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3PL	Third-party logistics
4PL	Fourth-party logistics
B2B	Business to Business
B2C	Business to Customers
CO_2	Carbon dioxide
GPS	Global Positioning System
EDI	Electronic data interchange
ERP	Enterprise resource planning
IT	Information technology
JIT	Just-in- time
KPI	Key performance indicator
LSP	Logistics service provider
R&D	Research and development
RFQ	Request for quotation
SC	Supply chain
SCM	Supply chain management
WMS	Web map service
VAS	Value-added service

1 Introduction

This chapter introduces the thesis topic. The background description presents the current practical and research status of the 3PL services area, motivates interest in logistics service offering and identifies unanswered problems regarding value-added services. Based on this, we formulate our study purpose and research questions.

1.1 Background

Third-party logistics and value-added services

Outsourcing of certain functions is a well-established approach for companies to enable a better focus on their own core competences and strategic activities. Many firms in different parts of the supply chain (e.g. manufacturers or retailers) outsource their supply chain-related functions. By contracting supporting functions to specialist companies, the customers achieve a cost reduction and more flexibility in service capacity when market demand changes (Ansari, 2010). These functions are executed by third-party logistics (3PL) providers – logistics specialist firms that take over the responsibility for the outsourced functions and perform the required services. The 3PLs typically establish a long-term relationship with the customers and often tailor their services to the specific customer's needs (Knemeyer et al., 2003).

Certain services, e.g. transport and warehousing, nowadays make up a minimum level of logistics services and are part of most 3PL providers' service offering. However, there is a trend during the recent years that logistics customers are seeking to outsource an increasingly wide range of functions, and the 3PL services have become more advanced and more complex (Lieb, 2015). Today, many 3PLs therefore offer additional value-added services (VAS). These are services that go beyond transport, warehousing, and their immediate support functions. Examples of such services, provided by most of the larger providers, include cross-docking, packaging and labeling, product customization, postponement, end customer support, invoicing, purchasing, etc., (dbschenker.com, 2017) just to name a few. Such services often enable provider differentiation and offer a competitive advantage when a customer selects the provider, as well as increased profitability for the 3PL provider (Anderson, Coltman, Devinney, & Keating, 2011).

State of the 3PL market

The 20th Annual Third-Party Logistics Study (Capgemini, 2016) based on input from hundreds of customers (e.g. shippers) and 3PL providers offers a look at the global 3PL market as reported by the participants themselves. It summarizes the prevailing trend in logistics as

> *…continued collaborative and positive relationships between shippers and third-party logistics providers, [where] 3PLs and their customers are becoming more proficient at what they do, individually as well as together, which is improving the quality of their relationships. (p.6)*

According to the report, 70% of logistics customers and 85% of 3PL providers say that the use of 3PL services has enabled overall logistics cost reductions, and 83% of customers and 94% of 3PL providers say that it has led to improved customer service. Furthermore, the majority of both groups say that 3PLs offer new and innovative ways to improve logistics effectiveness. The volume and reach of the survey makes the study trustworthy as an indicator of general trends in the 3PL market. The extensive use of 3PL and its business-strategic importance for the customers thus serves as an important inspiration for the study.

Relationships between the customers (shippers) and providers (3PL companies) typically have a long-term nature, enabling closer collaboration and a wider span of services that go beyond transport and warehousing. Table 1 (Capgemini, 2016) outlines the range of services offered by the 3PLs and their frequency of use by their customers. The traditional logistics services, transport and warehousing, continue to make up the cornerstone of employing external logistics services, but a wide range of additional services are also contracted by the customers. Diverse shipping support services (e.g. customs brokerage, cross-docking, transportation planning) are contracted by at least a third of the customers, and a significant fraction of the customers also outsource advanced services (e.g. production support, reverse logistics, and logistics consulting).

