the product. That is the only thing that is the unknown for both the buyer and the agent, is the demand. The buyer also has certain information." [Interview Ref.: 1:4421]

[Interviewer: How would you address the situation?]

"I think there are two ways of addressing it, firstly by giving the buyer a system where they can *openly compete for the product* and know real time what the competing bids are for the product that would also mean that they will have to have access and you will have to ensure that you could adequately address any risks associated with that. And the level of information has to be protected; you do not want to disclose buyer A's trade to buyer B. It must always be an anonymous transaction. I think the system best suited for that is an auction system, because then you can make that available. We need to answer all the questions around that first. One of the challenges you have on the market, is because of these *perceptions of preference*, you can make the system available on a partial basis. You do not bring it in and through the other one out as a parallel and you determine the most suited products to trade on the auction system. Will that address the feeling of trust or will it just be a better way of transacting? The first positive is it puts him in the same position as the agent, he knows what stock is then available and through the system the demand for that stock will then be revealed. He can see what prices is being offered because it will show because he has access to the trading screen. So he can monitor the trading screen throughout the auction, to see what the real demand is for the product. He can get a sense of whether he is offering too little or too much for the product. I think I belief that process gives the trader a greater sense that the *price that he has paid reflects the market* and that is not subjective, that the dynamics that took place are a far more accurate reflection of supply and demand, which as you know is what the whole market is based on. So once you can satisfy a buyer that the price that he is taken is *a truer reflection of supply and demand*, by implication you are also establishing a greater sense of trust and faith in the system that you are giving him, you are *removing the issue of subjectivity* and also the associated negative implications of subjectivity. So in that way I think technology as far as markets are concerned can play a major role in changing the attitudes of buyers towards the system and establishing longer terms relationships with the buyers. Everything I said here holds equally true for the producer." [Interview Ref.: 1:4254]

This extended quote illustrates the active role the market authority plays to correct perceived asymmetries within the system. Aspects such as perceptions of preference, removal of subjectivity and the positioning of the buyer's decision (in this case) within a broader context inform the market management's view and approach.

The system, due to its high levels of transparency, allows users to draw not only on the facilities of the organisation they belong to but also on the facilities of the collective institution. This effectively positions them within the collective and allows the collective in turn to affect the perceptions of the actor. In the

case of prices, it is not the price that a buyer pays that creates a breach in trust, but the prices they pay that are *out of sync* with the other buyers. The actors' expectations regarding an issue such as price might change but they constantly require an indication what the aggregated environment is doing.

A more real-time environment is seen as providing a more realistic set of signals where all actors can "see" all activity to remove any perceptions of subjectivity of preference. Information asymmetries are described as being a source of power imbalance within the trading process. The positioning of the buyer in this case within the broader environment is a significant part of providing a solution that seems subjectively fair.

> "I think the trust relationship relies on what the expectations of the user are, vis-a-vis the system and the level of utilisation of the technology that is given to the user. Well for instance, many organisations allow the user very basic interactions with their system, if you consider banks as an example, the very first time you got involved with the technology of the bank was when they put their ATMs down, the only thing you could really do was get balance enquiries maybe draw a mini statement; it later on revolved into the withdrawing of cash and the depositing of money. From the user perspective, the trust is more than just the reliability of the system, that is the accuracy of the system, when I interact with you, I get the expected results from the interaction. So for instance if I bought something from your system, your system then provides me with information that verifies that transaction with me, for me it is a very low level, it is a basic interaction of the system. So meeting the trust requirements are very low, because of that, it is related to the level of interaction. When you look at a market and you understand the dynamics of a market, there are a lot of related issues that could come out of that relationship. And that is because the buyer is negotiating the price for the product that he has. *On the basic low level requirements of trust, you can give him information that relates to that transaction. But your other issues influence the level of trust of the buyer, those issues are for instance, did you get a fair price in your transaction with the market, what kind of pricing is being given to basically people the market does business with that are his competitors. So is he actually getting a fair deal or is there preference being given to others and what would the reason be for that preference.* So in the process of sales it is a well-known fact, different buyers are given different prices and there is a cause for concern as to whether the logic behind it is defendable and it is often tested, some of the logics that prevail would be whether the volumes influencing price and you will find that the agents will argue that volumes influences price, they are prepared to look at beneficial pricing in terms of volumes, there are challenges relating to quantities that are available, how does one allocate product to a buyer when the demand is more than the availability, who get preference and who does not and why do they get preference. [Interview Ref.: 1:4899]

Trading parties on markets use the market's information to determine *where they stand in terms of other role players*. This aspect does not lie in the actual price paid or achieved, but rather the price *relative* to other parties. The following quotes illustrate this:

"… actual trading in the market should be reflected so that the buyer can have an insight in how prices are established and the recommendation in that regard was that one should have an information screen that is reflecting trade daily on the market and you will find that there is a need that is expressed by some buyers and I think that if one is to address that level of confidence, one of the issues that comes out of this is how do you establish a long term relationship with *your buyer if your buyer believes that he's actually not being treated equitably in relation to other customers"*. [Interview Ref.: 1:5699]

"I think I believe that process gives the trader *a greater sense that the price that he has paid reflects the market and that is not subjective,* that the dynamics that took place are a far more accurate reflection of supply and demand, which as you know is what the whole market is based on…" [Interview Ref.: 1:5710]

"… so once you can satisfy a buyer that the price that he *has taken is a truer reflection of supply and demand, by implication you are also establishing a greater sense of trust* and faith in the system that you are giving him, you are removing the issue of subjectivity and also the associated negative implications of subjectivity." [Interview Ref.: 1:4550]

"The system allows the farmer *to benchmark him against the market*; he will have statistics where he can compare his products against the competitors and also against the other agents on the same market. What do you do *by giving him this type of information*; you are putting him in a position where he can have *bargaining power with the agents*. You *actually put the agents under pressure* to perform and by that you introduce a more competitive system than what you had before. In the sense that agents are not really competing to get a better prices, they are more order takers than what they are salesman; also there are other influences that reduce the competitiveness. If you look at you largest buyer for instance and the power he is seen to have on fixing price. Which is not a bad thing, it needs to be there. It can subjectively influence the price made by the agent. There are buyers that will clean the floor." [Interview Ref.: 1:4264]

The ability of the user to position themselves within the context of other's actions allows for the benchmarking of activities. In this case, price is a critical aspect for all role- players. Price is both a performance measurement tool between the supplier and the agent as well as a profitability variable for the grower and buyer alike. The agent's ability is measured through the price the agent achieves measured against the broader market's aggregated prices. Suppliers on the other hand will compare the agent's performance also against other channels. Buyers are competing against other buyers and the price they buy at affects their ability to be competitive further down the value chain. With various buyers competing for the same consumers in many cases, even a small additional margin can make a competitive difference.

Allowing for the positioning of transactions creates a sense of transparency, removing subjective perceptions of the real trading activities and reduces perceptions of opportunism. Positioning actors also assists in the self-regulating of the activities as actors refer to the actions of the group and this in turn

influences their response. For a self-service platform, the system can be used to signal to actors their position within the broader environment. Enforcing higher levels of transparency creates the perceptions of fairness, that hidden action is less likely and that the outcome of the transaction is perceived fair.

Summary notes:

- Systems should allow for the alignment of the various perceptions around the subjective measurement of fairness. Systems should be designed to allow the various actors to enact similar technologies-in-practise relating to the use of the system. Through this alignment the actor requires less external verification.

- The ability of actors to measure their expectations and norms to that of others contributes to their trust in the system. The level of predictability they experience increases and in turn influences trust forming perceptions.

- Actors position themselves relative to other actors and through this creates perceptions about fairness and trustworthiness of contextual elements.

10.4.4 Email chain: Describing power relations

The following is an illustration of how power is exercised by the various levels of governance. In this case, the grower is instructed to adhere to a directive of non-compliance. But the email chain illustrates how the power is aimed not at the grower directly, but indirectly. *Enforcement is aimed directly at the user that functions within the system*. The fact that the agent is *within* the system frames them as *the point of compliance* and shows how the agent ultimately relies on the market's norms for equal treatment. This example illustrates how the various levels draw on various structures to enforce non-compliance and how they interact and align to enforce compliance (Table 10.8).

A physical inspection on the agent's floor uncovered non-compliance to the set marking standards. The emails start with a mail from the department to the market (Email 1). The instruction is directed to the market authority for action. The market issues a mail to the agent informing them of the incident and requesting action (Email 2). The agent provides certain reasons and arguments in response. Table 10.9 provides a summary of the various structures formed as part of the exchange.

Table 10.8: Email exchange: Department, Market Management and Agent management (Real names hidden/changed)

1. <u>Email from Department of Agriculture, Forestry and Fisheries to the Market Management:</u>

From: ▮▮▮▮▮▮

Sent: 27 March 2014 01:37 PM

To: ▮▮▮▮

Cc: ▮▮▮▮

Subject: directions issued

Good day ▮▮▮▮,

Hope all is well with you.

We issued a number of directions today at AGENT A (I will email them on Monday). All the directions we issued today will expire on the 15th April. Should the producers not have made an effort to comply, we will go to the judge to obtain a warrant of seizure so we can be able to block the products on the system.

Regards,

▮▮▮

Agricultural technician, Inspection services, Department of Agriculture, Forestry and Fisheries

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2. <u>Email from Market Management to AGENT A:</u>

From : ▮▮▮▮

Date: Tue, Mar 31, 2014 at 4:17 PM

Subject: DAFF "Directions" issued for Non-Compliance

To: ▮▮▮▮

Hi ▮▮▮▮

The mail below and attached refers. It appears that DAFF had performed inspections at AGENT A last week Friday and found a number of consignments that did not fully comply with marking requirements.

In turn, they had issued "directions" (attached) to rectify and that failure to comply will lead to legal action/seizure of the products concerned. You will agree that most of the products would have been sold by now.

Nonetheless, can we urgently meet tomorrow morning to discuss further.

Regards

3.	Email from AGENT A to Market in response:

From: ███

Date: Wed, Apr 1, 2014 at 1:55 PM

Subject: Re: DAFF "Directions" issued for Non-Compliance

To: ███

Good day ███

We take cognizance of the Directions issued on the AGENT A's Vegetable Floor on JoBurg Market.

We are committed to get our Industry and producers in line with the act and to comply with all necessary regulations.

I do however have to express some concerns:

1. Are we making sure that these directions are sent through to the relevant producers for action?

2. Are the measures taken on the Agent's Floor with the Agent's producers done consequently on all other sales floors of other market agents?

3. Are these measures taken also taking effect on all the other fresh produce markets?

4. Are these measures also enforced in the retail sector?

I also have to caution on the following:

1. If these measures are only taken on one agent's floor (AGENT A in this instance) and not on the same level on other agent's floors, this will cause huge friction. This might lead to producers leaving AGENT A and supporting other agents where these measures are not being enforced. This will then automatically lead to a whole new dynamic with its own consequences.

2. Are these directions and actions also enforced on other markets? If not, the Joburg Market will most probably facing producers leaving the JFPM and supporting other markets. This will have a detrimental effect on price discovery, which will again in its own right lead to collateral damage or actions.

3. Should DAFF resort to the extreme measures where produce are seized, without the necessary guidance and time to rectify these matters, this will also lead to the markets, agents and producers losing money and facing legal battles beyond our control.

We do understand that DAFF is empowered by the act to carry out these actions. We do not dispute the fact that producers should comply with the act.

We do however call on DAFF to phase in this process, communicate to all relevant producers and agents. We further urge DAFF to be consistent and consequent through the whole fresh produce marketing system and not to target producers on one market, or one market agency. Failing to do so might have catastrophic consequences to those markets and market agencies.

We are open to engage with DAFF on this matter and be part of the solution to these challenges.

Kind regards

███████

Table 10.9: Summary of structures: Email exchange

Description of relationship	Structure	Facilities	Comments
DAFF to Market management	Domination	Legislation covering the packaging and grading of price on the market floor.	Department issues a directive to the grower but communicates via the market authority.
Market management to agent	Dominance	As owner of the agent's license and the condition of trade (which is aligned with all national legislation).	Agent draws on the trust relationship to protect the supply of produce against competition.
Agent to Market management	Legitimation	Norms of fairness Norm of acknowledgement and recognition of authority.	Agent's response is to turn to norms to protect their interests.

10.4.5 Views of information within the market

Continuing the theme of the importance of information, this section elaborates on references made regarding information and its role on the market. Information has the potential to destroy trust if not presented accurately and with integrity. Again the central role of the computer system and the ability to not only channel and deliver relevant information, but to act as a resource that is used by actors to reference and contrast their actions. According to Ederington and Dewally (2002), sellers rely on four basic signals to differentiate their products:

- Reputation system;

- Certification by a third party;

- Warranties;

- Information disclosure.

All these aspects form part of the information pool that actors draw on. However, information plays a wider role and allows the facility to build trust. Information flow between the parties consists of both the exchange environment and tacit sources (experience, industry knowledge, verbal communication). To

enhance trust the informational role needs to be extended to other sources to be relevant. This goes beyond merely providing data. The recommendation of the initial Section 7 (1999) report reflects the following:

- All intermediaries' information needs to be captured.

- Real-time information needs to be supplied.

- The information system should be supported by enhanced grading and packaging systems.

- All markets should disclose standardised information.

- An information-council was proposed to deal with dissemination of information.

- Information was felt to be only available to market participants: buyers, agents, producers and not to competitors.

The following quote refers to the Section 7 findings and illustrates the need to correct information asymmetries to provide a level of perceived fairness and reduce potential opportunistic behaviour:

> "[Do these trade issues affect how they view the system?] It affects how the people view the system, they could perceive the system as being inadequate and there is a gap between what is happening with trade and the system. What I mean by that is that one of the, ...you may recall there was those investigation into markets systems and trading and one of the recommendations that came out was that there needs to be greater transparency on the trade side of markets. Actual trading in the market should be reflected so that the buyer can have *an insight in how prices is established and* the recommendation in that regard was that one should have an information screen that is reflecting trade daily on the market and you will find that there is a need that is expressed by some buyers and I think that if one is to address that level of confidence, one of the issues that comes out of this is how do you establish a long term relationship with your buyer if your buyer beliefs that his actually not being *treated equitably in relation to other customers*. So you have seen for instance the Johannesburg market has put up an information board showing the trade, but they put it up not showing individual trade, they show it at a global level, which I think is a step in the right direction. *Because it give the buyer a sense of what is happening on the floor and by doing that I think the Jhb market has started to address those issues that are trade related with technology. By doing that I think they are creating the necessary atmosphere of trust between the buyer and the offerings of the market.*" [Interview Ref.: 1:5699]

The information flows are of course much broader than just pricing type information. This includes the broader information landscape generated by many others. One cannot merely assume that information is suitable and thus a special effort is required to verify the information of all types presented to users.

The view that the institution needs to be more transparent is apparent from the recommendations of the various investigations. A practical example is the need for trading screens on the trading floors that has been expressed in the Section 7 report stating:

> "The possibility of introducing a live trading screen was discussed. It was mentioned that standards in terms of product grading were not applied uniformly across markets and that this could result in confusion if live trading information was provided. It was mentioned that at present real time prices and volumes were only available to commission agents. It was agreed, however, that the price discovery mechanism should be reviewed to ensure that it was able to keep abreast of technological developments and customer requirements." (Section 7, 2006:50)

The challenge is that information defined in this context involves only system-level pricing information. It is the complete pool of the explicit and tacit that ultimately plays a role in decision-making. Information is about more than just trading information but also about third parties:

> "We have to be sharp. Chains expect us to be a complete source of information, so we have to be involved in forecasting as well as helping them with ideas in retail. You have to be a value added provider, not only to the chains but also right down to the consumer. We have to listen to the consumer and pass this information along to the retailer." (Rusnak, 2003)

The fact that information is retrieved from an objective source enhances trust:

> "If I can refer to a specific segment, the informal sector, a SST that they have is where they can go to the website, where they can see what is available and the price of the products. SST and the availability of the information and the use of the information, he knows that the information that he gets *is directly from the market system, it is not created by somebody*. The fact that he has access to it creates trust". [Interview Ref.: 1:4296]

The following quote illustrates how quickly all information structures can disintegrate if there are any reason to doubt its source. In this case, the agent describes the trust relationship between himself and the buyer. When there is any doubt, the parties resort to manual actions for verification. In this case, the buyer will resort to seeing the product.

> "... the buyer can trust you, whatever you tell him and whatever you say, he can trust you so explicitly that he does not even want to look at the product. *If a buyer comes to me and says he wants to see the product, there is a situation of distrust.* If the buyer phones me and says he wants this and this and this and I can say to him I have that and that and that and

he trust me that what I have got is the quality is what he buys at the price that he wants, that is where the trust starts forming". [Interview Ref.: 1:4386]

From a grower perspective similar views were expressed:

> "If the farmer does not have trust in the information that comes back, he will very quickly want to physically verify issues. If that product is sent, there is a portion of the transaction that involves high trust, the agent will off load the product he will sell it at the highest price to the right buyer and also tell the farmer why the product did not sell. If somebody inputs information correctly but it does not come out correctly then it destroys trust". [Interview Ref.: 1:4452]

Information and the integrity of information emerge as a key aspect of electronic-enabled environments. In addition, the ability to verify physically any suspicions, but more importantly the role that physical verification plays. Within the market environments the physical control and verification is part of the market's mandate. Any issues relating to suspicion of opportunistic behaviour is raised within the governance structures where it receives immediate reaction.

Summary notes:

- The need for greater integration and distribution of information is again highlighted. The link between information and any questions around the integrity of that information requires physical verification. The ability to integrate physical verification is noted as an external information sources that needs to be incorporated to improve signalling.

- Actors draw on the governance structures as a source of recourse. This is a secondary source that needs to be trusted.

- The central system forms a point of enforcement. Power is consolidated to affect both individual and group norms.

10.4.6 Sharing of information: The export channel example.

Central to the concept of trust is information and its quality and granularity. Full information is critical to the process of creating trust (Giddens, 1990). Creating a flow of information between the parties is less of a technical challenge and more an issue of trust between the participants in the exchange as the quote below illustrates. The following extract emerged as part of an interview and shows the different dynamics present both outside of the market systems and within the export environment. This serves as a good

contrasting example of how different institutional structures (export channel) yield a completely different environment relating to information sharing.

Ownership of systems emerges as a key element prohibiting the sharing of information. The issues and potential solutions raised in the previous sections stand in stark contrast to the dynamics one faces when implementing self-service solutions. In the previous sections the solution is a more technical one but in this case, the underlying fragmented ownership and governance structures challenges the implementation of integrated solutions. These are the comments from the service provider that provides the majority of systems to exporters. They face numerous challenges towards creating an integrated information system as is available on markets:

> "It would be good if the producer could just go to the internet and fill what his estimates are. *Sharing of information in the industry is huge, people hold on to the information and they do not want to disclose.* Sharing of information does not happen openly, the information *does not belong to us* so we always *need permission* to disclose any information*, even if it is statutory reports like PPECB*. Even with Agrihub that we are starting up, where we do collect information and it is just statistically information in the industry, we need permission on all levels from producer to pack house to cold room to exporter to port, every point that we want to *extract information from we need permission letters* and for the once that we do not have we cannot disclose information. But if you look at the benefits, *potentially somebody could go online and look at the stats for the industry* and yet they do not want to do this. If the guy up north in this week we delivers grapes and he is the only one then everybody knows that it is him then everybody can calculate how much many he is making. In cold rooms, where the pallet is out of age protocol, then not many people want them to know it, because there are claims against it.
>
> The whole thing about Durban and the block out situation in Durban [in reference to a block that was placed on exports due to fruit quality], nobody wants to release any information, nobody wants to provide a global view of trucks coming and gets routed, then the cold store next door will know who I am dealing with and how many pallets I am taking in and how much money I am making. It becomes very competitive in terms of rates then, who wants the business. They will tell you straight the sorry, I [the grower] do not want anybody to know whom I am dealing with and what my capacity is, how many pallets am I taking in for the season. Very price competitive and there is no loyalty in terms of that at the end of the day. The produce will sell to anybody as long as he gets the best price for it. It becomes very competitive with your cold rooms and pack houses." [Interview Ref.: 1:5308]

As illustrated here, information is seen as a source of power and something that the owners would like to protect (hold on to). The export environment is much more fragmented and no single system connects all the participants as in the case of the markets. The comments are made by the service provider of the system, which illustrate the frustration when a service provider does not act under a central ownership and

governance scenario like the integrated one found on markets. Again, the theme emerges that actors would not choose to be transparent by themselves. In this case, the systems fall outside the centralised governance and ownership structures as is found on markets and this greatly reduces the potential to correct information and/or power asymmetries, as there is no central authority. Access to information and the ability to control it, is a key source of power (Markus & Pfeffer, 1983; Hoffman, Novak & Peralta, 1999).

Even if permission is granted, the service provider is prohibited to provide information to the broader industry. The above illustrates the role of a *misalignment* between the governance structure, system provider and ownership. To achieve any level of institutional benefit from such a situation is not possible. The export industry has been struggling to create a centralised information distribution system as is working within the fresh produce market environment (See reference above to Agrihub).

This aspect also affects the ability to coordinate activity. The following reference should be read with the gogargo.com example highlighted in (Section 9.2.3). This refers to the same dynamics as was experienced in the gocargo.com example.

> "From my point of view, if you have information and you know where the problems are so that you can resolve the problems to cut cost and improve service. For instance if a two farmers next to each other, why share a container to cut cost costs? They bring two transporters in and two different containers in to load. If you have visibility on who is going to load what and you can share transport costs that *could be a self-service if the information* is published, but they do not want to do it. We all talk about saving costs and resolve issues in the industry and yet nobody wants to share information to do this actually." (Interview Ref.: 1:5913)

Without the creation of a governance and ownership structure to facilitate integration on system, information and process levels, the provision of self-service solutions is a challenge. Institutional trust plays a critical role in aligning the expectation of the actor with the intended use of the information. The ability to generate, collate and access low-level data is a real hurdle to the efficient integration of various role-players (Refer to Chapter 1: Vodacom example).

> "Convincing so many companies in manufacturing and retailing to try to work together in a
>
> highly competitive environment, that sometimes strained contractual relationships required
>
> a clear focus, realistic objectives and a promise of tangible benefits." (Benecke, 2007:42)

Table 10.10 summarises the dynamics as discussed in this section. The next section continues the discussion on information and considers the role granularity of information play.

Summary notes:

- Ownership of systems and information needs to be centralised for the institutional level to force transparency and to use information to address information asymmetries.

- Governance structures (even statutory structures such as PPECB) find enforcement difficult if the governance, enforcement and technology platforms are not aligned.

- A distinction has to be made between the service provider and the owner of the system, as these are not the same entity by default. It is the ownership of the system itself that affects access to and use of information.

- Information ownership and control is a resource that provides power.

Table 10.10: Summary of domination structures: Sharing of information

Description	Structure	Facilities	Comments
Service provider vs grower (off-market)	Domination (Service provider)	Service provider has limited ability to affect change. Weak, cannot draw on the system as a tool to affect change.	Technology and process needs to be integrated in a single framework. A mandate (tacit or explicitly) is required from the grower in order to distribute the information.
	Domination (Grower)	Ownership of information. Ownership of system through a license.	Assurances regarding privacy are crucial. Information not shared because of fear that competitors will use it to their advantage.