Outsourced Logistics Services	Percentages of Users	Outsourced Logistics Services	Percentages of Users
Domestic transportation	80%	Inventory management	25%
Warehousing	66%	Product labeling, packaging, assembly, kitting	22%
International transportation	60%	Order management and fulfillment	19%
Freight forwarding	48%	Service parts logistics	12%
Customs brokerage	45%	Fleet management	12%
Reverse logistics (defective, repair, return)	34%	Information technology (IT) services	11%
Cross-docking	33%	Supply chain consultancy	11%
Freight bill auditing and payment	31%	Customer service	7%
Transportation planning and management	28%	LLP / 4PL services	6%

Table 1: Outsourcing Frequency of Logistics Services (Capgemini, 2016, p. 13). Reprinted with permission.

Outsourcing trends

According to the 20th Annual Third-Party Logistics Study (Capgemini, 2016), not only outsourcing but also insourcing is constantly happening – companies shift to managing their previously externally provided logistics functions in-house. In 2016, 35% of shippers report that they are returning to insourcing some of their logistics functions (26% in 2015). But the figure is still significantly lower than the 73% (68% in 2015) of shippers that are increasing their outsourced services. About 50% (44% in 2015) of customers' logistics spending is now related to outsourcing.

The principle that predominantly non-strategic services – transportation, packaging, customs-clearance, etc. – are outsourced is confirmed by the shippers' responses in the survey (Capgemini, 2016):

> *[T]he most frequently outsourced activities continue to be those that are more transactional, operational and repetitive. Activities that are strategic, IT-intensive and customer-facing tend to be outsourced to a lesser extent. (p.6)*

In contrast to traditional outsourcing practices, companies now increasingly let 3PL providers take care of larger parts of their supply chain, sometimes including operations of strategic importance. The motivation again lies in utilizing economies of scale and special competence of the providers (Ansari, 2010). This is the driving force of the advanced 3PL market today.

Another important characteristic of the 3PL field is the broad diversity of service situations. The logistics market is characterized – and complicated – by the fact that there exist a large variety of categories of services, providers, customers, and customer-provider relationships (Soinio, 2012). We will refer to a certain combination of these categories as *a scenario*. The aspects where different categories may be distinguished are service types (e.g. according to Table 1), 3PL provider types (e.g. based on adaptation/problem solving abilities as in Hertz & Alfredsson (2003)), customer types (e.g. according to their logistics competence and the strategic importance of logistics-related operations (Parashkevova, 2007)), and relationship types (e.g. tactical or strategic matching (Stefansson, 2006)). More thorough discussions of these categories will be provided in the theoretical framework chapter.

3PL research status

The subject of 3PL has been studied quite extensively during the last 30 years. A literature study by Selviaridis & Spring (2007) finds that research has been mostly empirical and descriptive in nature, often lacking a solid theoretical foundation. The main topics of interest continue to be outsourcing decisions, benefits and risks, service offerings, 3PL purchasing and marketing, growth and innovation, 3PL relationships and growth factors. Selviaridis & Spring (2007) also point out the need for more normative research, to improve the understanding and develop frameworks for practical outsourcing and service offering decisions by 3PL actors. A literature study by Marasco (2006) also emphasizes the need for a more comprehensive conceptual basis:

> *Further development of the field [of 3PL research] requires greater emphasis on the development of theory, constructs and conceptual frameworks in order to build a conceptual foundation for subsequent empirical studies. (p. 142)*

1.2 Problem Description

Most of the existing research on outsourcing decisions (which services to outsource) and service selection (which 3PL to choose) represents the customer's viewpoint. From the provider's perspective, the corresponding concern is service offering: which services to offer to the customers? The baseline services – transports and warehousing – are a natural choice but numerous additional VAS could be considered. It appears that the area of VAS offering criteria has not been extensively researched and there is no established theoretical foundation. Previous work certainly exists on motivation, development, and barriers for VAS (e.g. Soinio et al., 2012; Atkacuna & Furlan, 2009). However, we have not found treatments of prerequisites or feasibility of different services in different customer and market scenarios.

As in any service provision situation, the standard answer to the question "Which services to offer?" could be to offer those services that the customer requests. (Murphy & Poist, 2000). But as already mentioned, the range of different types of VASs is broad, with varying

prerequisites and revenue potential. There exist different ways to develop such services – re-actively or pro-actively, as a general market offering or customer-specifically, etc. (Cui, Hertz, & Su, 2010). The 3PL providers differ in their core competences, size, customer relations, extent of supply chain integration, etc. (Hertz & Alfredsson, 2003), and customers vary regarding their supply chain role and their logistics competences (Murphy et al., 2000). Expectedly, certain barriers preclude that all 3PL providers, even small-to-medium firms, could efficiently provide any one of the many possible additional services (Atkacuna & Furlan, 2009).

Therefore, the service offering decision is not necessarily just a question of following the customer's desires. What if the provider has no existing capability – should they develop it? If the capability exists, but providing the service means extensive customization, is that effort justified? It is financially efficient compared to the customer performing it internally? What if the customer does not know what they really need?

One way to identify relevant research areas is to apply the gap-spotting strategy (Sandberg & Alvesson, 2010) – recognizing overlooked areas not yet covered by literature to formulate new specific research questions. Using this approach, we realize that there is a need for a closer look at how a 3PL identifies which services to offer to a customer. To fill a gap in the existing research and follow the recommendation to create normative, conceptual descriptions, it is desirable to systematically characterize how the scenario – a certain type of 3PL provider, customer, and their relationship – affects the service offering process and decisions. The task may be approached relying on existing theory on customer value creation, service strategies, and service innovation elements as seen by the provider. We therefore recognize a need for conceptualizing the subject of VAS offering and development decisions by 3PL providers.

1.3 Purpose and Research Questions

From the problem description, the purpose of the study can be defined:

Develop an understanding of how a 3PL determines which value-added services or service customizations can be favorable, and which customer-supplier relationships and service development strategies should be pursued, depending on the logistics scenario at hand.

The scenario can be defined based on the type of 3PL provider and their service strategies, the type of customer and their SC role or in-house logistics skills, the 3PL relationship type, the industry segment, etc.

To pursue the formulated purpose, we define the following research questions from the 3PL provider perspective:

RQ1: Which are the main criteria for VAS or service customizations offering decisions?

RQ2: Which types of VAS or service customizations are relevant to offer for different combinations of 3PL provider and customer categories?

RQ3: How do provider-customer relationships and service innovation strategies depend on the VAS types offered by the 3PL providers?

1.4 Delimitation

The 3PL market is global and 3PL providers may operate worldwide, with service offering patterns and customer relations depending on the region of operation. In this thesis, we limit the study to 3PL providers and customers in Sweden and other Nordic countries. The Nordic region was chosen to extend the set of companies for data collection beyond Sweden, while still investigating a region that is homogeneous culturally and business process-wise. We also limited the thesis to qualitative methodology to generate valid results even when statistically representative sampling cannot be ensured.

1.5 Disposition of the thesis

This thesis is structured as follows. In this first chapter, we present a contextual *background* to introduce the 3PL topic, motivate further study of the VAS and identify a research gap, and formulate the *objectives of the thesis*. Following the background and the purpose, the second chapter elaborates on the *theoretical frame of reference* that provides the required theoretical basis for analyzing empirical data and formulating the desired framework. We will cover Porter's value chain and strategy theories and link them to numerous topics related to 3PL and VAS. The third chapter will cover the *research methodology* used in the study, justifying and describing the approach and measures related to research quality and ethics. The fourth chapter presents the *empirical results* from our interactions with 3PL providers and customers. The fifth chapter presents the *analysis of the data* in light of the theoretical frame of reference and formulates the new insights and a framework for VAS offering that are the main purpose of the thesis. Finally, chapter six *concludes* by outlining the contributions of the work and further research directions.