10.4.7 Role of granularity of information

The granularity of data further influences integration, enforcement, inspections and ultimately the ability of the platform to provide transparency (Landier & Thesmar, 2011). This section provides an example of how other channels are unable to reach the same level of institutional cohesion as on markets preventing the building of trust within the collective. Conflict around ownership and detail is apparent from the interviews (as discussed in the previous section). Owners would like to shield their information to prevent any competitor gaining any advantage and to avoid regulatory functions to interfere with production. Ironically, in turn actors would request higher levels of transparency from other role players. A balance needs to be sought. The situation differs between the various channels; on markets control of the system is in the hands of the market authority, while off-market, individual organisations own their systems and

data (See the discussion around the export channel and information sharing). On markets, the same forces are encountered where role-players would like to be less transparent if given the choice:

> "Transparency is another one. *The wholesalers do not want a transparent system*, because if it is transparent they cannot wheel and deal. Market users want a transparent system. You would like to not pay more than another buyer. If I look at the system, because prices fluctuates due to the spot market you would like to know that you are not becoming less competitive. The more information available, the better." [Interview Ref.: 1:5840]

> "Initially people verified all information. Trust in the stats came from the credibility of the source. The information credibility impact on the behaviour of people on the floor. Farmers like 100% transparency – it travels with the risk. *The buyer wants to stay under the radar* and the agents protect their information against competition." [Interview Ref.: 1:5657]

The system balances the power between the agent and the wholesaler and the wholesalers cannot circumvent this to avoid transparency. None of the participants has the power to change the rules governing the collective benefit to the group. From a business perspective, technology is not required because it is faster or more powerful, but rather because it is integrated into the business model adding value to the processes (Spohrer & Maglio, 2008). The forced sharing of information needs to provide a shared benefit to users. The reference to 100% transparency, not only of the individual's information, but also around the aggregated information generated adds value to users within the system. These tangible benefits in the case of the markets are the collective institutional guarantees and the protection it provides. In contrast, the export channel struggles to realise such a benefit due to the inability to control the lower level data.

> "If you exporter just look at the statistics and does not look right, then this undermines the trust in that information source. If you go to the individual companies (FPEF member) and you show that their information is reflected correctly, then that is a way to build trust. To have trust in the information it needs to *be on a very low level, high grain,* but then you run *into the ownership issue and privacy,* to get a healthy balance between the grain, the publishing and the trust is important. It depends on the specific application, I refer to statistical information the industry as a whole. If you drill down to the detail level and you look at a relationship between an exporter – DOLE – and one of their pack houses as a service provider, then there is a strong trust relationship, the transactional information from the *pack house that is generated to dole's system*, then that needs to be used just like that, dole will be close to this process and dole will have a short list of suppliers that provide them the least amount of issues around information provision. *A healthy track record around information deliver must be accurate and no-one can fault the information."* [Interview Ref.: 1:4491]

To facilitate trust one needs information at a very high level of granularity. The above example is drawn from the experiences within the export arena. The issue of ownership and privacy affects the level of detail

that can be provided. High levels of detail (and real time) implicate the direct access to the data sources and/or at least some form of data extract. This in turn implies permission to access such a source. Within the market environment, the governance structure avoids this situation and allows for the sharing of information. It is part of the "contract" that one has when using the system.

One should also distinguish between a pre-trust and post-trust situation. Once the relationship is established, the trust relationship provides benefits as is illustrated in the DOLE reference above. But this relationship needs to be established and as the examples indicate the cost of doing this is enormous if there is not a strong governance/ownership approach towards integration in place already. These examples occur within a very strong hierarchical channel. The challenge is considerably greater when moving away from hierarchical environments to more hybrid structures (Chapter 6). The validation of information against a set of rules increases the perceived value of that information as described in the following example:

> "Then there are an enormous amount of rules from the export agent or organisations point of view, that differs between the role-players that the system needs to provide for. It has to do in our lives, the information that is generated at all the different activity points, that when this gets put together within the logistical businesses or export agents like DOLE or CAPESPAN, that the information is usable immediately on transactional level already is validated against their rules and their code structures and is from a certain quality form their perspective for usage." [Interview Ref.: 1:5898]

The level of granularity and the ability of the market to provide transparency are directly related to the underlying business model:

> "… in the case of the market it is important to distinguish between the commission market and then the normal concept of a market, many points are based on the role of a market, it fulfils the gaps between buyer and supplier, by acting as a consolidation point as an information point, with the farmer that is far away to reduce his transaction costs. But the level of *transparency that the commission market gives* that distinguishing between the normal function of a market and the function of a commission market because this has different implications on how you look at concepts of a market". [Interview Ref.: 1:4532]

Within the context of markets, the concept of transparency is related to the design of the system. As the system is owned and controlled by the market authority and all participants are forced to enter all deliveries onto the system, a high level of transparency is achieved.

- Self-service requires a specific institutional structure to support trust building. The ability to align the governance and technology layers provides a platform through which the regulatory structures can create an environment in which trust can be built.

- The institutional structure needs to show the characteristics of a hierarchical structure.

Table 10.11: Summary of structural dynamics: Granularity

Description of relationship	Structure	Facilities	Comments
Market management	Domination	Information level of granularity. Power to use control over system and rules to dictate and enforce compliance. Ownership of computer system.	Low levels of detail allow the market management to address transparency within the market as well as outside it.
Wholesaler's view on information distribution on markets	Domination	Transparency is viewed as a negative aspect as it prevents the "wheeling and dealing" potential for opportunistic trading. The rules of system use prevent the buyer from not being transparent.	Technology and process needs to be integrated in a single framework. A mandate (tacit or explicitly) is required from the grower in order to distribute the information.

10.4.8 Description of market system users

This section explores the role allocation within the market's central computer system environment. The various users all perform specific roles that are clearly demarcated and embedded within the functioning of the system. All users are authenticated within the system with either a password and or a smart card (Figure 10.84). The market authority employees (M) perform inspections, grading, cancellations and cashiering functions. Buyers (B) perform buying functions but have minimal direct interaction with the system. Agent businesses are also registered as trading entities and all their employees (S) are linked to a particular trading entity. The salesman has access through the agent as a sub-user.

Permissions are determined by the various roles that are performed by users. The system does not allow different agents to view each other's information as only the market authority has full access to all facets of the system. But each user has access to information that either directly relates to them or that is part of performing their duties. Each user's role frames them in alignment with their functional role that they perform. The market management needs to apply the rules, which is structured to prevent any of the sides destroying the integrity of the collective institution. Figure 10.84 illustrates the users' environment within the system.
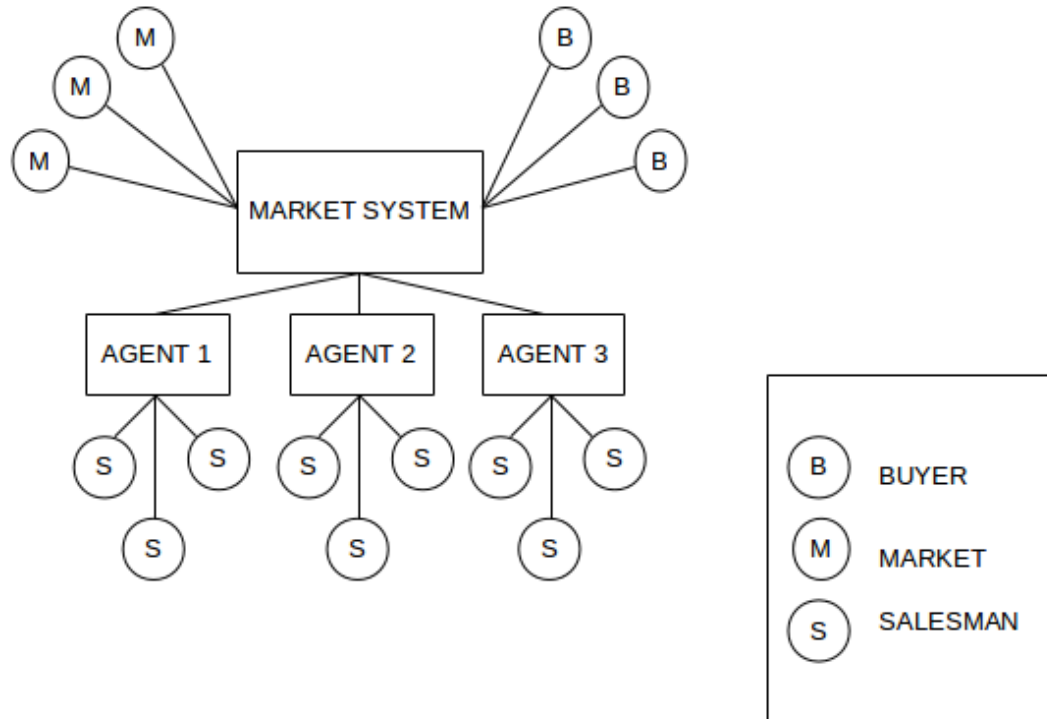
Figure 10.84: Market system users
Source: Field notes

The main sales role is that of a salesperson. As discussed in the initial sections, the salesperson is not only a user but has to be registered with the market and hold a valid trading license. Inside the agency, these roles are typically hierarchical with the senior salespersons as the head of the business unit having various sub-sections below them, which could be junior sales personnel, booking clerks and operational personnel. Buyers interact with the system only through the deposit and withdrawal of monies.

The business allocates internal staff functions and roles according to the structure of a particular business unit (Figure 10.85). The system allocates system permissions to users as part of their profile. These two approaches to the user profile work together to shape the user's activities on the system allowing them to perform functions relating to their job functions. The business allocation and the system allocation are not always aligned when some users assume roles from a business perspective that are not defined as coming from a system perspective. A good example is people acting as sales people that are not registered as such.
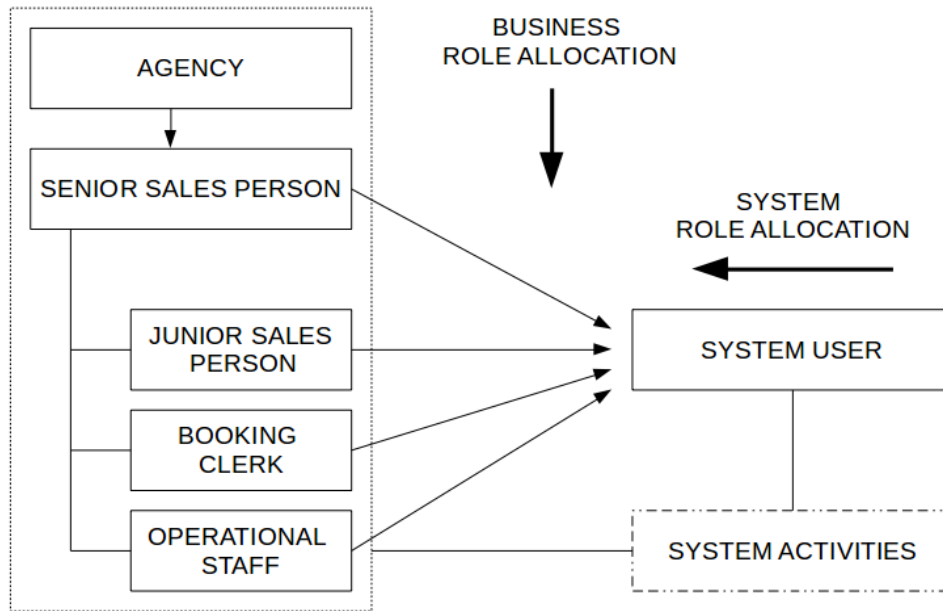
Figure 10.85: Market system role allocation
Source: Field notes

Table 10.12 summarises the different structures various users enact as part of their functions. As the roles and functions are prescribed by the central system, these structures are the same on all markets in South Africa. These are the functional structures embedded within the workflows on markets and hence the same structures are drawn on across the markets. The importance of this is that the predictability is high of any interaction with the market system. In many cases, users also know the functions of the other role-players and can form accurate predictions relating to their use of the system.

Summary notes:

- Enacted technology structures around the same system increase predictability and creates trust in the broader institution.

- Enacted structures are also influenced by the broader institutional norms and as such provides for shared norms relating to expected behaviour.

Table 10.12: Technologies-in-Practice enacted: Role-players

Technologies-in-practise	Market personnel function	Buyer function	Agent/Salesman function
Primary Actor	Market staff	Buyer	Agent/Salesman
Institutional Context	Market staff as part of the greater market facility.	Buyer acting on behalf of their respective businesses	Agent acting within the operational functions of managing the stock.
Motivation for action	Monitoring of compliance to set rules of trading. Enforcement of deviations to compliance.	Buying function needs to procure product. Requires information from the system regarding the aggregate price and quantity levels to make decisions.	Commercial motivation needs to sell product through the system. Requires information from the system regarding the aggregate price and quantity levels to make decisions.
Knowledge of technological artefact.	User level knowledge of the system.	User level knowledge of the system.	User level knowledge of the system.
Norms associated with the use of the technological artefact.	Norm of enforcing and monitoring activity.	Norm of opportunistic buying, trying to procure the lowest price.	Norm of opportunistic selling, trying to procure the highest price.
Action with respect to technological artefact.	Management services; Administration functions; Technical support functions: business users; Technical support functions: network and hardware; Inspection functions; Operational functions; Stock functions (amendments, destroy, transfer and cancel); Consignment control.	Deposit and withdraw monies; As part of the transaction provide buyer cards for authentication; Draw reports and statements from the system.	Registering delivery on system; Move products to specific storage areas; Do sales transactions on the system; Cancel, destroy and correct stock (with market authorisation); Generate stock related reports; Generate daily information for delivery to growers; Administrative payment process.
Features of technological artefact mobilised.	Standard menu options. Reporting functions. Various enquiry functions.	Standard menu options. Reporting functions. Various enquiry functions.	Standard menu options. Reporting functions. Various enquiry functions.

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10.4.9 Control points for external data sources

Relationships and networks formed outside the technology domain of the market also play an important role in characterising the internal relationships. This section introduces the various integration challenges outside of the market environment in order to show how the integrated nature of the channel is important to create an integrated solution. One cannot exclude from the conversation external sources, as they are part of creating the information pool, which is central to the functioning of self-service environments. According to Grimsdell (1996), the supply chain of fresh produce is generally fragmented posing challenges to an integrated approach to aspects such as data integration, an aspect central to the provision of assurance functions.

Product movements in the supply chain introduce changes to product quality and these in turn affect information feeding back that forms signals, on which the user base decisions. As the requirements are pushed up the supply chain, additional monitoring is required to ensure compliance and ultimately retain trust from both the end consumer and the relevant buyers.

Markets are part of a greater value chain. The off-line/online environments need to merge and one cannot exclude the physical interaction of products and various operational and logistical procedures. Assurances are created by the various third party assurance functions that are not necessarily integrated into market systems. Standards are a key aspect for providing pro-active measures to standardise expected results. Within the current market environment, this does not form part of the information flow. Figure 10.86 provides an overview of how the physical and electronic environments could be integrated. The key is the creation of control points (CPs) that generate information throughout the logistical chain. Without a strategy to ensure consistent data standards across the channel, integrating various nodes in the chain would be problematic.

The channel approach is important because the market functions in a broader supply chain competing with other channels. The effectiveness of the market is compared to other channels and a distinction needs to be made between the norms that govern the different supply chains. Markets are not standalone facilities; they are integrated into a value chain and are one of many avenues open to the grower, as the following quotes illustrate:

> "Developments in the fresh produce market are in full swing and simply supplying fresh products is no longer enough. Now more than ever there is a need for integrated supply chain management, due primarily to customer demand for supply security and stricter food

safety, efficiency and sustainability requirements." (Greenery, 2012:1)

"… the change is on the consumer side, the change that you see is because the buyer responds to his customer, so *the change is transferred from the end consumer backwards.* The consumer determines everything, the certification is marketed at the end consumer and this influences the chain backwards to the grower. This pushes down the chain, it stops at the pack house because they cannot push this down to the grower." [Interview Ref.: 1:4639]
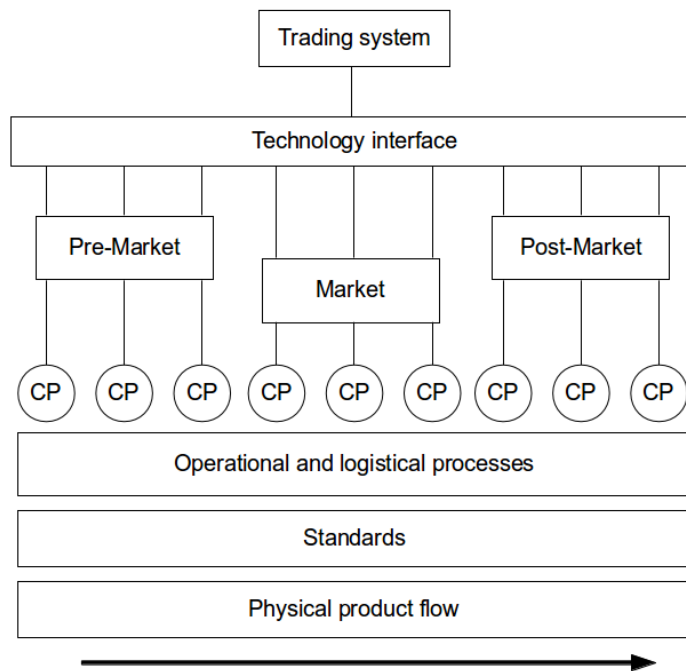
Figure 10.86: Conceptual illustration of an integrated control points (CP)

The experience with retail is that the standards are set by them in a hierarchical fashion and forced down to suppliers. The fragmented nature of the data files is an example of how each retailer uses its system as a power tool for compliance to their environments. Examples of these file layouts are provided below. An important variable within the broader industry is product quality, the ability to monitor, quantify and capture this as a system variable. Examples of the information generated at these various control points are described as follows:

"… if you have a pear that is not passed based on the grading process that happens and that grading process is not in the system, *it is only the results that are captured in the system,* as part of the make-up how much sugar etc. it is not captured. Yes it is passed for inspection and it can be exported". [Interview Ref.: 1:4979]

"… there are certain protocols that need to be recorded. In the orchard you can capture the spray program for instance related to that tree and how the ground was treated and who

actually picked, what date was it picked and that picked date also lives with that pear, if something goes wrong it can be traced back". [Interview Ref.: 1:5521]

"… the most significant aspect of the product is *the quality of the product and the issues relating to the quality and longevity,* a product that is poorly handled from the farm to the market and transported incorrectly has a serious impact on the market, the impact is on the producer and the buyer." [Interview Ref.: 1:4269]

"The role is huge, because we deal with fresh produce, the product from one day to the next day deteriorates, apart from that even if the product is fresh, the same pack house can pack today and be in a different orchard tomorrow and the whole thing will just be worst and the product will look good today and tomorrow not as good. It is a huge influence the physical product. You make price on the physical product on a day-to-day basis, by looking at the product, you can determine this is a good product or this is not a good product from years of knowledge. There are other contextual factors when you determine price. The most difficult thing to do is if a farmer or a buyer phones you and say here is a product and here is a picture of it. It is the most difficult thing to make price on that, you can perceive the quality or think the quality, but when it comes here it is not at all what it seemed like."
[Interview Ref.: 1:4389]

Apart from the relationship dimension, a *physical process* dimension, with various information points, exists that generates information to be incorporated into a solution. Trust in the service is closely linked to the product quality. Having a perishable product increases the risk for all participants and hence the over reliance on visual confirmations. The physicality of the underlying product affects the way the service is designed. Attributes such as quality, standards, packaging and shelf life of the product play a central role in the successful facilitation of the process. It cannot be ignored as these processes create vital signals that establish trust in the process and avoiding the need for physical verification from the end user. If the buyer, for instance, loses trust in the process, it removes the advantages of automation and hence using self-service. This aspect is closely linked to the levels of integration that are available between subsequent supply chain partners. Figure 10.86 indicates these multiple CPs (see also Figure 10.87). As part of the strategy, some of these points are integrated within the exchange to ensure effective signalling. If a buyer buys the product, regardless how trusting the relationship might be, once the product arrives and it cannot be sold or consumed, trust is destroyed. The challenge is to reach such a point where operational, logistical and data structures have to be integrated.

Figure 10.87 illustrates the potential challenges facing traceability amongst various independent supply chain partners. Apart from the internal processes, external third parties that are involved in the process also form part of the traceability framework. Figure 10.88 to Figure 10.91 shows the examples of various data files from retailers illustrating the fragmented nature of the supply chain when moving outside of the market environment.

Table 10.13 summarises the structural dynamics encountered when interacting with structures within the

supply chain. System ownership is a key source of power.
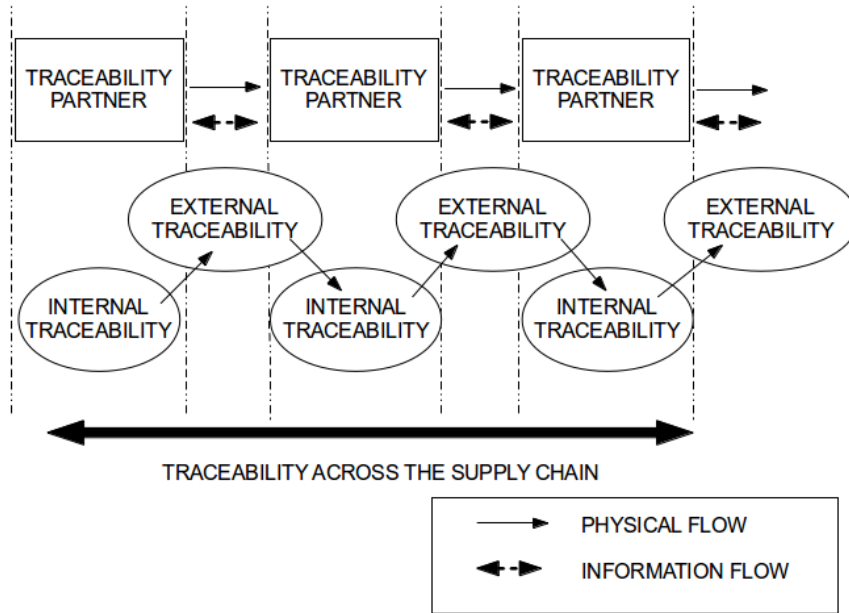
Figure 10.87: Traceability across the supply chain
Source: Adapted from GS1 (2010)

Table 10.13: Summary of structural dynamics: Integration

Description of relationship	Structure	Facilities	Comments
External supply chain partners / service providers / market management	Domination	Ownership of systems	Supply chain partners seek to enforce their own standards on fellow supply chain partners. Service provider not able to integrate a holistic solution.

Data file (Figure 10.88). Columns: PRODUCT DESCRIPTION, STORENAME, LINE COST, PRODUCT CODE / ITEM CODE, ORDERNO, DELIVERY DATE, QUANTITY, UNIT COST.