2 Theoretical frame of reference

This chapter presents existing theories in areas that will be used to analyze the data and develop the improved understanding and the framework. It also shows the interconnections between various concepts and covers principles of theory and framework development.

2.1 Introduction

To form the theoretical framework for analyzing the research questions about 3PL service offering, we build on numerous existing logistics and relationships theories. Previous 3PL theory development has largely relied on network approach which captures key aspects of interconnectedness and relationships of the supply chain actors (e.g. Hertz & Alfredsson, 2003). However, in this study where value creation for the customer is a key element in VAS offering decisions by the providers, we have chosen to build upon on the value chain theory (Porter, 1985) and related generic strategies principles.

We start by presenting Porter's framework for finding and utilizing stages in the process flow where significant customer value is created. We then introduce value creation thinking from the 3PL customer perspective – what motivates the customer and leads to outsourcing certain services, how the customer perceives value, the main criteria for selecting service providers and for 3PL relationship development. This provides an understanding of customer expectations that a provider must satisfy.

Next, we shift to the 3PL provider view. 3PL basics and aspects of service offering and development, core competences, and service customization are covered. Central parts of the discussion are the different 3PL provider types and roles, as well as different VAS types. We also give and overview of success factors and competitive advantage creation. Service offering is also a business development decision, so theory on 3PL strategies and service development and innovation will be invoked.

The two perspectives are combined in the 3PL relationship topic. For the purposes of later creating the understanding of VAS offering decisions, we introduce the notion of logistics scenarios, defined using customer, provider, and relationship type dimensions introduced earlier. We end the chapter by presenting general principles for theory and framework development.

2.2 The value chain and the value system

The term *value chain* was introduced in Michael Porter's book "Competitive Advantage: Creating and Sustaining Superior Performance" (Porter, 1985). Value chain analysis identifies individual activities within and around an organization and relates them to the organization's competitive strengths. It characterizes the value that each activity adds to the organizations products or services. An organization is more than a random compilation of resources, but the resources must be systematically arranged to produce something for which customers are willing to pay.

The value chain representation allows isolating particular activities in the company's operations in order to understand how to translate the activities into a strategic advantage. The value chain of Porter (1985) is represented in Figure 1.

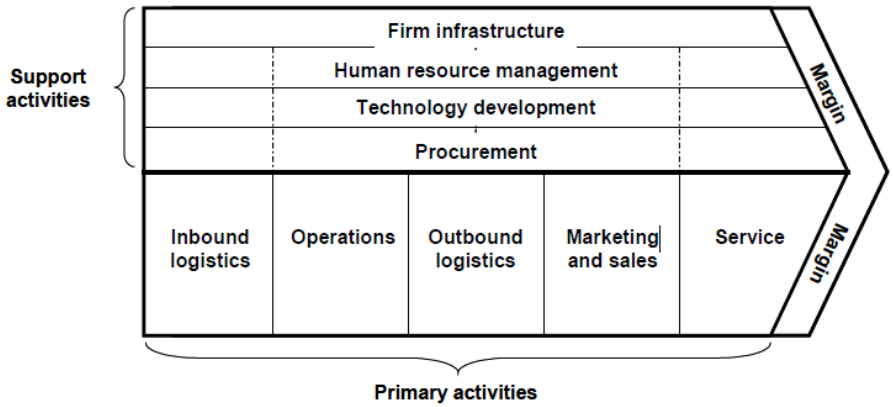

Figure 1: The Value Chain (Porter, 1985, p. 37).

According to Porter (1985), the ability to perform particular activities and to manage the linkages between them creates a competitive advantage. Porter distinguishes between primary activities and support activities. Primary activities are directly related to creating or delivering a product or a service: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each primary activity is linked to support activities which enable them or improve their efficiency. The support activities identified by Porter are procurement, technology development (including R&D), human resource management, and infrastructure for planning, finance, quality, information management etc. The profit margin is created when the total cost of performing the activities is lower than the value that the customer is willing to pay for the product.