PRODUCT DESCRIPTION	STORENAME	LINE COST	PRODUCT CODE / ITEM CODE	ORDERNO	DELIVERY DATE	QUANTITY	UNIT COST
F/LINE PEARS GREEN	6 S		00000002999910082/16001008160636	47492	120628	144	2880.00
F/LINE TOMATOES LOOSE 15	KG		000000000000000/	10	90	90.00	
F/LINE PEARS BLUSH 6	S		00000002999810045/	30	144	1440.00	
F/PROD TOMATOES 1KG	1KG		000000000000000/	1	65	1950.00	
F/PROD GARLIC LOOSE 36	36 S		000000000000000/	1	360	360.00	
F/PROD FRUIT SNACK PACK	4 S		000000000000000/	2	90	90.00	
F/PROD TOMATO LOOSE 15KG	KG		000000000000000/	1	88	180.00	
F/PROD PEPPER GREEN LOOS	8KG		000000000000000/	1	280	88.00	
F/PROD PEPPER LOOSE RED	8KG		000000000000000/	10	30	280.00	
F/PROD TOMATOES S/GRADE	6KG		060009806060083/			300.00	
F/L PRICKLY PEARS	4 S		06001008642210/16001008642217	47492	120628	156	624.00
ZZ2 ROMANITA	500		06009605841517/	13	120	1560.00	
F/PROD PUMPKINS LOOSE	1 S		06001008687167/	4	100	400.00	
F/L APPLE SNACK/PK COMBO	1KG		000000000000000/	1	90	90.00	
F/L PINK LADY APPLES SOC	4 S		06001008696558/	1	161	161.00	
F/LINE TOMATOES L/LIFE 6	6PUN		000000029990542/16001008159937	47492	120628	65	3640.00
F/LINE TOMATOES L/LIFE 1	1KG		000000029990559/16001008159944	47492	120628	65	22100.00
F/L TOMATOES VALUE BAG	2KG		06001008659010/16001008659017	47492	120628	72	3096.00
F/L TOMATOES BAG	750GR		06001008659065/16001008659062	47492	120628	45	315.00

Figure 10.88: Data file Retailer A

VENDOR CODE	PO NUMBER	MSG ID	ORDER DATE	DELIVERY DATE	STORE CODE	STORE DESCRIPTION	PRODUCT CODE	BARCODE NUMBER	DESCRIPTION	PACK SIZE	QTY	PRICE (Inc VAT)	CURRENCY	PO TYPE
100034343	487957862	443232241	2015/01/04	2015/01/05	MA06	WC AIRPORT DC	0	6009605842422	VINE TOMATOES	12	8	480	ZAR	Allocation DC
100034343	487957862	443232241	2015/01/04	2015/01/05	MA06	WC AIRPORT DC	654403	6009605842439	TOMATO PP	10	2	200	ZAR	Allocation DC

Figure 10.89: Data file Retailer B

Product	Description	Supp Ref	Pack	Cost	Qty	Received
591	Tom Choice 4s Punnet x10		10.00	85.00	20	
397	Tom Choice 6s Punnet x14		14.00	147.00	30	
1910	Tom Choice Baby Plum 500g Punx10		10.00	115.00	10	
5415	Tomato Bacio Truss CockTail pp X5		5.00	22.50	20	
1624	Tomato Best Buy 1kg Poly x15 G/L		15.00	135.00	60	
4195	Tomato Best Buy Bulk 2kg x6		6.00	108.00	120	
252	Tomato Choice Baby Plum Punnet x10		10.00	60.00	20	
2776	Tomato Choice Poly x15 G/L		15.00	142.50	120	
255	Tomato p/kg x6kg Box		6.00	57.00	156	
398	Tomato Poly x15 G/L		15.00	142.50	160	
5416	Tomato Rigoletto Truss B/Plum pp x5		5.00	22.50	20	
1674	Tomato Romanita Poly x16 Box		16.00	152.00	220	

Figure 10.90: Data file Retailer C

PRODUCT DESCRIPTION	Code	Bags/Crates per pallet	Program	AVAILABLE	SUP. PRICE	Units per crate	FINAL PRICE	SAT
1kg Choice Bag (Lug x 15)	2776	45	682	1000	R 9.50		R 142.50	120
1kg Value Bag (Lug x 15)	398	45	313	1200	R 9.50		R 142.50	120
1kg Best Buy (Lugx15)	1624				R 9.00		R 135.00	30
Choice Selected 4's Punnet (Lug x 10)	591	45	58	90	R 8.50		R 85.00	20
Tomato Loose Sell (18 kg)	253	45	50	310	R -		R 0.00	
Tomato Loose Sell (14 kg)	395	45	185	230	R -		R 0.00	
2kg Tomato (*6)	4195	45	536	1000	R 18.00		R 108.00	120
3kg Tomato box without handle (Medium Smalls)	1347			0	R 24.00		R 24.00	
6kg ZZ2 box	255	156		R -	R 57.00			156

Figure 10.91: Data file Retailer D

10.4.10 Governance structures and its role

Giddens (1984) refers to institutions as collective "arrangements" governed by rules. These rules could include explicit rules or could consist of informal arrangements (Bachmann & Inkpen, 2011). Explicit rules provide the formal structures whereas implicit rules create a more context-specific:

> "... routines and practices of applying legal rules, teaching and learning styles, practices of financing investments, the use of industry associations' resources by their members, or the usual forms of treating vulnerable and not so vulnerable suppliers. Informal routines and practices represent, like formal rules, very important institutional arrangements, especially when they acquire stability over a longer period and attain legitimacy through common acknowledgement." (Bachmann & Inkpen, 2011:11)

According to Giddens (1990) trust is the confidence in the reliability of a person or system, given a set of outcomes and in the correctness of the abstract principles (technical knowledge). On an institutional level, trust is placed not only in the personal relationship but also within the broader institutional environment. In this manner, the collective perceptions of the various actors form a trust resource individuals draw from to perceive the trustworthiness of the particular institution. Trust plays more than a personal role to become a resource that structures the market through the power it allocates to its agent. Institutions represent a collective social view, confirming them as accepted and valid by the actors within the system (Giddens, 1984). Although the institutions are seen as large and not easily changed by day-to-day occurrences,

> "… both the power of institutional arrangements and the depth of the embeddedness of inter-organizational exchanges are crucial with regard to the predictability and trustworthiness of individual or collective actors who envisage or build a business relationship." (Bachmann & Inkpen, 2011:1)

Within the interviews a common understanding and interpretation exists of the role the market plays as an institution to ensure the credibility of the underlying transactions. The following section highlights the institutional nature of markets. The views that surround the role governance plays were quite strong from the various interviewees.

> "It does not matter what technology you provide, what information you give them if in *practice if you cannot deliver on the governance issue then you might as well not have a system.*" [Interview Ref.: 1:4917]

"In the free market system it only works well if it is defined with clear rules and regulations. You have to put the rules down for the free market system and then the market system must function and if it functions outside of the parameters then you have to act to address it and change the direction." [Interview Ref.: 1:125]

The view of the system is that it is structured to place the responsibility "in the right place":

"There is accountability, the *system place responsibilities on the right places*. There is responsibility verses trust. The grower holds the agent accountable for certain things *through the system*. Market *management uses the system*, they pull certain information and they *hold people accountable*. It is also traceable down to the lowest level of detail. *The ability to trace back assists accountability*." [Interview Ref.: 1:5744]

Creating trustworthy institutional relationships is dependent on the ability of the institution to embed credible and predictable perceptions about its use consistently. This is to be separated from the product/trading related risk that accompanies daily commercial activity.

"Optimal trust exists when one creates (and maintains) prudent economic relationships biased by a willingness to trust. That is, agents need to *have stable and ongoing commitments to trust so that they share affect-based belief in moral character sufficient to make a leap of faith*, but they should also exercise care in determining whom to trust, to what extent and in what capacity. Optimal trust is an embedded construct, suggesting that it is determined in context and shaped by a variety of factors, such as the trustworthiness of the agent, local and broader social norms regarding trust and other features of the relevant social structure(s)." (Wicks *et al.*, 1999:103, *own emphasis*)

The market is a supply and demand driven business where price discovery is seen as one of its core functions. But for an institution to be in a position to have a price discovery mechanism, as is the case in South Africa, the underlying institutional structures need to be in place. The governance framework on markets (Chapter 8) provides a low risk, low cost environment to which growers deliver their produce. Especially on the major markets (Johannesburg, Pretoria, Durban and Cape Town), these dynamics drive the prices through the combination of supply and demand and the competition between agents to achieve the highest price, move the most product and delivers the best service to their growers.

The agents are constantly trying to procure produce from a competing agent's grower promising better service and assurances around market related pricing (not just the highest but also the *right* price). Because the revenue model is purely commission based, the agent's only way of increasing his income is through increased sales value. Revenue is of course linked to price, so in certain times with high prices, the agent

actually tries not to procure too much produce to maximise revenues (keeping supply low). Due to the competitive environment on markets, this situation is not sustainable and short term monopolistic or opportunistic activity is quickly countered by peers. This is the nature of the competitive *engine* on fresh produce markets.

Of course, these competitive dynamics do not self-regulate and function optimally without a very strong governance framework. The measures that produce trust in institutional arrangements are (Bachman & Inkpen, 2011):

- Legal regulations target antecedents of relationship;

- Certification targets antecedents of relationship – professional codes of conduct that are or are not legally binding;

- Standards of contractual nature;

- Corporate reputation – practices of interaction;

- Community norms, structures and procedures – targets practices of interaction. Formal and informal norms of behaviour. Institutions sometimes convey norms of behaviour that are deeply rooted in ancient traditions.

Not all of these can be provided by a market authority, but the cooperation between various regulatory bodies assists in creating a broader regulatory net. Institutional embeddedness, temporal and social embeddedness form what Riegelsberger *et al.* (2005) calls contextual properties. This broader institutional embeddedness of the various rules is what McKnight and Chervany (2002) refer to as situational normality for which we have to strive.

Menard (2004) makes the following important observation:

> "At one end of the spectrum, the closest to market arrangements, are hybrid forms relying primarily on trust. In these hybrids, decisions are decentralized and loose coordination is implemented through mutual influence and reciprocity. From a calculative perspective, trust can maintain cohesion and guarantee some coordination because it is rooted in the need to maintain continuity in the relationship. We are not talking about a purely informal relationship here. Trust can operate as a (weak) form of government because it is based on specific arrangements and performed by specific actors." (Menard, 2004:367)

Trust become an embedded institutional structure. The set of regulatory structures is designed firstly to regulate the principal-agent nature of the relationship between the grower and its agent. Secondly, through the by-laws, allocate almost draconian power to the market authorities and their management. Thirdly, a legislative framework (Act 12 discussed in Chapter 8) further compliments the oversight over agent's activities and lastly the more informal norms of industry related training and best practices are aimed at countering the potential for opportunism.

Within this context, the computer system in use on the markets becomes a pivot around which the stakeholders are all linked (See Chapter 9).

From both a relational and technological point of view, trust has to be established over time on markets. Although users trust the market, this does not mean they trust the technology itself sufficiently to abandon traditional methods of trading. Time and the growth of trust over time is a key factor in the building of these relationships (Mayer *et al.,* 1995, Bhattacharya, 1998).

Continuing the theme of a collective eco-system, perceptions of the institution and its trust structures are formed through broader contextual perceptions relating to the existence of regulatory structures and strength/weakness of the market authority to enforce these norms. Simply focussing on the relationship between the grower and the agent is not sufficient to build trust structures on markets. Market management plays an important role in establishing the market as a preferred channel over and above the relationship between the transacting parties. The level of objective and impartial oversight strengthens the grower's perception of the market. Institutional structures form a complimentary layer to the primary relational trust between participants. The rules and norms are not just shaped on the market itself but are directly influenced by a broader national legislative framework. These additional structures are enforced by third parties not on the market per se. Trusted third parties (Riegelsberger *et al.,* 2005) contribute to institutional trust building and the market is a good example of this. Standard authorities such as Prokon, PPECB are all mandated participants in the trade process but are not directly involved with the sales transaction.

Monitoring of activities is part of the functioning of the governance structures:

> "We have processes in place, we do internal audits, APAC does independent audits. Because there is not only one stakeholder, there are checks and balances. We monitor agent, buyer, grower activity and access to the system. About 30% is manual and the rest electronic." [Interview Ref.: 1:4587]

> "The system is a tool to affect change very much so; the steps we do take are proactive.

We monitor their behaviour, using both automated and people. We have reports that are manually checked, we have automated systems take certain actions when flags are raised. Biggest challenge for us, generally payment needs to be made first before product is shipped. We only know that something has gone wrong after some time after the payment is made and the buyer now becomes suspicious. That is a reactive process and a challenge to us." [Interview Ref.: 1:5871]

Pro-active monitoring is both an automated and a manual reporting process. The system is used as a resource to monitor activity but not all monitoring is effective. Although the management is not party to the transaction, they are a critical component in maintaining the structures that support the trading activities.

"… does the producer feel safe and there I want to refer to Hoopstad mark, in Pietermaritzburg; we closed them in 2009 because of R2.5 mil trust shortages at one agent, after we closed them less producers sent there, *my perception is that producers felt unsafe, they felt that the market had a greater responsibility to detect it earlier*, the same thing happened in East London a year later when we closed an agent there. The role of the market is to be a landlord, second is administrative, thirdly is a regulating function they perform, within that context that is the role the market has to perform. For a producer to feel safe to send, the market as regulator is going to look after my product, as landlord he will make sure the cold rooms are maintained." [Interview Ref.: 1:4798]

To create institutional trust structures within self-service exchanges, the activities of the various users need to be monitored on a continuous basis for opportunistic behaviour. Trust in the agent also implies trust in the market structures that has to perform these policing functions.

The monitoring of activity is also a collective function where the system allows for the sanctioning (positive and negative) of actions. These collective peer review mechanisms allow for additional signals that users employ to evaluate past actions and form expectations about future actions.

"So we found *that the rating system, the feedback system is crucial* if they want to purchase from the site and vice versa looking from the buyer side; are they trustworthy are they going to make payment on time. That goes to *our feedback system;* we monitor things like how many negative ratings the buyers and sellers are getting." [Interview Ref.: 1:4592]

"We offer a *rating system* where we use and get feedback from the experiences from the other users, we also have a buyer protection program where we which covers to a maximum of R7 500 in the event that the seller does something fraudulently. Those are the sort of elements that we have introduced that you do not get on online classified-sites; the risk is a lot higher and the trust factor is a lot more important if you *have nothing to base the relationship on.* This sets us apart from the other online market places." [Interview Ref.: 1:5849]

Dewally and Ederington's (2002) research focused on the online auctioning of comic books on eBay (1 398 unique sellers), which holds high levels of opportunity to act opportunistically and high levels of asymmetrical information. They found that certification-linked products sold first for a significant premium (50%) and directly contributes to the reputation of the seller. The reputation of the third party is one of the most important methods to create confidence in online environments (Pavlou, 2003). It has been shown by McKnight *et al.* (2002) that trusted third parties can greatly assist in building trustworthiness. Not only online information, but also off-line information is used to form trusting beliefs (Salo & Karjaluoto, 2007) as trust and communication are correlated (Jarvenpaa *et al.,* 1998). Deliberate dialogue with users and pro-active communication strengthen the users' trust. Explicit pro-active communication and sharing of information is also a method for showing benevolence. This loss of information is often considered to increase uncertainty and to result in lower trust (e.g. Shneiderman, 2000). Information forms an important source of trust signals required to establish the potential of trustees to perform as expected Schniter *et al.* (2012):

> "Signals encouraging trust appear to be important tools for developing mutually beneficial relationships under conditions where trust has not yet been established and where trust has been damaged." (Schniter *et al.*, 2012:2)

Examples of opportunistic behaviours are multiple, but in a trading environment, these might include unauthorised collecting and using of customer information, unfair price discrimination and misrepresentation of products.

> "Trustees who do not act under the influence of trust-warranting properties will aim to emit signals of the presence of these properties in order to persuade trustors to engage in trusting action to then refuse fulfilment. Burglars may wear couriers' uniforms, people may look you in the eyes when they lie to you and an 'on-line bank' may be hosted from a teenager's bedroom." (Riegelsberger *et al.,* 2005:391)

Table 10.14: Example of contextual influence
Source: Riegelsberger et al. (2005)

In this example, we take the local branch of a bank and we assume that the branch manager is approached for a loan by one of the residents. The manager has a good idea of the intrinsic properties of the client, as well as the contextual elements. Faced with a decision to provide the loan, the manager has the ability to have signals available over and above the framework that needs to be followed to provide the loan as set out by the bank. From the customer's side, there are multiple elements available to the customer to determine the credibility of the bank, in the same manner as the bank manager has. Now if this is removed and the customer needs to consult a self-service system, only the

qualitative measure is available to determine creditworthiness. In addition, if the customer has no history this is even worse. The customer only interacts with the interface to determine what the bank offers. The broader institutional assurance needs to be drawn from media, advertising, etc. The only contextual property is the institutional embeddedness. Intrinsic measures are also not available as would be in a call centre, to be at least sure that a big organisation would screen their personnel and would have the measures in place to protect the customer.

The risk of non-fulfilment might affect future exchanges. Initial investments in a relationship create incentives for trustworthy behaviour. Riegelsberger *et al.* (2005) do not term somebody as being trustworthy if they are coerced by contextual properties. Shared membership and geographical location are also aspects that could induce future transactions.

> "… shadow of the future: stable identities and information about the likelihood of future encounters (e.g. shared group membership, investment in initial transactions) are the key design implementations to enable this contextual trust-warranting property." (Riegelsberger *et al.,* 2005:394)

Critical receivers can incur lower costs than naïve receivers do (Maynard-Smith, 1982), hence natural selection favours those receivers who can accurately assess the cost–benefit trade-offs associated with emitters' signals and calibrate their trustfulness accordingly.

> "… high production cost of a signal guarantees its reliability, insofar as the production cost outweighs the benefits gained from using the signal deceptively, but not from using it honestly. The prototypical example is the massive and colourful peacock's tail, indexing the peacock's genetic quality for peahens' mate selection." (Schniter *et al.,* 2012:3)

Consider the cost of signals and how cheap signals versus expensive signals. Porter (1985) proposes that barriers to entry and exit require high investments and this in turn could be a sign of trustworthiness. If the opportunity cost of not participating in a trust-based exchange is large, participants will tolerate false signals (Schniter *et al.,* 2012). Although signals that accurately convey behavioural propensities are potentially useful to both senders and receivers, signallers may send "dishonest signals" to benefit at the expense of receivers.

> "For some product markets that are considered inherently of low involvement overall, high expertise may signal high involvement processing on the part of some consumers: in this

case, product-market expertise could be a moderator of model relationships." (Chiou, 2006:624)

Signals play a very important role in the trust process and can be socially related or institutionally embedded. The challenges faced are how to facilitate these signals through electronic means.

Table 10.15 describes the relationship between these parties using a matrix. The trusting party trust the trusted party to perform certain functions. This integrated network of cross-functional relationships characterises the various activities on markets. Trust relationships were painted to be a one-way relationship, that of the grower having to trust the market as an institution. However, reverse assurances are also required. These does relate to product quality that has been discussed earlier, but also to the performance of the grower to deliver on a continuous basis. The matrix illustrates the boundaries that are set to distribute risk between the institution and transacting parties. This shared risk and oversight concentrated within a controlled environment provides the elements for institutional trust perceptions.

Table 10.15: Trusting and trusted party relationship matrix

Trusted Party / Trusting Party	Grower to perform	Agent to perform	Buyer to perform	Market Authority to perform	External Regulator to perform
Grower trusts		Sales service (governed by regulations)	Indirect / limited relationship via the agent	Enforcement, arbitration, infrastructure, information provision	Enforcement and arbitration
Agent trusts	Product quality and continuity		Transactional Integrity	Enforcement, arbitration, infrastructure, information provision	Enforcement and arbitration
Buyer trusts	Product quality and continuity	Sales service		Enforcement, arbitration, infrastructure, information provision	Indirect / limited relationship
Market Authority trusts	Product quality and continuity	Procurement and sale of produce	Transactional integrity		Enforcement and arbitration of trust account
External Regulator	Regulator acts on	Sales service	Limited	Primary contract enforcement,	

trusts	grower's behalf	(governed by regulations)	interaction	monitoring and arbitration	

Summary notes:

- Routine interaction with institutions should include the elements as listed by Bachmann and Inkpen (2011).

- Third parties play an important role to assist trust formation in institutions. These third parties are not necessarily on the market itself, but are part of the broader supply chain.

- Opportunity cost of not adhering to group norms should be high. This in turn also signals trust as it shows an investment into the specific role by the trusted party.

- Predictability emerges as an indicator of lower risk to the trusting party. The distinction needs to be made between predictability of the control structures and predictability between the individuals in the transactional environment.

- Trust between the various actors should not be viewed as a one-way relationship, grower having to trust the institution, but the institution also has to form trust perceptions about the grower and the buyer. A network of relationships exists that characterises trust relationships within markets. These can be viewed as embedded structures.

Table 10.16: Summary of structural dynamics: Governance

Description of relationship	Structure	Facilities	Comments
Market management's role in monitoring governance.	Legitimation	Norms of compliance. System allows for routine enforcement of norms.	System is a resource to allow the market management to monitor and enforce compliance.
Market management's role in monitoring governance.	Domination	Market system ownership and control.	System allows for the monitoring of the activity, which in turn gives the management a resource to enforce compliance deviations pro-actively.

10.4.11 Self-service and its potential role

Self-service is not a reality within the industry although the need for more direct access to electronic facilities is expressed by the interviewees. The motivations range from higher levels of traceability, to better control and strategic purposes.

"… self-service technology can assist the trust relationship; there are conditions, it has to work and it needs to be *easier and it must provide an advantage for the buyer*. It must provide an advantage for the buyer, it must give them a competitive edge." [Interview Ref.: 1:4571]

"Five years ago they were very sceptical, time and effort was made to create a cashless environment. It was a very difficult process to tell them that they can deposit money into the bank and the amount is reflected on the buyer card of the market. We had to take group of small buyers, we had to show them the process from the payment to the buyer card. They are now before 06:00 at the cashiers where in the past they could only start buying at 07:00." [Interview Ref.: 1:5767]

"And that within a fruit industry context? I am a supporter of the use of technology and I am a supporter of trusting each other, but I do not think that your typical role-player inside the South African fruit industry is ready to embrace this type of technology. *The industry functions on relationships and networks".* [Interview Ref.: 1:5166]

The above quotes also reflect the deep embedded role social relationships play within this channel. From a technological point of view the implementation and use of electronic methods to perform services is not the challenge; the social relationships that characterise the various interactions are. Our understanding of these relationships is paramount to implementing sustainable technology driven solutions.

Is there a need for self-service in the industry, can it contribute to the effectiveness of markets? There seems to be a need for greater transparency and the introduction of self-service and the provisioning of control that is more directed at stakeholders not part of the transactional environment (buyer and grower). Self-service is seen as an enabler for both the creation of trust and for the strengthening of the business model. Providing control is an enabler not only to build trust but also to correct any asymmetries in the relationships. Positioning users closer to the "coal face" and allowing the direct interaction with all aspects relating to affected transactions, but also to the broader institutional signalling seems to be a method for enhancing trust:

"… people must know that it holds a benefit to them to use it. Firstly, you have to understand the advantage. That you are in control of the process, for some people that counts. Secondly, you have to market it." [Interview Ref.: 1:6008]

"We find that many of the users prefer to use our payment system because they know they that they have got an element of control over the funds should it be required." [Interview Ref.: 1:965]

"Involvement, giving people access, to intrinsically what is their business, when a product gets sold on the market it is the business of the farmer, it is the business of the buyer. Once you start allowing them to come closer to the *coalface, closeness, involvement* and you actually start improving their ability to influence the process and they are no longer just an

outsider to the process, *they move from an outsider to an insider, they no longer reactive, they can actually be involved and pro-active.* I think that transition if we can get that right, will make a serious difference in the way the producers view the market, I actually think it can turn around support for the market. Ownership, from the producer's perspective, for the process, once he becomes involved he take ownership. From this, other needs will flow; other issues will come from this. This is a process, a beginning of a process. It is opening a realm of possibilities that we are not even aware at this moment. Control...if you are able to be at the coal face and you can see what is happening, it also gives you more control over the process, at the coal face, you can come in and you can see what is happening with your product, you can immediately intervene it gives you a level of control you never had before. And to me that is the way through technology we can bring the producer closer to the market and the buyer and we can have a solution that is far more attractive than what we had in the past. And when you look at these things that I have just told you, surely you can see the real transparency coming through versus what we had before." [Interview Ref.: 1:4267]

"I think you sit with the problem that not all growers are not technologically orientated. They are moving gradually, most have a cell phone, so there is a starting point. If I look at our website, if I look at our Facebook, we struggle with producers in that manner, if I look at our electronic newsletter; it is almost like it is the wrong medium. I think the cell phone as a starting point. It [self-service] will give more trust, because I can still discover that agent still writes the faxes by hand, the transparency can be 104%, we say it is transparent you can go and look on the system, but we can see it the *growers cannot see* it, as markets *we are light years behind* the gap is great, because the grower cannot see what is going on, I think the trust can be enhanced. An investigation that I am busy with, the transaction is reserved then it is booked than it gets cancelled, then it gets reserved again then nothing happens. The producer *does not see that transparency*, that transparency is missing, if the grower *really saw what is going* on it could enhance trust and if he realises that the whole transaction trend is where she booked it with her sister because she has a wholesale business, then something was not right and eventually the price that was booked is R2.50 below the original. That transparency we have not achieved, that we are all familiar with is what creates the industry gossip. If we can pinpoint it, we can go and investigate. There is a gap for technology, but for a limited amount of PCs, cell phones should be the starting point for growers." [Interview Ref.: 1:5944]

Providing control to the user strengthens the sense of certainty the user attributes to a potential positive outcome. Deliberately providing control to the user strengthens trust in the process. Users are able to control the pace of the transaction, level of desired interactivity and ultimately the outcome of the service (Collier & Sherrell, 2010). The fact that users experience functionality within other contexts also eases the burden on introducing those functionalities within the market environment:

"As more people used electronic banking and saw technology being used around them, the more they had trust in the concept. Benefits also forced the use; quicker time of wrapping up sales meant people eventually were willing to take a chance. In addition, cell phones helped to push technology adoption of technology. Big buyers are business people that are

using technology and this influenced the eventual adoption rate. Smaller buyers are not so exposed to technology so demographics did play a role". [Interview Ref.: 1:5664]

As people enact technology structures in other industries, those experiences are transferred to the market environment and assist the introduction of this into market environments. Collier and Sherrell (2010) highlights the paradox within self-service that convenience is actually understood to mean that the customer does as little as possible. However, the reality is that the customer in this context ends up controlling and performing all the tasks, with a well performing SST the service is more convenient if people do it themselves.

> "Perceived control from a self-service perspective is defined as a belief in one's ability to command and exert power over the process and outcome of a self-service encounter. With self-service technology, perceived control refers to the ability to dictate the pace of the transaction, the nature of the information flow and the level of interactivity." (Collier & Sherrell, 2010: 492)

Lack of control (Dabholkar, Bobbitt & Lee, 2003) discourages usage. Levels of control have been shown to be correlated to physical and mental well-being (Skinner, 1996). Collier and Sherrell (2010) indicate that perceived control and perceive convenience both affect intentions of customers to use SST, mediated by speed of transaction, exploration and trust. Meuter *et al.* (2000) indicates that a number of benefits to the user can be related back to levels of personal control (to be able to interact at will for example). Averill (1973) distinguishes between three main types of control that characterise personal control: behavioural control (direct influence on the environment), cognitive control (reducing uncertainty and imposing meaning) and decisional control (having a choice amongst different options). Personal control is composed of predictability, controllability and outcome desirability (Lee & Allaway, 2002). Lee and Allaway (2002) draw a relationship between personal control and perceived risk (See Figure 10.92). The relationship between risk and trust has been discussed within Chapter 5. Table 10.17 summarises structural issues relating to aspects like control.

Summary notes:

- The deep-rooted social nature of the relationships and networks within the industry affect the approach to self-service. These social dynamics overshadow the potential use of technology interfaces.

- Allocating control to the user and empowering the user strengthens perceived trust in the service

through the more predictable nature of the expected outcome.

- Enacted technology structures can be seen as transferable between various institutions. This allows for trust in the technology itself to be transferred to other institutions. But trust still needs to be established in the institution itself.
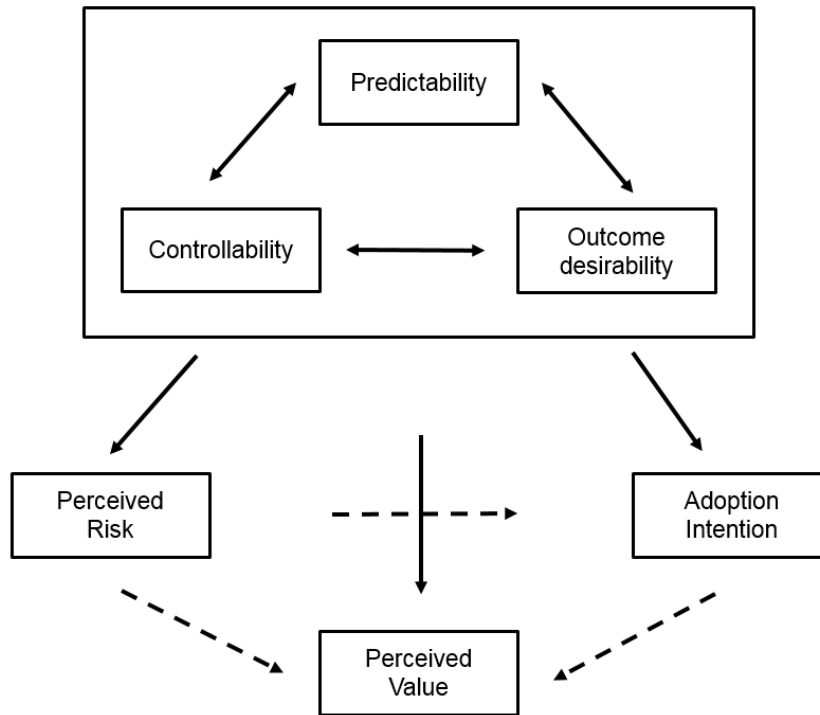
Figure 10.92: Effects of personal control on self-service technology innovations
Source: Lee and Allaway (2002:556)

Table 10.17: Summary of structural dynamics: Self-service

Description of relationship	Structure	Facilities	Comments
Stakeholder's level of interaction (currently excluded).	Domination	Use and access to system on a real time basis.	Access to the system by currently excluded stakeholders will assist the neutralisation of information asymmetries.

10.5 Concluding summary

This chapter presents the data generated by the various interviews and the discussions surrounding the various themes that emerged. In order to look at trust within this institution one has to look at the various formative properties of institutional rules and practices combining to create such a trust environment. The principal-agent relationship that exist between the grower and the agents and the grower and the market, is complimented and one could argue strengthened by the specific business model of commission selling. Ownership of the computer facility directly affects the ability to influence structures of domination. Technology plays a primary role as facilitator of the various structuring activities of all actors within the market as well as on the outside. The system itself becomes a tool and should be approached as a facility through which participants exercise power and control. Trust structures are established and maintained on a personal as well as institutional level.

The following chapter builds on the various themes that emerged from this chapter as part of the construction of the conceptual framework.

Part 3: Case Environment

CHAPTER 11: CONCEPTUAL FRAMEWORK

CHAPTER ROADMAP

PART 1 - INTRODUCTION

Chapter 1	Introduction
Chapter 2	Research Methodology

PART 2 – LITERATURE REVIEW

Chapter 3	Approach to the Literature Review
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PART 3 – CASE ENVIRONMENT

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CHAPTER 11: CONCEPTUAL FRAMEWORK

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"We should understand human societies to be like buildings that are at every

moment being reconstructed by the very bricks that compose them."

(Giddens as quoted by Mendoza, 1997:271)

11.1 Introduction

This chapter draws on the discussions in the previous chapters to develop a conceptual framework supporting the enhancement of trust in self-service solutions. In the preceding chapters the structure of wholesale markets emerges as a complex system of inter-related social, product and technical drivers (See Chapters 7 and 8). Chapter 10 introduces additional themes from the case environment that describes this complex interaction between the institution, its commercial and social mandate as well as the individualistic actions of the various actors. The empirical data also highlights the role that a physical product plays as part of the relationship. Regardless of the levels of trust that are institutionalized, the inability to facilitate the unique characteristics of a product as part of the service, especially of a highly perishable nature, introduces additional challenges for the provision of self-service. The discussion in chapter 9 around perishability, indicate that even in a hierarchical organization (like Amazon), perishability challenges our understanding of facilitating service provision through electronic means. Chapter 10 illustrates the effect of a high level of institutional trust on the various enacted structures, both on a social and on a technology level. In combination, these enacted structures show a similarity between the various actors and in turn provides both structural assurance and situational normality resulting in high levels of trust in the institution. From the literature, we see that system trust is characterised by the interpretation of broader contextual aspects (situational normality and structural assurance) in addition to personal trust dynamics. Actors were shown to be willing to take part in an institution even being subjected to high levels of centralized control dominating their activity. The need to introduce additional assurances around the physical product, through either personal or third party structures, challenges the effectiveness of the market and its computer infrastructure to facilitate all aspects related to the procurement and sales of fresh produce. Self-service in this context not only facilitates the transactional component, but also needs to incorporate aspects around the physicality of the underlying product. Traditional views on self-service technology do not give prominence to this important element. Providing the technological solution for such an environment, especially with the aim of reducing physical interaction, is not only challenging on its own, but also it is also crucial to the effective functioning of such an institution to provide services via electronic platforms. The following sections discuss aspects around the conceptual framework and conclude with an overview of the use of a structuration approach.

11.2 Approach to the conceptual framework

The aim of this study is to develop a conceptual framework that assists us in better understanding the linkages between self-service and the broader institutional environment and how this could be exploited in order to build and sustain trust.

> "A theoretical framework is a conceptual model for how one theorizes or makes logical sense of the relationships among the several factors that have been identified as important to the [research] problem." (Sekaran, 2003:87)

The development of theory in this case the conceptual framework, is a non-linear process. The process of developing the conceptual framework is characterised by continuous engagement with the empirical and literature components of the study. The fieldwork provides a rich set of data from which valuable conclusions can be drawn, firstly related to the trust dynamics on markets and secondly of the deeper underlying concepts that drive behaviour of actors. Themes that emerge from the fieldwork have to be continuously compared to the scope and aim of the study and hence a level of subjectivity is present in the selection and interpretation of both data and literature (See chapter 2).

> "The theory-building process occurs via recursive cycling among the case data, emerging theory and later, extant literature. Although sometimes seen as "subjective," well-done theory building from cases is surprisingly "objective," because its close adherence to the data keeps researchers "honest." The data provide the discipline that mathematics does in formal analytic modelling." (Eisenhardt & Graebner, 2007:25)

Building trust in institutions involves a social approach towards the design and implementation of technology as social aspects ultimately play a key role in structuring of trust within institutions (Chu & Smithson, 2007). Actors interact with a broader institutions and trust relationships are formed in a similar manner than personal trust relationships (Currall & Inkpen 2006). Although institutional trust can replace personal connection to some extent, trust is always influenced in some way by individual trust dynamics (Riegelsberger *et al.,* 2005). But trust formation is not just informed by trust signals shared between individuals; a multitude of institutional trust signals informs the actions of actors in a recursive manner. How to structure these environments to explicitly communicate and build trust formation into the interaction between actor and artefact forms the core of the conceptual framework. The following section provides an overview of the empirical findings.

11.3 Overview of empirical findings

A key aspect that seems to be shared by all in the interviews is the importance of the computer system as an information distributor and tool of monitoring and enforcement.

> "… the markets cannot function without a computer system, *it is impossible*." [Interview Ref.: 1:4964]

Approaching the challenges faced in implementing self-service within the industry can very easily be reduced to a technology only discussion. But the facilitation of trust through self-service needs to include multi-dimensional attributes such as governance, service types and ownership structures to provide the correct context (Canavari *et al.,* 2010). Although the relationship at a high level seems to be shaped by inter-personal trust, the underlying role the institutional dynamics plays in trust formation quickly becomes apparent when one unpacks the dynamics shaping the operational environment of the market. At the most basic level self-service needs to solve the user/customer's problem (Dixon, Freeman & Toman, 2010) and service their needs (Frei, 2008). Although the delivery of services have evolved from human facilitated services to anytime, anywhere delivery (Fitzsimmons, 2003), the realities of physical product provision as part of service delivery needs to be recognized.

Trust in *expert systems* (Giddens, 1990), systems like the market environment where a collective of highly skilled actors provide a highly specialised service, draws on the *correctness of the principles* in addition to aspects such as the ability, integrity and benevolence of actors as part of trust formation. Through routine interaction, actors seem to build a map (structure) of the level of predictability of these structures to act in accordance to expectations. Over time these perceptions becomes embedded and institutionalised as constitutive conditions of behaviour (Bachmann & Inkpen, 2011). Enforcement and development of contractual relations are enhanced if buyers and sellers have relationships that are socially embedded (Schultze, 2002). The case environment reflects the structuring role established relationships have on the facilitation and enforcement of contractual relationships. An argument could be made for a view that trust should be seen in a similar light as facilities/norms from which actors draw and should be incorporated explicitly into a structuration context; this is perhaps a topic for another study. Trust seems to become a resource of power once embedded within the social fabric of the institution.

A powerful relationship emerges between the level of ownership and use of the system as a resource and the ability of market management to perform their functions. Ownership allows for the control over

information, transparency levels and the objective enforcement of institutional norms. Ownership is closely tied to access and control over resources to affect structures of domination and ultimately to allow credible signals to emanate from these structures. The market authority plays a crucial role in providing the environment conducive to trust creation. The system is described as a *tool*, a resource used deliberately to shape the functioning of the markets and behaviour of its users. Market managers had similar views on how to use the market system as a tool to correct what they perceived as unfairness in the trading environment. Similar views were raised by actors describing the positive role the system performs. This seemingly mature approach to the system's function in the market can only be achieved through the shared view of the effectiveness and legitimacy of the broader institution's function being of benefit to all the participants. Added to this shared enactment of similar structures is the underlying role trust plays in structuring the various actors drawing on the same system motivated by contrasting mandates for their action. These embedded views of the broader institution provide structured assurance from a social perspective.

Each one of the various role-players has a distinct service agenda that frames their activities within the system. From a market management perspective the services that are provided is aligned with the mandate given by the institutional layer. From an agent perspective the mandate of selling produce places the agent in conflict with the governance structure as these businesses are restricted from acting opportunistically. Through the careful role allocation and the ability of the system to set boundaries to these roles, the actions of actors are framed (and contained) within particular functionality. This introduces collective perceptions of predictability relating to the various functions. Services that are embedded and institutionalised enact similar technology structures in users. Observing similar actions of other users within the system provide situational normality, which enhances trust. These are processed as part of the input signals for the creation of trust perceptions regardless of the type of institution. Although the extreme definition of self-service is 100% facilitation (absolutely no human contact), the reality is that a physical component is present as far as the product/service is concerned. This physicality needs additional assurances if there were to be no physical interaction through a technology layer. The information-based approach is captured in the well-known phrase "trust but verify", which reflects trusting exchange partners' attempts to address the vulnerabilities inherent in trust by producing relevant information (Gundlach & Cannon, 2010). To extend assurance the framework includes the role of third parties and data integration up and down the supply chain.

In exchange for using such a restricted environment, the actor also enjoys the benefits of a structurally predictive context. This aspect removes the potential conflict between the individual and the system in environments like the market where they are forced to use the system. The ability of actors to compare system expectations and norms to that of others contributes to their trust placed in the system. The interaction *with* the technology interface becomes less of a focal point than the interaction *through* the technology interface with the broader trading environment. The net result is an inherently predictive environment, from a system as well from a social perspective.

Information plays a critical role in providing transparency. However, as was shown in the interviews the provision of transparency is not only dependent on the ability of the system to capture relevant information. There are numerous challenges that the collation and distribution of information faces.

> "Reluctance to provide personal health information could impede the success of web-based healthcare services. … individuals' intention to disclose such information depends on their trust, privacy concern and information sensitivity, which are determined by personal dispositions—personality traits, information sensitivity, health status, prior privacy invasions, risk beliefs and experience— citing as intrinsic antecedents of trust." (Bansal, Zahedi & Gefen, 2010)

Firstly, there is the fact that information used within the system consists of more than just quantifiable information. A large amount of tacit information is used by participants to contextualize decisions and actions. Secondly, information sources are not always available from which to extract information. This was illustrated by the challenges that the export channel faces in integrating even the most basic information flows to publish aggregated statistics. Even with access, the lack of permission to use the information for the collective benefit causes the information to lose its value. A third aspect is the link between a physical product and the ability to draw information into the system that represents critical attributes associated with the perishable nature of the product.

Service systems ultimately requires co-production (Spohrer, Maglio, Bailey & Gruhl, 2007). Allowing the user to control their process is inherently part of the technology layer. Services need to be initiated and through using self-service, users become part of service provision. This also allocates a level of control to the user. Providing high levels of control positively affects trust perceptions (Campbell *et al.*, 2011). As Spohrer and Maglio (2008) state, entities in a service systems lies along a continuum from completely self-sufficient to highly specialised production-consumption requirements.

Market systems are characterised by clear role allocations. Role allocations and boundary setting ensure that all parties are familiar with their own functions but also that of others. A clear distinction between the roles is important to avoid potential conflict of interest for example, in the case of the grower and salesman relationship. Roles also introduce predictability, which reduces perceived risk. Role allocation refers to the ability of the system to separate various roles on the system. For example, buyers, agents and growers are clearly defined and act within a pre-determined set of functionality. In the same manner, the agent functions within a set of rules and procedures. The roles have clearly set boundaries. These boundaries are supported by the regulatory powers, both internal and external to the system. Market authority enforces these roles through monitoring and sanction of actions. An important aspect highlighted by Campbell *et al.* (2011) is that the service relationship between the customer and service provider is constantly moving boundaries as increased competition, changing attitudes and technology impacts on the service environment. This is part of the normal dynamics within service delivery and value adding. Shifting of service boundaries does not mean the governance boundaries also shift. The rules that define the roles of the participants prohibit the changes in these boundaries. For example, the rules governing the agents explicitly prohibit them from getting involved in any activity that involves taking ownership directly or indirectly of the product. So the service of the agent is framed by the system rules. In the same manner, a buyer cannot also be a supplier.

11.4 Conceptual framework

We are reminded by Giddens that our attempts to capture the complexity of systems are inherently incomplete:

> "No matter how well a system is designed and no matter how efficient its operators, the consequences of its introduction and functioning, in the contexts of other systems and of human activity in general, cannot be wholly predicted. One reason for this is the complexity of systems and actions that make up world society ... Even though we ourselves produce and reproduce it in our own actions, we cannot control social life completely." (Giddens, 1990:V)

The conceptual framework consists out of three layers. Firstly, *the institutional layer* represents the governance frameworks (including the provision for third party input). Formal and informal governance structures (internal and external) provide the rules that ultimately frame the activities of the actors within

the market environment. Included in this layer are the broader institutional norms that are not necessarily formalised but that also affect the interaction between actor and institution on a social level. Enforcement forms part of the institutional layer and involves a combination of physical resources as well as norms that are shared between participants within the institution. Secondly, *the technology layer* closely mirrors the various rules and norms as part of its design and functionality. The processes that are facilitated by technology are measured against the set norms and are constantly aligned. The technology layer also collects and distributes information that is ultimately used for the creation of trust signals. The sources of this information might be internal or external to the system. Thirdly, *the social layer* is where the enactment of the various social and technology structures occur.

The case study illustrates how the alignment of the institutional layer and the technology layer allows the creation of similar enacted social and technology structures. The alignment of the enacted structures in turn influence similar assumptions around the predictability and ultimate trustworthiness of the institution.

The interesting aspect of the market environment is how the broader social structure affects the role and use of the central computer system. The system is drawn on as a resource by all parties as part of exercising their respective mandates. The various actors, after evaluating the various institutional signals re-evaluate expectations surrounding future interaction with the institution. The re-evaluation is informed by the collective trust signals, which allows the actor to position its actions within the broader context of the institution. Each of these layers work in tandem to create an environment in which institutional perceptions relating to trustworthiness of the collective are formed. The following sections elaborate on each one of these layers.

11.4.1 Institutional layer

The institutional layer represents the combination of rules and norms that influence the functioning of the institution. A hidden power struggle lies under the seemingly autonomous activity on markets. The central market system plays a pivotal role in empowering its users but also removes power from users for the good of the collective. The system is used to equalise information and power asymmetries through the enforcement mandate allocated to the management of the market in this case. Whatever the nature of the contract, it remains incomplete and open to opportunism (Menard, 2004). Safeguards built into the governance structures could be formal (special investments) or informal (relational and reputational).

These structures are created as part of the collective interaction of actors and serves as a resource to be drawn from when there is a breach in the primary trust relationships between actors.

> "In other words, today, trust based on individual actors' integrity can only fulfil a supplementary function, compared with trust produced by institutional arrangements." (Bachmann, 2001:348)

One can expect to find high levels of enforcement powers allocated to owners of the system and thus strong domination structures, given the high probability of opportunism and potential *unfair* domination of one party over another. The various actors on markets view these high levels of power in the hands of its management as an important aspect governing the broader institution. That does not mean that all participants are in favour of this situation all the time and/or that this situation is not abused by the holders of that power (see example of email exchange and the non-transparent tendencies of buyers in Chapter 10). But as was shown in the case environment, each one of the participants in the exchange also has power, either through the trust mandate in the case of the grower, or through the collective buying power on the demand side. These forces seem to be positioned in a self-regulating manner.

> "… we see the power that is putting pressure on the system is the natural commercial powers, but we do not have the strong policeman that uses their power to sustain the markets. We as agents do not have control over it. *The natural powers will destroy the system.*" [Interview Ref.: 1:4890]

A strong and well-resourced regulatory mandate needs to be in place. The market authority is the custodian of both public and private rules and through their actions communicates a sense of benevolence. The presence and effectiveness of an independent authority signals higher levels of structural assurance. The enforcement of the market's laws and requirements form a key part of domination structures if these are perceived to be credible. Third parties such as APAC are external to the market environment but due to the alignment with the common interest of serving the farmer as a collective, these external entities become an integral part of the market environment. Through the legal guidelines as set out in these third party acts, (PPECB would be another example) they become aligned with the local rules in force on the market internally. This is an important aspect to consider using SST within institutions. The institutional layer is presented in Figure 11.93 and illustrates the relationship between the supporting governance frameworks and the enforcement of these frameworks. Third party supports the institutional layer as complimentary sources of both formal and informal governance and enforcement sources. At the core of

these structures lies the support for contractual facilitation which is fundamental in order to provide commercial legitimacy.
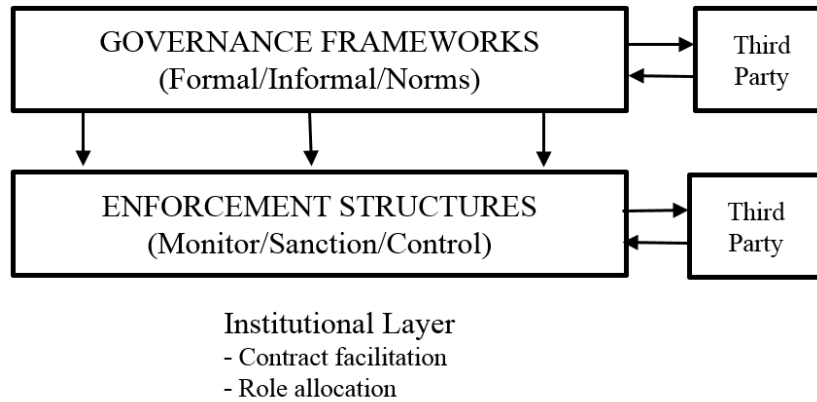
Figure 11.93: Institutional layer of the conceptual framework

The following section discusses the technology layer.