An important extension of this theory is the *value system*. The value chain thinking may be applied to a network of organizations or a product flow between them (Porter, 1985). The value chain of a particular company is part of the supply chain value system; the system also includes value chains of other actors in the system. Within the whole value system, only a certain amount of profit margin is available – the difference of the price the customer pays for the final product and the aggregated costs during production and delivery of the product/service. How the margin spreads across the actors of the value system depends on its structure. Each actor in the system tries to use its market position and abilities to get as high a proportion of this margin as possible.

A value chain or value system thinking may also help identify stages in the supply chain with potential for extra value creation (Cox, 1999). A value chain analysis may include the steps of analysis of own value chain and costs of every activity, analysis of customer's value chains and how the organization's product fits into their value chain, identification of potential cost advantages, and identification of potential added value for the customer (e.g. lower costs or higher performance) (Taylor, 2005). The importance of the value chain model for logistics companies lies in illuminating the opportunity to both provide improved service and do it at a lower cost – a combination that historically was considered contradictory (Cox, 1999).

2.3 Generic business strategies

In this thesis, we adopt the positioning theory viewpoint (Porter, 1980) for strategy considerations. The company's environment is taken as a given and the firm should formulate a strategy that provides a competitive advantage and enables successful competition in the given environment. The environment is characterized by five competitive forces – threat of new entrants, bargaining power of buyers, threat of substitute products or services, bargaining power of suppliers, and rivalry among existing firms. These determine the attractiveness of the industry and must be considered when selecting a strategy.

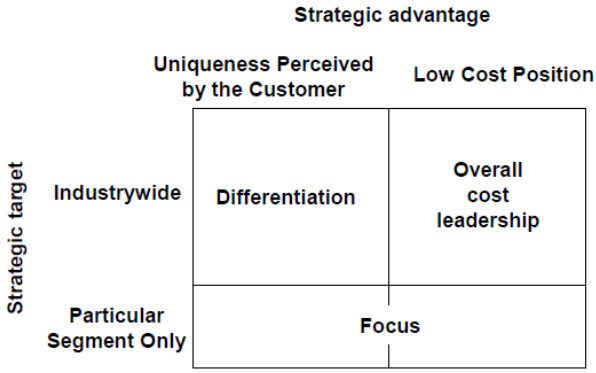

Figure 2: Generic Strategies. (Porter, 1980, p. 39).

The generic strategy view (Porter, 1980), depicted in Figure 2, says that long-term industry-wide competitive advantage can be obtained from either product/service differentiation or cost leadership. These principles can also be focused to a specific market segment by concentrating on particular niche markets. By understanding the dynamics of that market and the unique needs of customers, the company can add something extra as a result of serving only that market niche.

The cost leadership strategy aims to minimize the organization's total cost of delivering products and services to the customer. It relies on access to the capital for technology investments that will bring down costs, efficient logistics, and low-cost labor, materials, and facilities, to sustainably cut costs below the competitors. This strategy can be used to increase profits by reducing costs while charging average prices, or to increase market share by charging lower prices while still making a profit because of low internal costs (Lovelock & Wirtz, 2007).

The differentiation strategy, on the other hand, involves making the company's products or services different and more attractive compared to competitors. It may include special features, functionality, and support, but also a brand image appreciated by the customers. Successful differentiation requires innovation, the ability to deliver high-quality products or services, and effective marketing that communicates the benefits of the differentiated offerings. Such organizations need agile product development to avoid attacks from competitors (Lovelock & Wirtz, 2007).

The choice of which generic strategy to pursue affects other strategic decisions of the company. A clear decision is necessary: Porter (1980) warns against trying to "hedge your bets" by following more than one strategy. The abilities needed to make each type of strategy work are not cooperative and may even be contradictory. Cost leadership requires a very

detailed internal focus on processes, while differentiation necessitates an outward-facing, highly creative approach.