11.4.2 Technology layer

The computer system plays a key role as an entry point in and out of the market environment. From a physical perspective, the computer system forms the physical boundaries of actions users can perform. Embedded in the functionality are the processes and rules dictated by the system owner informed in turn by the institutional layer as discussed in the previous section. The technology layer acts *as a resource* for the various actors using a self-service interface. Depending on the particular role, actors draw on different meaning from the system (See Table 11.1). In the market environment, the market authority had a very clear view on the technology layer as a resource drawn on to dominate the participants within the market. The technology layer also acts as *an aggregator of data*. The sources of this data are either internal or external. Especially within an environment where all interaction is mediated by a self-service solution, the ability to facilitate the flow of various data sources represents not only internal transactional activity but also the external. The physicality of the product requires a specific focus on the incorporation of data emanating from the various assurance functions (third parties). The use of third party certification provides assurances to participants and offers a way of communicating legitimacy electronically due to the quantifiable nature of certification indicators. Signalling compliance through enforcement and monitoring of these various standards reduce the perceived risk and thus increases trust. An important aspect of

especially food chains is the need for traceability of product. Traceability involves the identification of fields, growers, locations and produce in all packaging and transport/storage configurations at all stages of the supply chain, including the history, application or location of an entity by means of recorded identifications (GS1, 2010). These are broad and challenging concepts as it involves the integration of other institutional structures. Within the conceptual framework, reference is simply made to external data sources.

In the case of the market environment the hardware/software as facilities are not exposed to constant change as these are fixed. The intention is not to view the technology (and institutional) layers as constantly evolving. This places the emphasis on the social interaction through norms and interpretive schemes to enact structures. Due to the rigidity in the processes, the actor is faced with a fixed set of norms that is shared amongst the participants. This leaves a reliance on the assumptions the actor makes about the technology artefact to determine the structural characteristics of trust. One has to differentiate between the functionality the actor uses and the trade aspect for which the functionality *is used* (its purpose). Bad commercial decisions for example might affect the trust in the other trading party, but not necessarily in the institution itself which merely facilitates the trade.

Collectively these form external data sources have to be recognized as part of the approach towards providing a more complete information set. Without credible information, the actor is not in a position to form accurate risk perceptions. Control over and ownership of information allows for the explicit enforcement of transparency, which ultimately influences trust perceptions. Closely related to the flow of information is the level of detail that is made available to the actor. The manner in which the detail is reflective of the actual perceived activity (reality) affects the confidence of the actor. The level of granularity of information that is fed back to the user enhances transparency and trust in the solution. To be in a position to provide this level of granularity, access to and the ownership of processes to collate this level of data is required. Especially where there is a principal agent relationship as is the case within market, the ability to provide high levels of granular information back to the principal is a prerequisite.

> "Signals indicate a trustee's trustworthiness in a given situation and thus form the basis for
> a trustor's trust. However, these signals are subject to mimicry, because non-trustworthy
> trustees will aim to be perceived as trustworthy. Hence, knowledge about trust-warranting
> properties cannot be expected to completely solve problems of trust. However, by
> designing socio-technical systems with knowledge about the underlying mechanics,

designers can aim to minimize misplaced trust and untrustworthy behaviour." (Riegelsberger *et al.,* 2005:414)

Market management draws on the system motivated by their mandated role as custodian of the rules. Enacted structures of enforced accountability, correct power asymmetries and establishing authority are examples of such structures. Performing these functions, inform the institutional structures in turn. In a similar manner, the agents also draw on the system through compliance structures to signal compliance to rules. This in turn signals to the growers (in this instance) that the agent itself is complying but also that the institution is enforcing rules. External parties such as growers are therefore also in a position to form trust perceptions of the institution through aspects such as a communication channel (the producer communication example in the previous chapter).

Rowan (2012) asks what the modern market might look like when we broaden our service offering? The potential characteristics are:

- Web of interoperable market places;

- Integrated back office mechanisms;

- Regulatory regimes;

- Settlement mechanisms;

- Liquidity and funding mechanisms.

All these aspects requires the integration on a technical level with systems external to the particular service environment. Again, these are informed by the institutional layer and facilitated by the computer system. Other parties external to the system, such as the Registrar of Act12 draws on the same system to allow for the auditing of compliance and to investigate cases brought against agents. Terms such as closer to the coal face indicates the possibility need to share the structuring effect of the central system. In Chapter 10, the need to bring external role-players such as the grower closer to the market was expressed by market management:

> " … once you start allowing them to come closer to the coal face, closeness, involvement and you actually start improving their ability to influence the process and they are no longer just an outsider to the process, they move from an outsider to an insider, they no longer reactive, they can actually be involved and pro-active." [Interview Ref.: 1:5124]

As a resource, the system functions as both an allocative and an authoritative resource in the hands of the owners and the users of that system. Figure 11.94 illustrates the technology layer. Self-service only forms one component of the greater technology eco-system, it is the central contact point between the actor and the institutional environment acting as the access point to the institutional environment. The various data sources is consolidated within this layer in order to provide a single point from which information is distributed. The technology layer is directly influenced by the governance layer and all aspects of the functioning of the technology layer is governed by the required rules and norms of the institution. The layer offers a physical resource for the enforcement of rules and norms. It also serves as the source for actors' enacted structures, both technology and social structures. The manner in which the institutional layer and the technology layer are aligned assists in structuring the perceptions of actors.
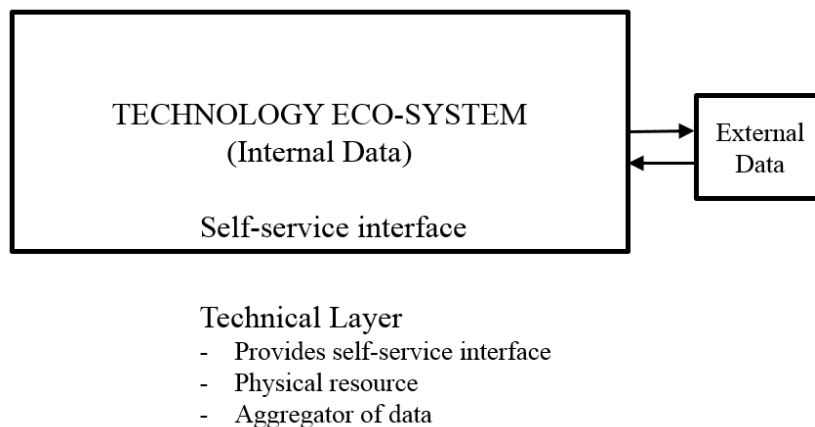
Figure 11.94: Technology layer of the conceptual framework

Table 11.2 summarises the various technology structures enacted from the case study. The institutional layer and its alignment with the technology layer are illustrated through the types of structures enacted. From the agent's perspective, compliance to the set rules informs the norms of the actors. Similarly, market management and external parties such as the APAC are informed by their legislative mandate. These enacted structures are ultimately tied to the broader institution of a market and its functioning, something which the various participants acknowledge and collectively buy into. This complimentary relationship between the institutional layer and the technology layer forms the foundation for an environment in which both the social and technology structures enacted are aligned with the broader institutional mandate as well as with fellow actors. Through the conceptual framework, I will argue that this aspect is a critical component in creating institutional trust through self-service solutions.

The following section discusses the social layer.

Table 11.1: Summary of technology structures enacted

Technologies-in-practise	Primary Actor	Motivation for action	Norms associated with the use of the technological artefact.
Recording of transactions	Agency staff (via market's system)	Recording of delivery to ensure stock control. Recording of sales transactions.	Norm of compliance forced by the workflow embedded within the market's system.
Forced compliance	Agency staff (via market's system)	Perform sales function and report sales to grower. Customer service as response to queries.	Perform sales function and report sales to grower. Customer service as response to queries. Norm of compliance to governance structure combined with personal integrity motivates use of system.
Monitor/Evaluate	Grower (own system)	Monitoring of transactions to ensure integrity of information.	Grower monitors agent activity to prevent risk.
Audit of activities	Registrar of Act 12 (APAC)	As part of an investigation or as part of monitoring of compliance.	Norm of compliance informed by a regulatory mandate.
Enforce accountability	Market management	Enforcement of breaches of procedures and rules. Enforcement of regulatory requirements.	Norm of enforcing accountability.
Correct power asymmetries	Market management	Power asymmetries between grower and market agent. Risk of potential opportunistic actions of the agent.	Norm about unfair power distribution.
Establish authority	Market management	Knowledgeable about the application of the output from the system.	Use of the market's computer system to draw activity related data.
Market personnel function	Market personnel function	Monitoring of compliance to set rules of trading. Enforcement of deviations to compliance.	Norm of enforcing and monitoring activity.
Buyer function	Buyer	Buying function, needs to procure product. Requires information from the system regarding the aggregate price and	Norm of fair practise, trying to procure the lowest price. Needs to place the transaction in a broader context.

		quantity levels in order to make decisions.	
Agent/Salesman function	Agent/Salesman	Commercial motivation, needs to sell product through the system. Requires information from the system regarding the aggregate price and quantity levels in order to make decisions.	Norm of opportunistic selling, trying to procure the highest price.

11.4.3 Social layer

Trust is an abstract concept (Giddens, 1990). Developing institutional trust requires stable and ongoing commitment to trust sharing the same beliefs (Wicks *et al.*, 1999). The dynamics that shape these interactions draws on more than just personal trust. It includes perceptions of trustworthiness of fellow actors as a collective and the availability of institutional protection and recourse. In the preceding discussion, a role emerges for the underlying governance structures to act as recourse, a secondary layer to provide structure users can draw on when primary trust fails.

The conceptual framework illustrates how the perceptions about structures is informed through *collective institutional signalling*. This merely illustrates the collective institutional perceptions that actors draw on as communicated via the technology layer. Individuals enact individual structures and this is compared to the collective institution as part of the determination of future trust expectations. The more similar and aligned the individual and collective structures are the greater the predictability of future interactions and hence trust. Highly institutionalized norms as in the case of the market environment will result in similar perceptions of the institution. Through each routinized interaction, the individual structures enacted are informed by personal experience. Frequent recurring transactions of a similar nature are a characteristic of the industry (Menard, 2004). Figure 11.95 illustrates the social layer incorporated with the institutional and technology layers. Individuals interact with the various structures of signification, domination and legitimation via the process of stratification where knowledgeable actors interpret their and other actor's behaviour through a reflexive process to inform subsequent decisions to act. The institutions and its various structures supersede the power and influence of its individual actors and exercise constraint onto the participants both containing and enabling action (Mendoza, 1997:220). Technology becomes a tool of constraint and condenses the power available to its users but also allows allocates additional power to

sanction and have access to decision making facilities. This give-take relationship between the system and its actors and the consequences of this relationship is institutionalized through routine of action over time.

> "Frequent transactions paired with renewable contracts provide the possibility of withdrawing from future business if fair play in sharing gains generated by mutual efforts, is not respected." (Menard, 2004:365)

Routine within structuration theory plays a central role in providing ontological security and diminishing anxieties (Willmott, 1997:168). On the personal level, the role of personality and personal trust levels will affect the participation, but this aspect alone does not influence participation. Driven by a mandate and the provision of broader contextual aspects, participants proceed to interact. The framework illustrates various aspects that can assist in influencing future actions. Some key aspects were identified that not only affect trust as a singular construct but also influence and support other trust forming elements as a collective. The various aspects in combination drive trust-forming behaviour. The major elements identified were:

- Granularity of information;

- Boundary setting;

- Role clarification (identity based trust);

- Positioning (provide transparent context);

- Routine interaction (embedding of trust structures).

In addition to these items, aspects such as privacy, credible commitment, control and transparency are employed to provide a series of signals that SST need to deliver to enhance trust within fresh produce markets. Control emerged as an important element and the ability of the actor to make a personal invest into the transactional.
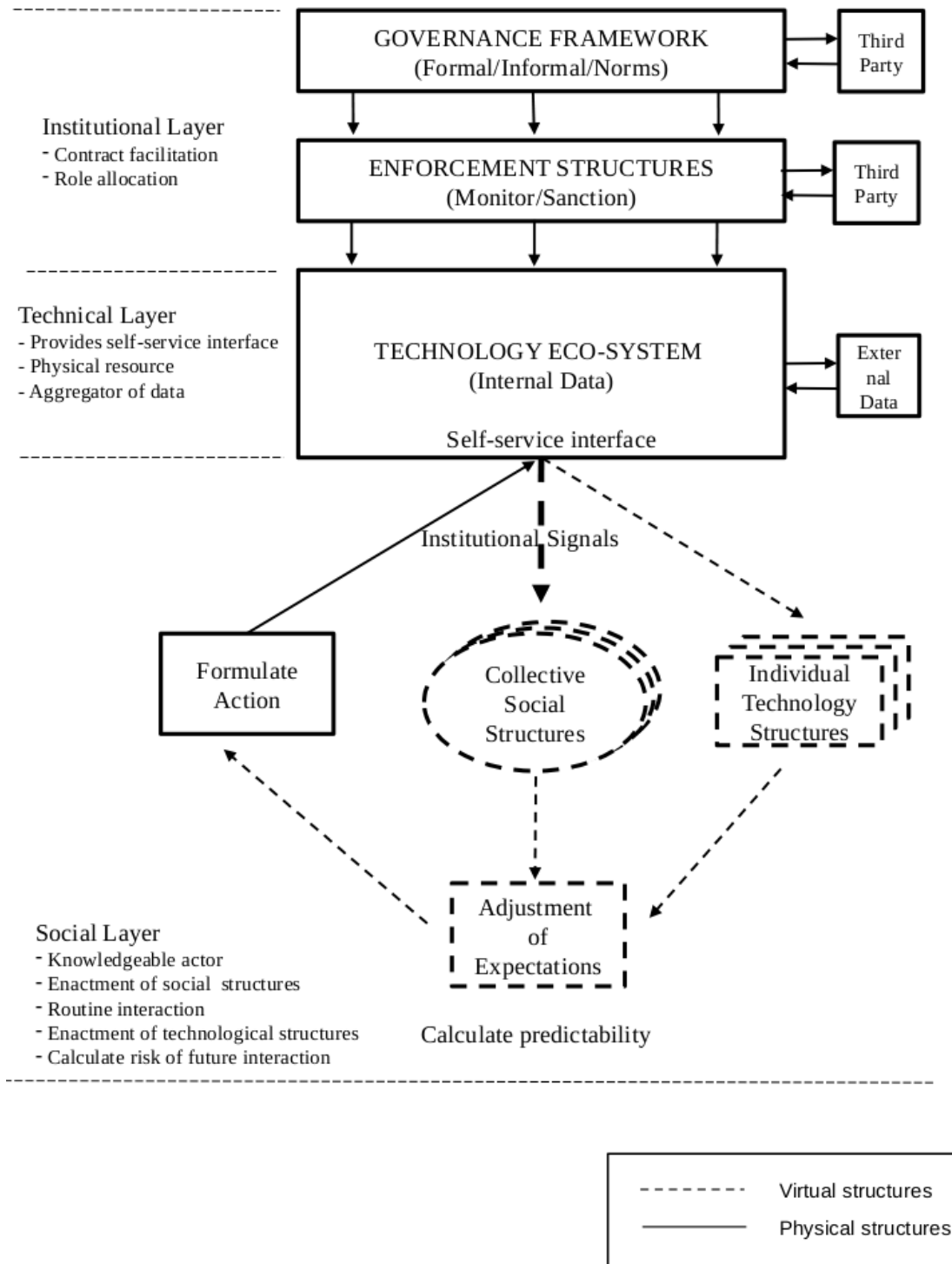
Figure 11.95: Conceptual framework

Greif (2006a) lists the certain characteristics of institutional environments:

- Establishment of structures to allow for the *identifying of community* members by both the community and non-community members,

- *The cost of joining the community* was increased to avoid merchants joining that would abuse the structures and dent the reputation of other members,

- The *cost of joining and exiting* were such that it motivated the *retention of the membership* and the conformation to the court's rules.

The themes that emerged from the empirical data certainly mirror these aspects. Within markets, all parties are identifiable and vetted by the central market authority. Access and exit of the agent (being the custodian of the produce) is governed by various license costs on the market and a fidelity fund certificates with the registrar.

Ultimately, the actor is placed in a position to perform the act of trust by explicitly engaging with the institution. Action represents the manifestation of trust intentions. Due to the progressive nature of the engagement with self-service (motivated by different requirements for example), these actions become part of the collective pool of data that is used in turn to create collective institutional signals. The actions of the actors represent trusting intentions and the technology layer extracts these and distributes it back via a feedback process where the various trust signals are interpreted by the actors and this informs new actions. Underlying these interactions is a process of trust forming or the structuration of trust itself as an underlying structure (although Giddens did not explicitly position trust as such a manner). Multiple role players transact with such an institution and form perceptions about the other transacting party and the institution itself as a collective. Structure is tied to knowledgeability as practical consciousness (Mendoza, 1997) and this is also informed by the output of the collective. The conceptual framework illustrates this recurring aspect.

Structures of legitimation represent the rules and norms that are accessed via actions of sanction. Parallel to the ownership and power roles, the levels of assurance, accreditation, certification and legal frameworks provide a framework where not only sanctioning by all actors is possible but also sanctioning in a transparent way is achieved. Sanction within SST could occur within a framework that is transparent to all collectively across the exchange providing feedback (on aspects like reputation for example). The legitimacy of the sanction is important to protect and this is where an objective authority plays a role. They are the party that have to consolidate and enforce the various legislation, not only their own, but that

of third parties (as discussed above). A working relationship exists between the market authority and third party structures to increase the scope of sanctions.

The trust perceptions of actors influence subsequent actions of the various role players in that they can expect the same interaction with various national markets. Giddens distinguishes three types of constraints: Material, structural and that originating from power relations (Mendoza, 1997). Material referring to the physical limitations of both the actor and its environment restricts potential options open to the actor. Structural constraints refer to the structures found by the actor that are already in place and lastly constraints generated by power relations are those that originate from mandated power and enforcement:

> "… power relations are often most profoundly binding where they are taken for granted
>
> and unquestioned as part of day-to-day life." (Mendoza, 1997:224)

Various actors are actively performing their tasks in line with a specific mandate. Within structuration theory, the actor is deemed acting on knowledge sources from the "reservoir which consist of interpretive schemes, norms and facilities" (Mendoza, 1997) which are the codes, which produce actions. Actors are constantly seeking *a form of* "ontological security" (Giddens, 1984) through the routine of interaction with institutional structures. Seeking security to reduce risk and hence a situation where the environment is seen as predictable, knowable and ultimately trustable. The *context of action* forms the heart of the conceptual framework, as the actor is the source of signals via action and the interpreter of the collective signals, which informs the next action. Actors interact with their environment and ultimately trust affects their recursive perceptions of the specific structure. This affects future decisions.

It is important to re-emphasis that the structures are virtual memory structures and not physical structures. *The elements that supports trust forming has to influence the actor's perceptions of these structures and ultimately inform the actor's next action*. Trust perceptions are informed by the institution that is collectively created by the various actors during interaction with the various other role players.

> "It is obvious that each stakeholder has his own objectives and his own performance
>
> measures. But it was also recognized that the performance of the chain as a whole is more
>
> than the sum of the performances of each individual chain member. " (Ondersteijn *et al.*,
>
> 2006:5)

The importance of allowing a user to position themselves and their actions within the broader trading

environment strengthens situational normality. Actors seem to benchmark their experiences against that of the collective on markets. The outcome of a particular price negotiation alone is important but also for example the outcome relative to other outcomes within the market. Aggregated information plays an important role and needs to be fed back to actors. Aspects like price and availability indicators across the institution allows the actor to not only make educated decisions but to have comfort that those decisions do not include levels of risks that are far removed from the group norm. This is a continuous process and positioning is not just related to a transaction. Knowing that you trade with a credible partner, for instance based on the views of the collective, contributes to the perceived lower relative risk. The deliberate inclusion of elements that might indicate levels of opportunistic behaviour is central to the creation of situational normality. In this way signals that allow for positioning contributes to trust formation.

The conceptual framework illustrates how the repeated routinized actions allow actors to draw from similar technology structures *in combination with embedded institutionalized norms*, increase the predictability of future engagements. Predictability has been shown to build institutional trust (See Chapter 5). Using the various models in trust literature, especially the model by Riegelsberger *et al.*, (2005), illustrates the progressive nature of the trust formation process is closely linked to the constant evaluation of signals from the trusted party. Referring to the various contextual trust warranting properties, the trusting party draws a combination of social and institutional signals (symbols and symptoms) from the trusted party.

Table 11.2 provides a summary of the various social structures. Domination structures reflect the various power positions individuals occupy. Positions within markets represent very specific roles, which are allocated very specific resources. These are directly linked to roles allocated to actors and the subsequent knowledge resources to which they have access. Ownership plays a role in creating the various mandates; ownership of the facility (platform), ownership of product (grower), ownership of information and ownership of funds, all contribute to create an ownership structure that allocates mandates and ultimately provides power positions. Rules and resources only exist within a specific context (Layder, 1997) and within the market, the role allocation and structure are not left to market forces to determine.

Thus, we can expect that structures of domination will look significantly different if applied to other industries in the same manner. Governance structures are important clues to what one can expect dominance structures to look like within such an environment. In the case of South Africa, these structures

are aggressively enforced and thus the boundaries and role allocations within these structures are clear and established.

The governance structures are aligned with the physical control of the trading platform and its immediate environment. This in itself amplifies power. Structural power can be argued as being separate from agency (Layder, 1997) but the interaction of different participants may or may not challenge the power structures. We have to keep in mind that all "… interaction involves the use of power" (Giddens, 1981:28). But within a mature structure, the conflict is channelled for commercial transactions and not as a challenge to the status quo. Within the market the conflict that is part of the price discovery does not pose a challenge to the credibility of the structures of domination because the *playing field with its rules* is accepted by all. Because the various role players are familiar with the system and the system is viewed as broadly fair, the buy-in of the various participants provides a higher trust in the institution itself, regardless of the conflict between transacting parties. Within structuration, no single agent holds all the conditions and circumstances of his own actions and has the complete power to affect structure (Mendoza, 1997). These agents are bounded both as far as rational behaviour and structural power is concerned by the resources applied as part of these structures of domination. Structural power is defined as "… a set of (prior) reproduced asymmetric social relations between groups based on the possession of and restriction of access to certain resources." (Layder, 1997:107).

If one looks at some of the other examples of wholesale markets, similar structures exist but their boundaries are drawn differently. Especially in the context of this discussion, the ability to use the central computer system as a tool to assist the enforcement of rules will be greatly inhibited on other wholesale markets where they are not in control of such a system and have to rely on secondary measures (gate control, inspections etc.) to regulate and monitor activity. There is a distinct difference in the power positions between such a market and the markets in South Africa and hence the overall institution looks different although they are also acting as a market. This restriction is extended to the absence of technology as platform to exercise power and places a restriction on the power levels of all participants whether they are market authorities, agents, buyers and suppliers. Suppliers for instance lose their ability to control and exercise power over their produce and need to rely on delayed communication channels for transparency. In South Africa's case, the market uses its position of power to enforce transparency back to the grower and in this way provides not only assurance but also power to the grower. The conceptual framework illustrates the various aspects that shapes trust forming behaviour through self-service technology.

The following section discusses the validation of the framework.

Table 11.2: Summary of social structures enacted

Description of relationship	Structure	Facilities	Comments
Agent and Grower relationship	Domination	Agent knowledge (about demand and supply forces) Trust (Agent/Grower) as allocative resource. Mandate given to agent to sell on behalf of the grower. Trust used as authoritative resource.	Grower is spatially removed from the location where the goods are sold. Agent draws on the trust relationship to protect the supply of produce against competition. This is provided as part of the agreement.
Agent/Grower/Regulator	Legitimation	Norms of ethical behaviour influenced by Act 12 (Rules) statutory requirements. Norms of good practise.	The actions are motivated by the protection of the interests of the owner of the product, namely the grower.
Market management / Agent relationship	Domination	Market computer system ownership. Regulatory mandate to enforce both internal and external governance.	Ownership is an important prerequisite for control.
Market management / Grower relationship	Domination	Allocation of access to computer facility.	Address power asymmetries between grower and agent.
Market management versus users	Legitimation	Establishes collective norms.	
DAFF to Market management	Domination	Legislation covering the packaging and grading of price on the market floor.	Department issues a directive to the grower but communicates via the market authority.
Market management to agent	Dominance	As owner of the agent's license and the condition of trade (which is aligned with all national legislation).	Agent draws on the trust relationship to protect the supply of produce against competition.
Agent to Market management	Legitimation	Norms of fairness Norm of acknowledgement and recognition of authority.	Agent's response is to turn to norms to protect their interests.
Service provider vs grower (off-market)	Domination (Service provider) Domination (Grower)	Service provider has limited ability to affect change. Weak, cannot draw on the system as a tool to affect change. Ownership of information. Ownership of system through a license.	Technology and process needs to be integrated in a single framework. A mandate (tacit or explicitly) is required from the grower in order to distribute the information.

			Assurances regarding privacy are crucial. Information not shared because of fear that competitors will use it to their advantage.
Market management	Domination	Information level of granularity. Power to use control over system and rules to dictate and enforce compliance. Ownership of computer system.	Low levels of detail allow the market management to address transparency within the market as well as outside it.
Wholesaler's view on information distribution on markets	Domination	Transparency is viewed as a negative aspect as it prevents the "wheeling and dealing" potential for opportunistic trading. The rules of system use prevent the buyer from not being transparent.	Technology and process needs to be integrated in a single framework. A mandate (tacit or explicitly) is required from the grower in order to distribute the information.
External supply chain partners / service providers / market management	Domination	Ownership of systems	Supply chain partners seek to enforce their own standards on fellow supply chain partners. Service provider not able to integrate in a holistic solution.
Market management's role in monitoring governance.	Legitimation	Norms of compliance. System allows for routine enforcement of norms.	System is a resource to allow the market management to monitor and enforce compliance.
Market management's role in monitoring governance.	Domination	Market system ownership and control.	System allows for the monitoring of the activity, which in turn gives the management a resource to enforce pro-actively compliance deviations.
Stakeholder's level of interaction (currently excluded).	Domination/Legitimation	Use and access to system on a real time basis.	Access to the system by currently excluded stakeholders will assist the neutralisation of information asymmetries.

11.5 Validation of conceptual framework

The framework above was presented to interviewees in order to test its accuracy and relevance. Two presentations were made (See Table 11.3). Both the participants have extensive experience with implementing self-service although focusing on different services within the market environment. C2 was selected because the organisation has been offering self-service type solutions as part of the administration process for the last thirteen years to growers across South Africa. This company provides full self-service

via the internet that allows growers to access all administrative data from all the markets in South Africa. In addition aggregated information from the various markets are consolidated and made available to both growers and buyers. No trading level functionality is provided as this is the domain of the various market systems which are still localised. C2 services around 5000 clients offering access to daily reconciliation of consignments as well as all payment related electronic invoices. The manager of the organisation has been with the company since its inception and has grown with the organisation through the years. He has gathered extensive experience interacting with clients and specifically their perception around self-service and the market as an institution.

The framework was also presented to a senior manager within market management (C4). The manager was selected because of his extensive experience within the market management structures specifically as part of the implementation, management and enhancement of the central computer system on markets. The individual also plays a central role in the planning of new self-service solutions within the market itself. Self-service solutions are seen as a core focus area as part of future enhancements of the market's central trading system but the various solutions planned are only basic information and administrative related services.

In both cases the individuals received the proposed framework positively indicating that it not only accurately reflects the dynamics of the market environment, but also that the various components successfully illustrate the dynamics characterising trust formation through self-service. The views of these two individuals are presented below.

Table 11.3: Validation of conceptual framework (C=Company)

REF CODE	CATEGORY	TITLE
C2	IT system provider	General manager (13 years)
C4	Market management	Director Revenue and Financial management, responsible for the market trading system, market safety systems and financial management system (19 years)

11.5.1 Comments: C2

The following are sections taken from the interview from C2 and illustrates the individual's view of the conceptual framework.

> "Broadly it does fit in, it speaks to me, I understand what you are trying to say, I agree with the concept you are putting across. In that if you do not have these components the end user, the person … it does take all of these things, the social, the technology the

enforcement to give that person trust. In my experience when I have spoken to people who are suspicious what an agent is doing, if you tell them that there is an APAC there and that the market system is not controlled by the agent, it is controlled by the market authorities and that there are by-laws… the signals you give are critical to his perceptions and his ability to interact with that in an trustworthy basis, so I definitely understood. In my own experience, with C2, if I did not trust the market system and if the signals were not coming correctly from the market system, I will have a real problem trying to access whether what was happening there was correct or not.

I think all the layers that you put in there are the ones that are important, I do not know if there are any others that you could put in there, I do not think there are at this stage. And definitely the collective, the signals that go around and that come from these different layers, are the ones that do give the user the ability to trust what is going on. It has got to be more than just one thing. Even at C2 they can question our integrity, if we did not have all these other layers above us, they would not be able to trust us, if there were not all these other components fitting into the picture, definitely." [Interview Ref.: 3:740]

The individual continued to describe the important role of aspects like the setting of boundaries to users, ability to position themselves and the provision of detail information play to compliment trust formation in the self-service solution.

"If all these layers work together, the signals that are passed on definitely help the people who are using the system to form trust that is necessary. Them knowing amongst others in the bigger picture, there understanding where they are, will form a pattern of trust behaviour, if he does not know what is happening generally, you cannot establish trust, if I was not able to look at the statistics for instance and know that my prices achieved weren't anywhere near the average, what would my basis of trust be in that institution?" [Interview Ref.: 3:1140]

Challenges that the model faces were also identified by the individual:

"To me the challenge is people. Getting the message across that what you are doing is only a part of … in other words you are just this layer and all the other layers are actually there. For instance, if you are referring to something like a virtual exchange, self-service what you are talking about, if the people using it, you mentioned the physical interaction with the product being a vital component of that. That would be lacking in a virtual exchange. However the trust perception you build from that virtual platform, the trust that gets built there will probably be even more important than all the ones that are currently acting out on a market situation now. Because the person will probably not even speak to anybody, at the moment he can phone the salesman or he can phone the market authority and say he is not happy. When you come to a virtual exchange you deal will this inanimate fear. Unless there is a concrete sense that you can trust this exchange, so all those role allocation the boundary and things which you know exists in the current physical platform, you will have to re-establish those in a virtual platform. In C2's experience for instance we … our thing is virtual I mean people log in and they see on a screen what information. They have to know, it can be concretised by getting an account sale from the agent that compares with those figures. They can actually verify it as it were. I think verification of what is happening in a virtual realm by another means is going to be crucial, that is one of the challenges.

How do you concretise something that is virtual? Once you set the transaction in motion where does the end user get there assurance, from that they have not set something in motion that will get out of their control as it were and end up being a mess. The real challenge will be establishing the credibility of the virtual market place, to the extent that the person knows that if they start this process the transaction that the end result is going to be good and in their favour. In a sense when a farmer sends his goods to the market now, because of all these other layers that are already there and the signals that are coming through. You have to establish all those signals for the end user. If you don't although the transaction is under his control the consequence and the result is not necessarily under his control.

It is a challenges to C2 to show people what we are offering and form them to get in their mind that this is acceptable information it is actually the real information from the market place and we can proof it. Until you actually show them this a lot of people are very sceptical about the offerings that we have because it is a virtual offering. How do you get the message across and how you going to give them the assurance, it is very difficult to do it." [Interview Ref.: 3:1155]

The above suggestion surrounding verification was introduced into the refined conceptual framework. The challenge noted around people and communicating the concepts as captured in the model to a broader audience shows a need for further research. This framework could effectively form part of such future studies. The following section discusses the response from C4.

11.5.2 Comments: C4

The interview with C4 provided a different perspective on the model. Being part of the governance structure of the market the model resonated with the interviewee. The initial interview with C4 was characterised by strong feelings surrounding the correction of power asymmetries in the market and also the protection of the grower's interest. One of the interviewee's main aims of providing self-service is to bring the various stakeholders (like buyers and growers) *closer* to the market. By bringing the user closer in this manner, it allows for the enactment of similar structures and the building of trust in the institution. A statement like they should "see the accounts from themselves" reflects the deliberate attempt to introduce the buyer in this case to higher levels of transparency and control which in turn is linked to predictability of the interaction (creating higher levels of trust).

The following are extracts from the interview:

"Governance and enforcement structures are inalienable to the system. Without that the system will collapse. Bottom line. And that is the problem with our markets, there is inconsistency with governance and enforcement. The other problem I think is that, if you look at the salesman level and the transition over time in the power balance between agent and salesman, I sometimes question whether the salesman actually understand this model the way they should understand it." [Interview Ref.: 2:2041]

"Good agent, good market management should understand this model. It is complex, I mean I realise that many years ago when I started looking at the structures and I started looking at the acts that are in there, the by-laws and I said to myself, a lot of the ways some of these things are written, you do not understand it at first, but when you start interpreting it you actually understand what it is doing as far as the system is concerned. And I think all of us lose sight of that, to be honest with you, I think we do, I really do and this kind of picture [referring to the conceptual framework] I think is necessary to bring people back again and say hey re-focus. Maybe it is time that it is done especially between agent and management and secondly between markets." [Interview Ref.: 2:2150]

What the interview also highlights is the difficult process of explaining the specific role the technology platform plays within the market environment. This echoes the call made in the previous interview and strengthens the case for the relevance of this framework to assist in explaining the dynamics surrounding trust formation. It is more than just the facilitation of the transaction, the system becomes the core that keeps all the power asymmetries in check.

"You know what big debate I had with the business analyst on our technology platform. They wanted to see it as a support services type thing. I said to them, you do not understand, this is not a support service system, this is integral to the system. If you see this as a support services type of technology platform you are completely missing …. The whole structure of that the fact that there is this centralised system is critical to this whole discussion that you have here. Every agent could have had their own individualised networks if this model was not the way it is. They could have all had their own cashiers and whatever. So when you talk about the system being designed and being more complex. Those things are not there by fluke, they are there for a very purpose directed reason, they there because there is a critical balance to the system in that, if you take that away you lose that critical balance and the whole things starts unravelling. The assessment is 100%, I agree with you." [Interview Ref.: 2: 3415]

The interview (like the previous one) also highlighted the need to use studies like this to communicate the dynamics of the market system.

"The biggest problem over here is not what you are saying there at the institutional level, it is on the human resources component of that level, it is actually on the people level. That's where the biggest problem is at the institutional level, with the governance and enforcement. The model is great, but the issue here is correlating the people to the model and getting them to say this is how we all see this and we agree." [2: 4140]

The interview concluded with the following comment:

"I like the model at the institutional level, I like it in terms of the technical explanation, I like it in terms of the social layer you are giving me, I agree with the whole concept that you have it is great. I think what is lacking in our industry is people do not understand this model, seriously, if you had to speak to people they will agree with you, but did they see it like that before they spoke to you, I wonder. I have a question mark behind that. [2: 4300]

The conceptual framework presented to the two interviewees represents a contribution to the industry and should be pursued as a platform for both communicating the current market dynamics to its various stakeholders but also as part of future studies. Both interviewees expressed their satisfaction with the accuracy of the framework. During the interviews it became apparent that the framework requires some adjustments. The following section discusses these adjustments.

11.6 Refined conceptual framework

Subsequent to the follow-up interviews as presented above the conceptual framework was refined incorporate the following aspects:

- To avoid any uncertainty regarding the various concepts, the internal and external environments were framed. It is important to state more clearly that the model is positioned as part of a broader supply chain and that the various external linkages are explicitly external to the model. The external environment is also not under the control of the stakeholders on the market and has to be approached as a separate and indirect influence on trust formation within the market environment.

- Interviewees also differentiated between the institutional and social components of the model. In order to enhance the descriptive ability of the framework it was grouped into a sense-giving (institutional/technical layers) and a sense-making (social layer) section (Li, 2014).

- Physical verification of information was highlighted as an important part of a user's interaction with the institution in a self-service context (C2 interview). This element was added as part of formulating action within the framework.

- Although fully understood, the framework did seem to require more the inclusion of more context surrounding the potential collective signals the institution needs to produce. The various aspects that were highlighted that forms part of the collective signals were added at the bottom.

- The abstract nature of structuration is difficult to communicate to individuals not familiar with the theory. Certain trust concepts were introduced to contextualise the framework in terms of trust.

Taken together these changes should make the framework easier for readers to understand. The refined framework is presented in *Figure 11.96*.
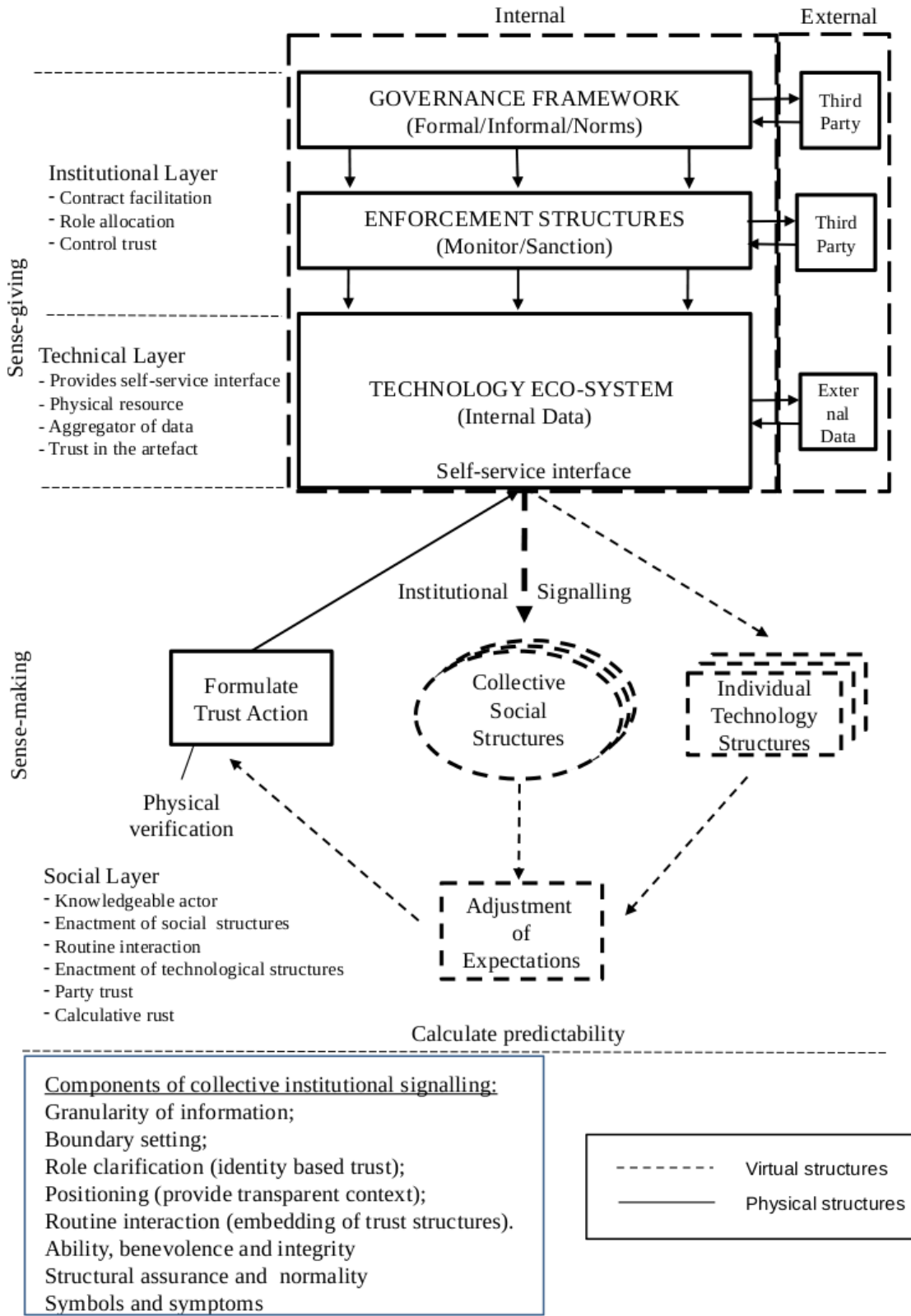
Figure 11.96: Refined conceptual framework

Self-service solutions form part of a broader institutional environment that incorporates more than just a transactional/technological dimension. How this institution is structured affects the ability of a technology interface to communicate trust. This is illustrated through the case study on fresh produce markets in South Africa and reflected in the conceptual framework above. Through a very specific combination of technology, governance and social layers markets can produce a high trust environment within which trade is conducted.

The framework was only presented to two interviewees due to budgetary constraints. Judging from the points made during the interview process the various interviewees shared a common view on trust and the relationship between trust and the institutional environment. Although the presentation of the conceptual framework would have assisted and enriched the study, the two interviewees (C2 and C4) constituted two senior individuals with extensive experience.

11.7 Concluding summary

This chapter presented the conceptual framework. It illustrates how the strengthening of trust using self-service within highly institutionalised environments such as fresh produce markets could be approached. The role of SST in the customer interaction has increased significantly making it an important focus for research. One of the challenges facing self-service design and innovation is the interdisciplinary nature of services itself. The conceptual framework illustrates the need to include the physicality of the product as part of the provision of self-service solution. The conceptual framework was also presented to interviewees and their response documented. Subsequent changes to the framework were made based on the feedback from the interviews.

The framework is descriptive of the current environmnet which includes a portion of self-service. But is can also be interpreted as a framework for the future. The underlying principle is that the actor-institution interaction can be seen to be similar to that of a fully self-service environment which has to cater for the same dynamics to ensure trust formation.

In the next chapter the study reaches its conclusion with an overview of the research questions and an evaluation of the research contribution is discussed.

Part 4: Conclusion

CHAPTER 12: CONCLUSION AND EVALUATION OF CONTRIBUTION

CHAPTER ROADMAP

PART 1 - INTRODUCTION

| Chapter 1 | Introduction |
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PART 2 – LITERATURE REVIEW

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CHAPTER 12: CONCLUSION AND EVALUATION OF CONTRIBUTION

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The 18th century French essayist and moralist, Joseph Joubert posited: "It is better to debate a

question without settling it than to settle a question without debating it."

12.1 Introduction

This chapter provides an overview of the thesis and concludes this research study. In chapter 1 the problem statement introduces the reader to the challenges of implementing self-service within broader institutional environments and highlights the need for a better understanding of how to facilitate trust within electronic fresh produce trading in the future. The important and arguably unique role trust and the use of technology play within South African markets where elaborated on in the various empirical chapters. Facilitating trust in this manner is a direct results of the design of both the underlying governance and technology components of these markets. It is not achieved as matter of chance. The case environment presented us with clues from within an industry on how the combination of institutional structure and technology combines to facilitate trust based trade. This chapter revisits the research questions introduced in chapter1 and reflects on these. This is followed by an evaluation of the study using various frameworks.

The intent of a research journey is to generate theory that explains a observed phenomenon, in this case SST and trust formation.

But how will the SST interface look and operate within such a future world? These environments are characterised by "the actual struggle between actors and groups" (Giddens 1984:198) on a continuous basis albeit through technological channels. It is argued that the current approach to SST lacks the inclusion of broader social and institutional dynamics, a critical one being trust forming behaviour of the actor. Technology removes the cognitive signals actors employ to form trusting beliefs and the re-introduction of these need to form a core focus area for future SST solutions. A conceptual framework is formulated in Chapter 11 to not only explain the observed phenomena of fresh produce markets, but also to provide a lens through which SST environments can be viewed.

12.2 Response to the main research questions

Theory is the currency of academic endeavour (Corley & Gioia, 2011). Every aspect of the research process leads up to the point where a theory is presented. That theory is linked to an identified research problem as Berthon, Pitt, Ewing and Carr (2002) state:

> "The first factor that drives the selection of a research strategy – the research problem – simply revolves around selecting the strategy(s) that gives the greatest utility in addressing the particular problem at hand." (Berthon *et al.,* 2002:425)

The main research question forms the entry point and also the conclusion of the research process. It initiates and influences all areas of the specific research journey on its road to discovery and concludes the process by providing an answer. Chapter 1 lists the main research question as well as a series of supporting questions. Taken together these form the context of the research. The main research question is:

What are the main components of a conceptual framework for the enhancement of trust using self-service technologies within fresh produce markets?

The conceptual framework developed in chapter 11 demonstrates how important the institutional structure is in order for actors to form trust perceptions through the use of self-service technologies. The various components are also discussed within the context of the empirical findings. The framework positions trust behaviour as a core part of the action of the actor influenced by the collective action of fellow actors as part of the context of action. This interaction creates institutional trust signals that in turn informs the actor's next action in a recursive manner. SST could not only facilitate transactions but also communicate trust signals back to its role players. These include signals from both the service environment but also include signals from the broader institution. The framework also highlights the importance of viewing trust formation as a recursive routine process Actors interact with structures and structuration offers us a tool to view the structuring informed by trust signals. The framework was also tested by presenting it back to interviewees after which certain adjustments were made. The conceptual framework as presented does address the main research question.

Various supporting questions were also listed and these are briefly discussed.

How can the provision of self-service technologies enhance trust in the "service" on fresh produce markets?

The aim of the thesis is to understand the facilitation of institutional trust via SST. The use of SST is gaining in popularity but the effective facilitation of trade within a fresh produce context is still lacking. It is argued in this study that trust facilitation via SST could contribute to the future development of food spot markets. Chapter 7, 8 and 9 present the service environment on markets. Chapter 7 and Chapter 8 illustrate the variety of role players, the nature of their interaction and the industry dynamics that shape the network of fresh produce markets in South Africa. Chapter 9 provides an overview of the workflows supporting service delivery on the markets and highlights the complexity of facilitating services to a diverse group of opposing role players. Markets offers a variety of services and the single dimensional

view that SST is just about transactional facilitation, is not a suitable approach towards SST implementations.

12.2.1 Facilitation of trust elements

What are the key trust elements that require facilitation through SSTs within fresh produce markets?

South African markets are structured in a very specific way. It is argued that this structure enhances and supports trust-forming behaviour to stimulate trading activity on markets. Chapter 8 describes the South African market and illustrates how aspects of a typical principal-agent relationship are supported via the deliberate combination of role-allocations and boundary setting. For example, the fact that an agent can only sell on commission and cannot take any ownership of the produce clearly demarcates the potential trading options open to a specific actor. This off course is done to avoid a conflict of interest which in turn could lead to opportunistic behaviour (acting in his/her own interest) which would lead to growers not trusting the market and ultimately pursuing other channels or insisting on more costly contractual agreements. The current market structure already offers a multitude of clues on how to structure such an environment within a more electronic facilitated future. These aspects were extended through the empirical Chapter 10 where various additional elements were identified that require facilitation within technology settings to signal trust.

12.2.2 Challenges to trust relationships

What are the relationship dynamics between trading partners in the fresh produce supply chain?

Relationships within the fresh produce industry are characterized by a high degree of potential opportunism. There are no formal written contracts and the ownership of the produce stays with the grower until the final transaction is concluded with the buyer. The grower is not present during the full sales cycle of his/her produce and this creates the opportunity for the trusted party (agent in this case) to act contrary to the best interest of its principal (grower).

Produce is consigned based on not only the integrity of the trusted party, but also on the integrity of the institution within which the product is received. Principal agent theory was used as a theoretical lens to describe the actions between the primary role players being the grower and the agent. The secondary relationship that exists between the market authority and the grower was also highlighted. This originates from the business model that uses commission from sales as the major revenue stream for both the agency

and the market owners. Within principal agent theory, hidden action and hidden information are presented as the key areas of potential opportunistic behaviour. Within future relationships, these two aspects will continue to play a direct role in trust forming behaviour via SST. Chapter 8 illustrates the areas where the rules governing the actions of specifically the agent is geared towards addressing aspects of hidden action and hidden information.