The five competitive forces describe the industry-level situation and allow formulating high-level generic strategies. However, practical execution of a strategy translates to performing specific activities. Such activities may be presented in the context of a value chain of the company (Porter, 1985) introduced above.

2.4 Logistics customer perspective

2.4.1 Outsourcing

Outsourcing is not a new concept. It has been known since the 1960s and, according to the formulation by Sanders, Locke, Moore and Autry (2007), refers to a situation where an outside supplier is contracted to perform a task, function or process, so that the customer can gain business-level benefits. It is an umbrella term that covers many external sourcing options. It can entail contracting a single task to an external actor in *out-tasking*, a partial function with a larger scope as *co-managed services*, or letting the provider take responsibility for an entire function in a *managed services* solution (Sanders et al., 2007).

Outsourcing is typically applied when it is likely that a service provider company can perform the tasks more efficiently, provide higher quality according to some metric, or when the customer lacks the required competence and is unable or unwilling to develop them (Scott, Lundgren & Thompson, 2011). The service provider can usually take advantage of economies of scale and its core competences, and thus offer the service both at a lower cost and with higher quality.

Outsourcing has become a megatrend in the logistics and SCM services area (Sanders et al., 2007). Frequent reasons for using logistics outsourcing are increased operational flexibility, reduction in fixed assets and operating costs, risk sharing, access to broader resources, and increased efficiency. Outsourcing replaces fixed costs with variable costs (Persson & Virum, 2001). A good example of the benefits is not having to address seasonal demand swings or adapt to changes in transport infrastructure. By avoiding transport-related investments, the customer firm can better focus on its core activities.

But outsourcing also creates challenges and risks for the customer company. The provider may not be able to guarantee the same service or product quality, especially if the provider selection has been made based on cost (Kaya & Özer, 2009). Wang and Regan (2003) have outlined several potential risks and barriers in 3PL outsourcing scenarios: inefficient management, latent information asymmetry, loss of innovative capacity, hidden costs, excessive dependence on the 3PL provider, loss of control over the functionality, evaluation and monitoring difficulties, and conflicts of the partnering firms' cultures. All these aspects need to be considered when making outsourcing decisions. One common misconceptions by the customers is that low cost and high service quality coexist as a rule (Szymankiewicz, 1994). For successfully outsourcing, costs should be viewed as a qualifying factor, not a predominant decision factor.

2.4.2 Towards outsourcing more advanced services

In addition to the scope of activities, the strategic importance of a logistics function for the company is an important criterion for whether or not to outsource it. Since effective logistics solutions increasingly depend on the 3PL providers' performance, the integrator function of the provider plays an important role, connecting different information flows that relate to goods delivery (Aktas & Ulengin, 2005). Therefore, companies also may outsource parts of their activities that traditionally constitute critical success factors. The motivation may be the cost, but also the ability for the 3PL provider to take over entire functions of the customer's logistics operations, e.g. purchasing or returns handling (Bolumole, 2001).

Soinio (2012) states that the core service of logistics is transportation and storage of goods – without the need for it, there would not be a demand for the value-added services. However, once the transportation and warehousing need arises, numerous additional operations and functions emerge that may cause considerable complications and expenses to the customer company. Table 1 provides one possible categorization of such functions performed in close conjunction to transport. (Additional classifications exist, as will be covered later.) Depending on the scenario, all those may be candidates for outsourcing. As customers seek increasing cost efficiency, there is a trend towards a widening range of additional services – support for lean production, postponement and assembly, IT services and supply chain planning have been introduced as services during the recent years (Lieb, 2015).

2.4.3 Logistics services selection

The service selection decision contains two aspects. One is analysis of which services could and should be outsourced, the other is selection of the provider to contract to perform them.