The structure of fresh produce markets highlights the following risks that forms part of the relationship between role players on markets (be it physical or electronic):

- Financial risk: Not receiving the money from the sales of produce;

- Price risk: Receiving a non-market related price;

- Product risk: Buying the wrong product quality and/or loss of product either through theft or through quality related issues.

The market as an institution needs to provide continuous assurances addressing these aspects. Moving into a more electronic environment the product risk emerged as a key area that needs to be addressed. Especially the accurate determination of product quality is highlighted from the empirical and the literature side (Chapter 7 and Chapter 10). Not providing signals that accurately reflect quality related characteristics, forces actors to employ physical measures (not utilising SST) to gain access to quality data and in turn, this reduces the trust in SST to deliver such matrixes.

Financial risk relates to the ability of workflows to reduce financial risk to actors. SSTs would play an additional monitoring function, relating to the transparency of the transaction and the identification of potential deviations. The underlying governance, monitoring and enforcement of the various rules and norms reduces the financial risk to actors. SST can play an indirect role in ensuring that related information is accessible and communicated and that the actor has the ability to sanction activity.

Price risk as indicated in the previous question is related to the ability of the system to provide price signals positioning the actor within the broader transactional context. Price discovery is a key portion of activity on markets and buying/selling at the right price has direct financial implications especially with the volatile fluctuation of prices experienced on markets. Price discovery does not only utilize quantitative results of historic transactions. It is also about more qualitative signals and the level of external information that is potentially available to the actors via SST. SST plays a structuring role in disseminating information flows across the market as a whole increasing transparency and reducing the perceived risk

to actors influencing trust in a positive manner. Chapter 5 provides an overview to various concepts relating to trust formation from the literature and these form part of the elements that is built into the conceptual framework.

12.2.3 Challenges to governance

What are the potential challenges facing the governance of trust in SST environments such as the fresh produce markets?

Governance is a key component in institutional trust formation. Chapter 5 and 6 illustrate the role of governance to provide structural assurance to actors effectively. Governance itself is not sufficient to regulate the action of actors. The ability and power to sanction activity effectively provides legitimacy to these governance structures. Without this ability, the use the technology as a tool to achieve this, potential risk increase and trust is adversely affected. SST can collectively form a sanctioning layer for the enforcement of not only formal governance structures but also informal norms.

Lack of control over the physical layer throughout the supply chain is highlighted as a potential area of risk. The use of third parties emerged as an important partner in providing assurance functions to counter this. The extension of SST to include these third parties would be required. For this to be effective, a broader view of data integration is required across the supply chain. This poses major challenges to the broader implementation of SST and in turn the ability to extend and integrate governance across the supply chain, keeping in mind that the supply chain partners are not acting within a vertically integrated fashion within a central hierarchical structure. SST could facilitate these broader signals across a broad spectrum of actors, potentially broadening the distribution and effect of the trust signals generated by the institution.

Ownership of the technology platform and access to data will directly affect the levels of transparency that could be achieved via SST. Market systems are being used as a tool by market management to enforce governance, but this is because they own and operate every aspect of the system as well as the processes. Without this component aspects such as control, trust and structural assurances cannot be assured, both elements central to institutional trust formation.

12.2.4 Role of power

What role does power play in the establishment and functioning of SST environments?

As indicated in the previous question, power plays a role in the ability to enforce governance. Power is also vested in the actors themselves and is used as part of commercial activity. All actors have inherent power (via dialectic of control) to affect the institutional structure (either through action or also non-action). However, these positions of power should not be extended to the ability to reduce transparency relating to actions and information. Markets are structured to balance out power positions and technology is used in a direct fashion to exert power. SST could facilitate these power positions but also need to equalize potentially destructive power positions. Power is part of the signalling using SST where the positions and actions are governed via the elements such as boundary setting and role allocation. In the case of agents, product knowledge plays an important strategic advantage during trading. SST can assist in equalizing these power positions in areas where opportunistic behaviour relating to trading itself is present. The ability of SST to be available anywhere anytime could have a structuring effect via power on structures of domination on a continuous basis.

The following section evaluates the research contribution using various frameworks.

12.3 Evaluation of research contribution

Research within the IS context involves more than the study of the IT artefact itself (Benbasat & Zmud, 2003). As shown in Chapter 2, IS research involves a very broad spectrum of applications and interpretations. But first IS related research needs to fall within the scope of what classifies as IS. Benbasat and Zmud (2003) state that IS research focus on:

> "(1) how IT artefacts are conceived, constructed and implemented, (2) how IT artefacts are used, supported and evolved and (3) how IT artefacts impact (and are impacted by) the contexts in which they are embedded." (Benbasat & Zmud, 2003:186)

As part of evaluating research Benbasat and Zmud (2003) ask whether the study investigates relationships that fall within the IS nomological net (Figure 12.97) and should not be too far removed from the IT artefact (Figure 12.98). The study should be intimately related to the IT artefact to qualify as IS research. The theme of this research is a socio-technical phenomena and thus exists within the context of both industry and technology. Context is important to understand in order to position the resultant theory. Chapters 7, 8 and 9 provide a detailed context to the study in order to address context this. This study covers the use and impact of IT on its operational and managerial levels and fits within the nomological

net as Benbasat and Zmud (2003) suggests. The important point that Benbasat and Zmud (2003) make is that we should not abandon the IT artefact as part of the research effort. Chapter 9 focusses specifically on market systems and establishes the IT artefact as a core part of the study recognising its role and place as part of the conceptual framework.
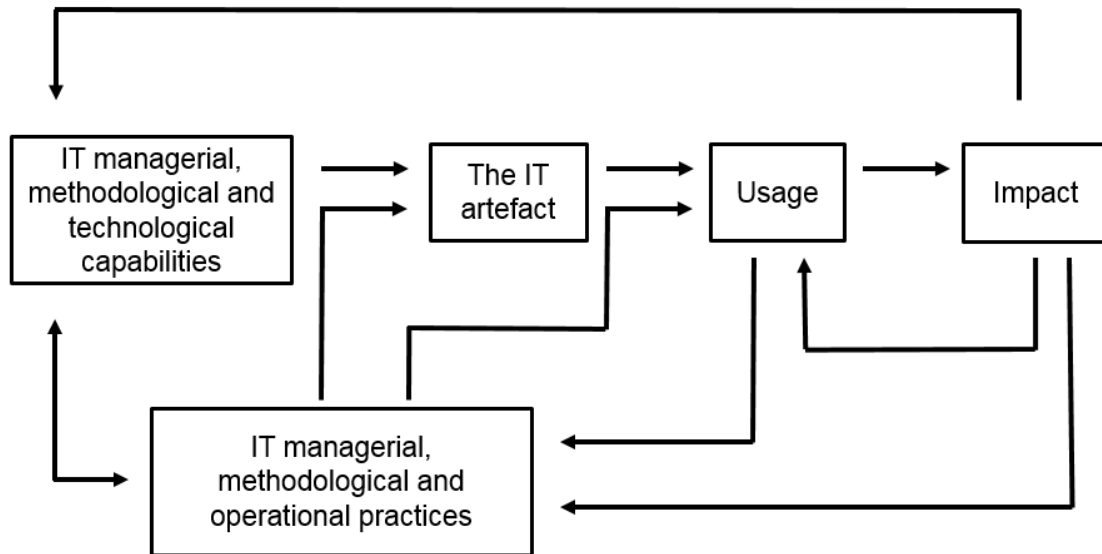
Figure 12.97: IT Artefact and its immediate nomological net
Source: Benbasat and Zmud (2003:187)

According to Bijlsma-Frankema & Rousseau (2012) trust research can be presented as a three layered space. At the bottom is the empirical world with which researchers have a direct contact. This layer is where data is gathered. The middle layer offers the theoretical background and provides the validity of the research. This is the operational layer where the order and synthesis of the research occurs. The top layer is where the theory is developed, the various elements are brought together to produce new theory. This research touches on all three layers.

Returning to the three main components of theory according to Levy and Ellis (2006):

- Certain propositions supported by defined constructs (or concepts);

- The relationship between the constructs is presented through a presentation of a systematic view;

- An explanation is made of the phenomenon in order to assist with predictions.

At the empirical level, the research generated valuable data covering the use of technology within the South African fresh produce industry. The approach towards trust research needs to consider the actual relationship to understand it, which is described by Sheppard and Sherman (1998) as follows:

> "When considering trust, we believe it is most meaningful to approach interdependence from the vantage point of the person or entity engaged in trusting behaviour (i.e. in agency theory the "principal," and in this article the "trustor") as opposed to the perspective of a third party observing or attempting to manage the interaction of two or more parties (the view typical of organizational theorists)." (Sheppard & Sherman, 1998:423)
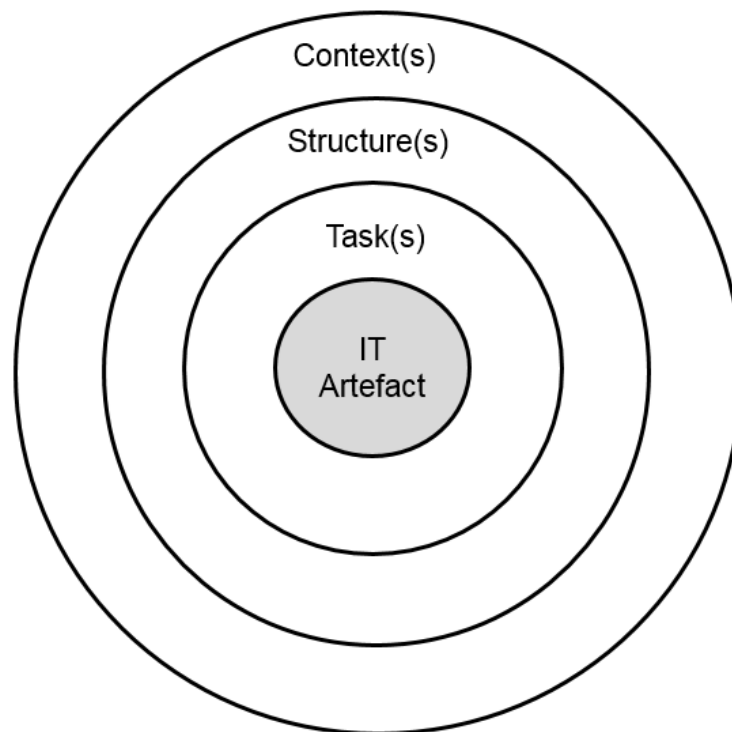
Figure 12.98: The IT Artefact
Source: Benbasat and Zmud (2003:187)

The important point Sheppard and Sherman (1998) make is that from the viewpoint of the trusting party, the relationship is unidirectional dependence, whereas from a third party, such as researchers, the relationship is bidirectional – we only view the interaction. For that reason, the interviews focussed on

individuals that are directly involved in the process in order to capture as much of their personal experiences as possible.

Focussing on trust and technology in this manner within the markets has not formed a key focus of research into the dynamics of markets. On the theoretical layer the study contributes to the use of structuration theory within technology settings. It is used to describe the structuring effect of trust via SST. The IT artefact itself forms a conduit for the interaction between the actor and the institution. In the extreme example, there could theoretically be no physical contact between any of the actors and structuration would be facilitated by only SST.

Although trust is discussed at length (see Giddens, 1990), it is not provided as part of the framework itself. Within this study, it is argued that trust is a key component of human decision-making and should form part of the interaction dynamics at the level of the actor. In this way, explicit recognition is given to the role trust plays in structuring institutions. The following section focusses on various evaluation approaches.

12.3.1 Criteria for evaluation

It is valuable to use frameworks to measure and reflect on the research journey. Corley and Gioia (2011) reduce the discussion of evaluation of research to two constructs; utility (usefulness) and originality. This would be correct as the successful operationalisation of research ultimately adds value to society and this contribution should be novel. But apart from the application of a research outcome, the actual research process needs to be credible. Klein and Myers (1999) offers a set of principles for evaluating interpretive field research. These are:

- The principle of the hermeneutic cycle: Interaction between part and the whole to discover meaning.

- The principle of contextualisation: A thorough understanding of the social and historical factors is important for the explanation of the above.

- The principle of interaction: Reflection on how research materials were constructed through the cycle of interaction between the researcher and the research environment.

- The principle of generalisation/abstraction: Relate the results from the interpretation of data to theoretical and broader concepts.

- The principle of dialogical reasoning: The chosen theoretical framework and the actual findings might contradict each other.

- The principle of multiple interpretations: Research subjects might have different interpretations of the same concept and these needs to be sensitivity in order to address this.

- The principle of suspicion: Researchers needs to be sensitive to any biases and/or distortions within collected data.

This section evaluates the research and seeks to highlight the researcher's attempts to honour these principles. Self-evaluation is a deeply subjective process that requires a framework to ensure objectivity. The interpretation of the various measures and the quality that is attributed to it, is both a subjective process from the author's side and from the readers side. Interpretivist research tools do not have the luxury of objective evaluation as is the case with quantitative tools. Each interpretivist research journey is in a sense unique but has to follow a systematic and structured route (Mason as cited in Carcary, 2009). Providing structure to the research process not only makes the research effort easier to present and communicate but also objectively defendable. It is with this as background that the following section looks at and reflects on the research presented in this thesis. The following frameworks challenges the research in different manners. In combination the results should provide for a suitable evaluation of this study.

12.3.2 Framework 1 - Carcary (2009)

Carcary (2009) provides an intellectual audit trail and a physical research audit trail review the research process. This process as depicted in Figure 12.99 is certainly descriptive of a research journey in general and also of this study in particular. It certainly involved the initial interpretivist/positivist debate as these two stances still dominate discussions surrounding a suitable approach. The initial phases of the process involved the evaluation and review of various philosophical stances leading to the formation of the underlying views as set out in Chapter 2.
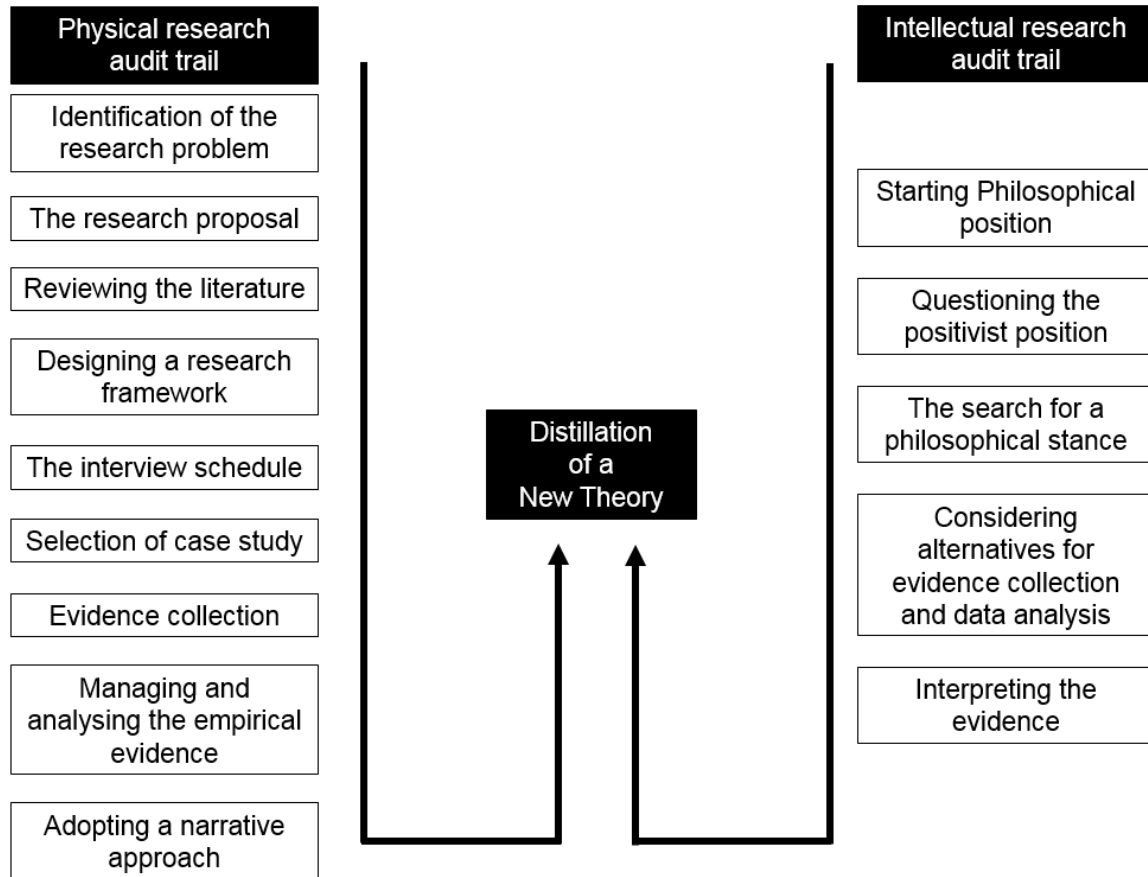
Figure 12.99: Research audit trail
Source: Adapted from Carcary (2009)

The philosophical stance influences the methodological approach. However, within IS the options or the combination of options requires the researcher to take into consideration not only the underlying philosophical stance but also has to marry this with the challenges of researching a broader complex social context. A combination of tools are used to collect and interpret data. It is important to ensure that the research retains validity to be explicit about the methods and to recognise both the positive and the negative aspects of choosing a specific option. This also applies to the interpretation of the data and how this process is packaged for the intended audience. The generation of theory within the interpretivist paradigm usually follows a narrative approach as this captures the "story". The source data and the interpretation of the data informs the resultant theory through this more subjective approach. This is where the research process needs to generate a contribution to the particular body of knowledge and where the intellectual capabilities of the researcher is employed.

The physical audit trail this study followed firstly involved the identification of the research problem.

Chapter 1 argues for more research into the institutional trust formation within food markets. Background to the growing food production was highlighted as part of the empirical chapters. One area that is lacking is the use of SST within the food markets in South Africa and it is argued that trust formation should first be understood within this context before the value SST offers can be unlocked.

The review of the literature involved a systematic scanning of relevant sources, the approach of which is described in Chapter 4. Following a systematic approach assisted the researcher in systematically selecting relevant literature covering philosophical, methodological, contextual and empirical issues. Using the literature as a base the research framework is designed and the actual empirical research is undertaken. As part of the research problem identification a suitable case environment is identified and this forms the boundaries for the research process. A series of interviews were conducted and transcribed and was used in combination with field notes, observations, internal reports and presentations, general media sources and specific website material to construct the primary narrative. The process is not a sequential one. The literature study and the collection and interpretation of data involves a recursive process where the emergence of new themes leads to search for relevant literature. In essence a certain level of grounded theory is involved as part of interpretive research using qualitative techniques. The narrative approach is guided by the analysis of the various data sources and the development of the resultant theory.

The conceptual framework used in this study has to be positioned within its operational context (in this case the fresh produce industry). Without this a theory and its assumptions affects arguments surrounding validity and transferability. Validity refers to the extent that the data and the interpretation of that data can be traced back to the process that generated it (Mertens, 1998; Yin, 1994) and in this case, the study is firmly grounded in the literature and empirical portions of the study.

The operational context further highlights potential limitation and strengths as other industries might share similar traits to that of the markets in this context. The degree of transferability is dependent on the similarity between contexts (Lincoln & Guba in Rodon & Sese, 2008) Within SST environment the recognition of governance frameworks, physical product assurance and control over the SST environment by impartial and objective management/entities is certainly shared by other industries. The perishable nature of fresh produce might not be shared in industries non-perishable FMCG and might be less relevant. These are examples to illustrate the importance of the operational context of the study in increasing the value of the theory that is produced.

The following section focusses in the framework of Davis(2005).

12.3.3 Framework 2 – Davis (2005)

Davis (2005) offers the following framework to evaluate potential areas of contribution a thesis offers:

- *Is it an "interesting question" that is part of an original work that explain, solve and proof/disproof a question, problem of hypothesis.*

The author would certainly argue that the topic under discussion is, apart from being very topical, also very interesting and novel. Food security and the role agriculture is set to play in the future to address a growing world population challenges us to find creative solutions. This thesis argues that well developed markets have played a central role in stimulating the South African agricultural sector and that the same model could play a vital role in the development of other countries. The challenge posed to the study is to identify elements that need to be communicated to actors within the market environment via SST that will enhance trust in the market. This was achieved and various aspects were identified (see Section 12.2). The study covered an industry and a research theme that has not enjoyed intensive academic attention.

- *The research should be guided by theory and concepts. Theory might come from the IS field, but might also come from other fields, like the social sciences.*

This thesis used structuration theory which is regarded as mainly a social theory but has a long history of various applications within the IS field (Chapter 3). A structuration approach proved to be an elegant way of looking at the dynamics of institutions and social structures like trust. An extensive literature study identified relevant concepts that was incorporated into the conceptual framework.

- *Present new or improved evidence: The thesis adds value if it adds evidence, assist in resolving strengthening proving/disproving conflicting beliefs.*

The research is novel in that it presents new concepts that forms part of trust formation within SST environments. The study did confirm the importance of aspects such as transparency, integrity, ability and benevolence as part of trust forming behaviour but it also added aspects such as positioning, granularity, role clarification and routine as concepts contributing to trust formation within institutional contexts. Analysis of the data generated rich insight into the inner workings of trust dynamics within the institutional environment of the market. Interviewees raised the ability to perform as a key element that builds trust. Myers (1997) argues for the generation of multiple viewpoints as part of the research process. This was certainly the case (See chapter 10). The fresh produce industry relies heavily on integrity as part of its trust relationships and this was highlighted in this study. The relationship between governance and trust

was also re-affirmed. Without market governance structures one could argue that the markets would move to more contract based (less trust reliant) methods of business. Markets are characterised by the fierce enforcement of market governance structures (formal and informal). The application of SST should produce similar levels of intensity towards governance in order to ensure high levels of trust.

- *Uses new or improved methodology: This would include longitudinal analysis, comparative analysis or analytical methods.*

The study used an interpretive case study which is a very popular but not a new method of research. Although not new, the choice of a case study as a method has to be guided by the specific research aims and objectives. The use of case study research was argued extensively in Chapter 2. Qualitative methods, especially interviews, are prone to the subjective influences of both the interviewer and the interviewee. A certain level of subjectivity needs to be assumed. The dangers associated with this method was analysed in Chapter 2 and it is recognised that

> "we are biased by our own background, knowledge and prejudices to see things in certain ways and not others" (Walsham, 2006: 321)

- *Develops new concepts/theories: supporting or explaining new concepts or theory.*

The research into trust and technology on markets are new and presents a fresh look at how institutional trust works, but also contributes to our understanding of food markets. The author would also argue that the conceptual framework could also enhance our understanding of similar industries looking at implementing SSTs. Myers (1997) asks whether the particular research offers new insights into the organisational and social aspects of IS development and contradicts our current understanding of the phenomenon. This chapter argues that this is the case.

- *Demonstrate and develop an improved design of conceptual or physical artefacts.*

Chapter 11 presents the conceptual framework for the enhancement of trust within fresh produce markets using SST. The framework is based on; various models describing trust forming behaviour (Chapter 5), principal agent theory (Chapter 6), structuration theory (Chapter 3), food market literature (Chapter 7,8,9) and the concepts emanating from the empirical portion of the study (Chapter 10).

The following section focusses on the framework of Whetten (1989).

12.3.4 Framework 3 - Whetten (1989)

Whetten (1989) approaches the question surrounding the theoretical contribution by using a what-how-why-who-where-when structure. The 'what' refers to concepts are identified and specified, the how refers to the relationship between these concepts, the why refers to the theorized explanations about these relationships and the 'who-where-when' refers to specific contextual environment that has to be stated clearly. From the various preceding chapters it is clear that these aspects were addressed. Whetten asks certain questions that guides such an evaluation.

- *Does the paper make a significant, value-added contribution to current thinking? (Myers 1997)*

The main contribution of this thesis lies in three areas. Firstly, trust research and especially institutional trust have been recognised but is only now coming to the fore (see Chapter 5 and the work of Bachmann and Inkpen specifically). Providing a case environment in which trust plays such an important role like in the produce sector offers unique insights into how trust is structured in institutional contexts. Secondly, the area of self-service technologies are still new and the establishment of institutional factors as part of planning and design contributes to our knowledge of these technologies. Lastly as far as the industry itself is concerned, South African markets are not the focus of research and this study contributes to the body of knowledge surrounding markets of this nature and specifically their functioning.

- *So what? Will the theory likely change the practice of organizational science in this area?*

The research does point to a new field of research where the facilitation of trust via SST is the core focus. Self-service technologies need a broader social approach and this thesis contributes towards that debate. Governance structures that traditionally catered for organisational matters are not sufficient to address self-service directly. One of the main criticisms against self-service approaches is the one-dimensional and transactional approach ignoring social issues like trust. This is not a reference to social media research, or adoption of technology but reference to the structuring effect of technology in creating and sustaining trusting relationships.

- *Why so? Are the underlying logic and supporting evidence compelling? Are the author's assumptions explicit? Are the author's views believable?*

The research follows a structured process. Whether the underlying logic and evidence is compelling is

always open to some level of interpretation but a significant effort was made to contextualise the case environment and ground it in practical operational context. The underlying assumptions and demarcation are stated explicit as part of the research question, supporting questions and objectives. Supporting articles were published as part of the research journey in recognised peer review journals and conferences.

- *Well done? Does the paper reflect seasoned thinking, conveying completeness and thoroughness? Are multiple theoretical elements (What, How, Why, When, Where, Who) covered, giving the paper a conceptually well-rounded, rather than a superficial, quality?*

The theoretical section of the thesis comprises Chapters 2 – 6 and all attempts were made to ground the discussions within an academic context using published literature. That would include theories such as structuration to which Chapter 3 is dedicated. The ATLAS.ti tool was used to analyse the empirical data. This allowed for a more rigorous interpretation of the data.

- *Done well? Is the paper well written? Does it flow logically? Are the central ideas easily accessed? Is it enjoyable to read? Is the paper long enough to cover the subject but short enough to be interesting?*

All attempts were made to present the thesis in an easy reading style. The thesis was edited by professional language editors and a significant effort was made to prepare the final manuscript in a style that allows for easy navigation.

- *Why now? Is this topic of contemporary interest to scholars in this area? Will it likely advance current discussions, stimulate new discussions or revitalize old discussions?*

As discussed in Chapter 1, the topic of food security is a very topical subject. Hand-in-hand with food security flow the ability to market food effectively. Evidence of how topical this is can be found in the response to local food safety strategies of border countries that have implemented the South African model of fresh produce markets (Namibia, 2013, Namibia 2015, Namfresh 2013).

- *Who cares? What percentage of academic readers are interested in this topic? A paper may be technically adequate but inherently uninteresting to most of our broad audience.*

The answer is left to the reader. Whether a paper/thesis is interesting is a matter of taste.

- *Was sufficient information provided about the research method and process? (Myers, 1997)*

Chapter 2 is dedicated to the research methodology in which all aspects of the research strategy is discussed. This includes the philosophical stance of the author.

The above frameworks were employed to assist with the objective reflection on the research presented. Reflection and valuation of the contribution of the research involves a fair amount of subjectivity from both the author and from the reader. Being in a position to answer the question in an honest manner provides assurance to the author that the reader should extract a certain level of value from this thesis.

12.3.5 Framework 4 - Atkins and Sampson (2002)

The framework of Atkins and Sampson (2002) are used to evaluate the use of a single case study. Table 12.1 provides an evaluation of the case study itself within the context of the above discussions.

Table 12.1: Evaluation criteria for a single case study
Source: Atkins and Sampson (2002)

Element	Evaluation criteria	Response
Way of thinking	Is a creditable argument for the why the single case study is appropriate?	Yes, the argument is presented in Chapter 1 and 2.
	Are the philosophical stance and perspective stated?	Yes, see Chapter 2.
	Is there evidence that any bias is taken into account when performing data analysis?	Yes, there is an explicit recognition of potential bias, interpretation occurs against a theoretical backdrop.
Way of controlling	Have the criteria for analysis been confirmed by an independent researcher?	
	Have any opportunities for various forms of triangulation been exploited?	Yes, extensive use of literature, both academic and industry specific, were consulted.
	Is the research process auditable?	Yes, the research process was outlined in detail and full transcripts of interviews and an extensive defence listing is available.

	Has relevant literature been used to support the selection of an appropriate theoretical framework to guide the research?	Yes, Chapter 3 was devoted to the literature supporting the theoretical framework.
	Does the study use appropriate theory to support the findings?	Yes, the development of the framework is grounded in the theory. A summary of the various conclusions are presented as a roadmap.
	Does the study describe how the conclusions were arrived at and how they are justified by the results?	Yes, this is presented in Chapter 11.
	Are assertions / conclusions made well-grounded in the data?	Yes, the data forms the basis for the formulation of the framework. The data is discussed in length.
Way of working	Are the criteria used to select the appropriate case and participants clearly described?	Yes, the background to the case environment is discussed at length, specifically with Chapters 7-9.
	Does the study provide a clearly formulated question describing an important IS issue?	Yes, the justification and evaluation of the question is provided in Chapters 1 and 12 respectively.
	Are the approaches and techniques for data collection and analysis described in detail?	Yes, the approach is discussed in Chapter 2.
	Is the conceptual framework for the research explicitly described?	Yes, the approach and execution is done based on available frameworks.
Way of supporting	Does the study describe an orderly process for the collection of data?	Yes, the introduction to Chapter 11 describes the process and background to the approach.
	Does the study describe and employ a systematic way to analyse the data?	Yes, the analysis of the data followed a systematic way and ATLAS.ti tool was used to provide a structured approach to the analysis.
	Is the history and context of the research clearly described?	Yes, effort was made to provide a thorough background to the research environment.

Way of communicating	Are the aims and objectives of the study clearly stated?	Yes, Chapter 1 outlines the broader context of the study with specific reference. A roadmap is followed to ensure alignment of the objectives.
	Are limitations to the study acknowledged and described?	Yes, this is done in Chapter 12.
	Does the study suggest if and how the findings might be transferable to other settings?	Yes, the issues surrounding potential transferability are discussed in Chapter 12.
	Is sufficient detail given to allow readers to evaluate the potential transferability of the research to other contexts?	Yes, the study is presented in a sufficient level of detail to identify potential similarities and differences to other environments.
	Does the report identify questions or issues for future research?	Yes, presented in Chapter 12.
	Is the presentation of the research appropriate to the intended audience?	Yes, the social dimension of IS forms the focus of the study and this is in line with the both the academic as well as the commercial audiences.
	Could this research potentially contribute to the work of IS practitioners?	Yes, there is a rich set of empirical data available as well as an overview of the literature specifically trust literature. In addition, the conceptual framework summarises key issues in the process.
	Does the research provide new insights into some aspect of IS work?	Yes, specifically within the context of high trust environments.
	Is the research presented in such a way that there is evidence of logical rigour throughout the study?	Yes, using both a combination of theory and frameworks from the literature, the research follows a clear roadmap addressing the stages of a research project.
	Does the study place the findings in the context of IS practice?	Yes, the context of the case environment is the technology used on markets.

	Does the study place the findings in the context of IS research?	Yes, the findings are grounded in the interaction between user and institution via
	Is the research process open to scrutiny?	Yes, the process is fully transparent and all material is available.

12.3.6 Research process

Myers (1997) suggests that the level of background of the research process is an important to ensure relevance and quality of the research. Theory needs to be placed in a historical as well as future context (Weick, 1995). An interpretivist approach underpins this study and this was discussed in detail in Chapter 2. A significant portion of the discussion within this thesis were dedicated to research process related background (see Chapter 2, Chapter 4 and Chapter 10 provides a background on the empirical stage of the research study and describes both the method as well as the case environment in detail (read with Chapters 7,8,9).

Interpretive approaches are typically interested in the context surrounding IS (Langston & Goldkuhl, 2008). Embracing qualitative methods implies embracing IS as a social-technical system (Trauth, 2001). This in turn leads one to consider both the internal and external realities of the individual (Bannister, 2005) which requires the unpacking of the context within which these realities are formed. Inevitably this process is a subjective journey that involves the research subject to be part of the process. Following this approach allows for the consideration of both the organizational and technical structures in this case. The theory generated in this study would not have been possible if another methodology was followed as the complexity of markets as institutions does not lend itself to narrow methodological approaches. In future research into markets might feature the more detailed studies building on more holistic research like what is found in this study.

12.3.7 Relevance

Relevance is a measure that could be applied to this study as the resultant framework is grounded in a practical case environment using experiences from interviewees that are active in their fields (Lang, 2003). This is viewed as one of the most important deliverables of a study (Myers, 1997). Yet this is also a dangerous and potentially flawed exercise. Generalisability refers to "… the validity of a theory in a setting different from the one where it was empirically tested and confirmed."(Lee & Baskerville, 2003:221).

But Lee and Baskerville (2003:225) also state that "… induction and generalisation is never fully justified logically" along Hume's truism.

This study is relevant and applicable to the specific industry (South African fresh produce industry) but could also serve a role in other industry settings. The use of structuration as part of the theory allows for the framework to find resonance in other settings.

Relevant and timeous research that narrows the gap between academia and industry is seen as especially valuable (Lang, 2003). Continued research into broader fresh produce market dynamics could provide a practical contribution to the various challenges the industry faces. Understanding the broader context of trust formation and the link between trust and the product dimension could proof to be very valuable and relevant. Not only could this framework be used in the "as is" scenario but also be of value in the "to be" planning of future SST implementations. SST environments requires the careful consideration of the specific institutional environment the self-service technology needs to serve. This study could act as a roadmap for such approaches.

Although the fieldwork focussed on the South African market context the application to other food markets is possible. Chapter 7 indicated similarities between the various food markets, their structures and their business models. The South African markets stand out because the exact same business model is employed on all the commission only markets. Interest has been shown by African countries to adopt this model and this could make this research valuable across a broader geographical area.

12.4 Limitations of study

Theory illuminates certain aspects of a specific case environment but is inevitably incapable of identifying all aspects that might be relevant (Walsham, 2002). This is supported by Kuhn (1970):

> "To be accepted as a paradigm, a theory must seem better that its competitors, but it need not, and in fact never does, explain all the facts with which it can be confronted." (II, p18)

The study itself does have some limitations.

Demarcation of the research to focus on socio-technical topics does introduce certain limitations. SST implementations are technological in nature and the adoption and use of technology is a separate aspect that was not built into the model. Aspects like adoption of technology itself, the type of technology, how

it is designed and implemented are not part of this study. Acceptance of the technology like proposed by the Technology Acceptance Model (Davis, Bagozzi & Warshaw 1989) and the various iterations of it was not employed. Also the structuring effect of technology itself on the organisation and its functioning was excluded. Including technology related aspects specifically focussing on the actor's interaction with technology could add value to this study. This is perhaps the topic for future research.

Another area that could enhance the study is the provision for inter-organisational and inter-actor power relationships as an influence on how systems are used and perceived. Service and service design was also not a key component if the study and the inclusion could enhance the findings.

The selection of the case environment could be a further limitation. Single case studies offers advantages and disadvantages. In this case the case environment represents a series of markets all functioning in exactly the same manner increasing the potential for a broader application of the results. It could have been of value to broaden the empirical approach to involve markets that are not part of the commission system. This might have highlighted other aspects that could influence trust forming behaviour. Added to the current study this could have enriched the findings. Although criticism against single case study research has been levied, this thesis illustrates that using the correct combination of literature, theory and empirical data can unlock a rich collection of issues. These findings challenges our view of markets as institutions due to the limited amount of academic focus on trust and technology's application that exists.

Increasing the sample size would be another method of increasing the value of the study. The interviews were conducted with high-level individuals with extensive experience in their fields. But increasing the sample to include a greater spread of users and managers could offer a much richer data set.

As indicated above and in Chapter 2, the limitations from a methodological perspective is ever present especially using an interpretive approach. Interpretive research is generally criticised on the subjective nature of the methodology and the bias of the researcher and the lack of generalisability of the result. Both the data collection and interpretation of the data involves the constant interaction of the researcher introducing subjectivity. Although this is a common criticism its effect is limited through the use of a well planned research strategy.

12.5 Directions for future research

The field of SST is emerging as an exciting field that offers promise for current, recurring and new research themes. From a technological, development as well as from a service delivery perspective the field stretches across multiple disciplines. Approaching SST from a developmental perspective raises a host of potential research themes. The transformative potential of technology within small scale agriculture is yet to be unlocked. From cultural to technological challenges, basically all aspects of SST usage will benefit from more in depth research efforts. Technology itself is constantly evolving. From networking quality and availability, device capabilities to aspects like digital payment methods, all forming part of the SST landscape of the future. The relationship between the various technological devices and usability, what devices are most suitable for what applications, what services cannot be delivered because of technological challenges? Interface design will be a constant evolving theme as technologies mature or are replaced as the devices evolve to accept biometric inputs, what would the impact be on implementations of SST?

On the level of the individual actor the interaction between the actor and the institution itself still holds potential for future research. Focussing specifically on risk, complexity and uncertainty (Ho & Ko, 2008) could raise complimentary issues relating to trust. How do we deal with trust failure? What are best ways of recovering from failure?

Service research specifically shows promise within SST. Although there exists an extensive body of knowledge focussing on service and service delivery, SST is potentially a new dimension that could challenge our understanding of service eco-systems. How do we structure quality measures and development of quality standards relating to SST? Service and the various adoption issues relating to SST (Meng, Wei & Zhu, 2011) will be an important field because the understanding initial adoption dynamics identifies issues relating to cultural and social issues.

Within the institutional domain the interaction between technology and broader institutional dynamics also offers significant promise. Inter-organisational dynamics and SST could add value to the planning of more integrated solutions. Coordinating autonomous partners without physical interaction can enhance the automisation of service interactions. What are the various mechanisms of contract enforcement, how does SST affect the authority of governance structures; can SST make governance more effective? What institutional structures are most suited for SST implementation and what frameworks can we use (Menard,

2004; Bijman 2006). What is the relationship between spot market pricing and contractual pricing, given the use of technologies (Hobbes, 2001).

Social presence and its influence on social interaction should form another filed for research. As the nature of our interaction changes with technology so does the research possibilities. What is the effect of not having human interaction on the perception of the SST (Fitzsimmons, 2003).

Focusing on specific industries and the use of SST also opens up a host of possibilities. SST applications within fresh produce and for example banking differs considerable. Banking, medical, travel and entertainment receives significant academic attention but other less popular industries could also benefit from SST research. The relationship between providing pure services and services with a physical component needs to be understood. Cultural dimensions will play a significant role especially in the developing world with lower levels of socio-economic means (Wang & Emurian, 2005).

Lastly the fresh produce industry specifically could benefit from more socio-technical research across its various activities. As indicated in Chapter 8, fresh produce supply chains has not benefitted from research into the important fields of technology and social issues like trust.

12.6 Concluding summary

This chapter provides a reflection of the research journey by revisiting the main research question. The discussion around the main and sub research questions revisit particular chapters and demonstrates how the various issues were addressed. An evaluation of the research contribution included the positioning of the research within both academic frameworks as well as the important aspect of practical relevance. It is argued that the relevance of the study addresses not only a topical subject (institutional trust and SST) but also the links into the broader topic of food distribution and marketing related research. Various frameworks were used to evaluate the research contribution.

It is useful to conclude with Galliers and Land (1987):

> "Surely the measure of the success of research in an applied topic such as IS is whether our knowledge has been improved to the extent that this improved knowledge can be applied in practice." (Galliers & Land, 1987:901)

Do we have a better understanding of SST and trust within food spot markets? Did this research study deliver a framework that can be used as a theoretical tool to assist SST related issues within institutional contexts? This chapter argues for a positive response.

APPENDIX

13.1 Appendix A – History of computerisation of markets

An overview of technology on markets and the implementation of computer systems are provided below.

Table 13.1: History of South Africa's Fresh Produce Market Systems
Source: www.freshmarksystems.co.za

2015
After 3 years of development the new BACKOFFICE system is installed in East London.
Dave and Dot celebrate 25 years of service at Freshmark.
2014
Mooketsi regional market opens and installs REFRESH.
Freshmark are awarded Honorary Membership of IMASA.
Revolutionary new Web Services product installed on the Tshwane market.
Freshmark is awarded a 5 year contract with Cape Town market and the market installs REFRESH.
Rietpol regional market opens and installs REFRESH.
2013
Sebata Municipal solutions, a MicroMega Group company acquires a 55% stake in Freshmark Systems.
Witbank and Garden Route Express markets upgrade to the REFRESH system.
October – Freshmark move to new office premises.
Freshmark announced as a finalist for the IITPSA "Employer of the year" award.
2012
Refresh is installed in Mpumalanga, Vereeniging and Klerksdorp
Namibian markets project starts.
Mpumalanga, Vereeniging and Klerksdorp markets upgrade to the REFRESH system.
2011
Refresh is installed in Welkom, Pretoria and Kimberley
Carol Trollip celebrates 20 years with Freshmark
2010
Refresh is installed at East London and Durban
Dave Larkan & Dot Bailey celebrate 20 years with Freshmark
2009
Gabarone market (Botswana) install the Freshmark System
Refresh is installed in Umtata, Bloemfontein and Springs
2008
Appleco becomes the first site running Refresh

2007

Development of project REFRESH begins

Mr Mtheza Buya is appointed as Chairman of the Board

In a BEE transaction Sthathu Equity Investments acquire 30% in Freshmark Systems

2006

Alice Market opens and installs the Freshmark system

BKCOB recognizes Freshmark with a "Long Service Award" for 16 years uninterrupted membership

Phillipi (Cape Town) market opens and installs the Freshmark system

Ugu (Port Shepstone) market opens and installs the Freshmark system

2005

Mpumalanga Market opens and installs the Freshmark System

Freshmark systems is recognized as a Proudly South African company

2004

Freshmark training division opens

Uitenhage market installs the Freshmark system

Umtata market is built and installs the Freshmark system

Freshmark wins the CFI outsourcing contract and opens its Cape Town office

Cape Fresh International outsource the operations and management of the Trading System to Freshmark

2003

Botha Roodt, Marco and Subtropico agents on Jhb market install the Freshmark system.

The Freshmark system is install at 3 new markets in Botswana - Francistown, Bobonong & Shakawe

2002

Co-founder with RSA market agents of Technofresh (Pty) Ltd

2001

FMS opens Johannesburg offices

Sees the introduction of integrated off server applications for market agents: Electronic banking, automated faxing, SMS and Document archiving systems

FMS receives Top Solutions Partner Award for Southern Africa from Raining Data - USA

Dave Larkan presents an ICT paper at the World Union of Wholesale Markets

2000

Founding member Mr Gunther Johannsen retires

George market opens and installs the system

FMS guides each and every client without hassle through the dreaded Y2K

RSA market agents the largest on the Johannesburg market install the Freshmark System. The system is adapted to import data from an Oracle system

In a once off project FMS supplies the IT services for the Daimler-Chrysler recruitment project in East London. In excess of 45000 applications are processed in just 6 weeks.

Management buyout of FMS from iti Holdings

1999

FMS receives award as 3rd best VAR for Pick Systems Africa.

FMS installs the first Linux based system on a market.

North end market in PE installs the system

1998

FMS is bought by iti Holdings and placed in their Agri focused division - Agrihub

Lobatse market in Botswana install the system

Kimberley market installs the system

The South African Excellence Foundation (SAEF) business performance monitoring model is adopted and implementation begins.

Butterworth market opens and installs the system

1996

King Williams Town market opens and installs the system

Dot Bailey becomes a partner.

Move from original rented premises to "Freshmark House"

1995

Pietersburg market opens installs the system

Founding GOLD member of Fresh Produce Marketing Association (FPMA)

1994

Dave Larkan becomes a partner

1993

Pretoria market installs and becomes the biggest market using the system.

Nelspruit market opens and becomes the first private market to install the system.

Witbank market installs the system running it on Universe.

1991

Pietermaritzburg market installs the system.

1990

The East London Market system is converted onto an IBM machine running the Pick RDBMS.

Vereeniging market installs the system

Cape Town market installs the system

Durban market install the system

Dave Larkan & Dot Bailey leaves ELCB to join Gunther at Freshmark Systems.

FMS breaks away from ELCB

Welkom market installs the system.

1989

Klerksdorp market installs the system.

Bloemfontein market installs the system.

1988
Springs market becomes the second market to install the Freshmark solution.
Port Elizabeth market installs the system.
FMS adopts the Pick Post Relational Database Management System (DBMS).
1987
The new improved integration modular market management system is installed at the East London Market
Freshmark Systems C.C. is registered. Continues as a division of ELCB
1986
FMS installs the first IBM running AIX system on a market.
1985
The East London Computer Bureau (ELCB) commissioned to write a control system for the East London Municipal market. The system was developed and installed running on a CLAN machine using the UNIVERSE database model

13.2 Appendix B: Original self-service patent (Piggly Wiggly Variety Store)

Figure 13.100 and Table 13.2 provides the details of the patent granted in 1916 to Clarence Saunders owner of the Piggly Wiggly Variety Store for the concept of self-service.

United States Patent #1,242,872. Self-serving Store. Assigned to Clarence Saunders October 9, 1917

(See: http://michaelwfreem.blogspot.com/2012/10/saunders-basement.html

https://www.google.com/patents/US1242872)

Table 13.2: United States Patent #1,242,872
Source: US (2015)

"To all whom it may concern:
Be it known that I, CLARENCE SAUNDERS, a citizen of the United States, residing at Memphis, Shelby county and State of Tennessee, have invented and discovered certain new and useful Improvements in Self-Serving Stores, of which the following is a specification.
The object of my said invention is to provide a store equipment by which the customer will be enabled to serve himself and, in so doing, will be required to view the entire assortment of goods carried in stock, conveniently and attractively displayed and after selecting the list of goods desired, will be required to pass a checking and paying station at which the goods selected may be billed, packed and settled for before retiring from the store, thus relieving the store of a large proportion of the usual incidental expenses, or overhead charges, required to operate it, all as will be hereinafter more fully described and claimed."
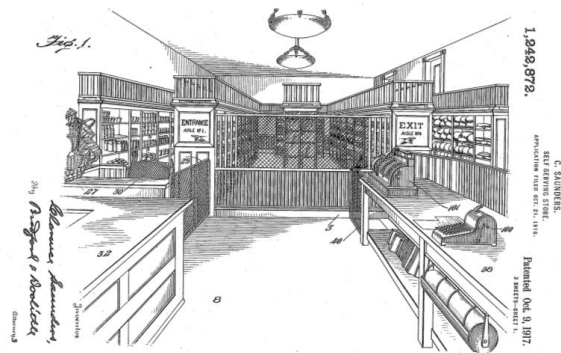
Figure 13.100: United States Patent #1,242,872. Self-serving Store. Source: US (2015)

LIST OF REFERENCES

The primary and secondary references are listed separately. The Harvard method was used for the reference list as well as in text referencing.

The framework is available at: http://www.ais.up.ac.za/eco/referencing.htm

13.3 Primary Sources

A.

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