The choice of outsourcing depends, among other things, on the desired scope and strategic importance of the logistics function, which in turn depends on the customer's business. Logistics customers are found at all stages of the supply chain, from manufacturers upstream to retailers downstream, each with their actor-specific needs. They also differ in terms of their own logistics competence and the strategic importance of their logistics-related operations (Parashkevova, 2007) in the total operations of the firm. A useful classification of customers' logistics choices is given by Bolumole (2001). Depending on the importance of logistics in the industry and the customer's in-house logistics competence, the framework (Figure 3) indicates whether the customer should perform it in-house, spin off its logistics know-how, outsource the logistics function, or outsource certain functions while maintaining control of the process (Bolumole, 2001).

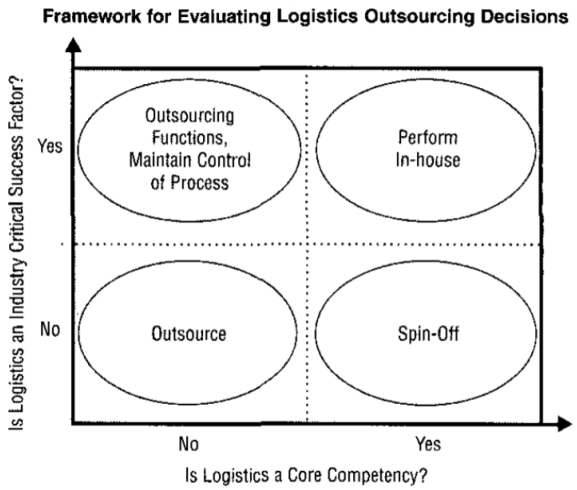

Figure 3: Logistics Outsourcing Decision Strategies. (Bolumole, 2001, p. 91).

The choice of provider is also a critical one. If a strategic alliance is desired, the decision has long-term consequences to the customer's performance in its value chain (Lee & Cavusgil 2006). Partner compatibility, matching expectations, and compatible objectives are critical for having a reasonable success probability. On the operational level, transport mode choice and carrier selection, but also cost and service quality, reliability, flexibility, and responsiveness of the offering must match customer needs (Selviaridis and Spring, 2007). Vaidyanathan (2005, p. 93) has compiled a comprehensive list of selection criteria in categories of cost, quality, service quality, IT capabilities, performance, and intangibles of the provider company.

2.5 Logistics provider perspective

2.5.1 Service concept

The concept of service provision may be defined in several ways. Grönroos (2000) defines it by formulating what the provider intends to provide to the target customer segment, how this will be achieved, and which resources will be used. The service may also be defined via the strategic, tactical, and operations levels that it is based on (Kasper et al., 2006). Strategically, for the service to be commercially feasible, the company needs to establish how to translate the desired and anticipated user benefits into a profitable service. Tactically, customer value is maximized by proper service packaging. Finally, at the operational level, the service offer details are tuned to meet the specific customer expectations (Kasper et al., 2006).

In many cases, the outsourcing service offering is divided into basic and augmented service packages (Grönroos, 2000). The basic services constitute core functions – the reason why the provider company is in the market in the first place. Core service is also defined as *"the central component that supplies the principal, problem solving benefits customer seek"* (Lovelock and Wirtz, 2007, p. 70).

Core services are commonly accompanied by supplementary (facilitating and augmenting) services (Lovelock and Wirtz, 2007). Facilitating services either assist the usage of the underlying basic service or may even be required for its provision. In contrast, the augmenting or supporting services add value to the core service and help distinguish it from competing offerings. Supplementary services are often required to make the entire service offering

attractive to the customer. Grönroos (2000) adds that, in addition to the core service, the offering must also guarantee accessibility and opportunities for customer participation and interaction with service organization.

Tightly connected to the service concept is the notion of service quality. It is the main prerequisite for customer loyalty (Wallenburg, 2009). Kasper et al. (2006) outlines reliability – performing the service with accuracy and without failures – as the most important quality aspect, followed by responsiveness, guarantees, and empathy. These soft characteristics of customer-provider interaction are important service quality criteria, and thereby customer satisfaction prerequisites. Tangible logistics metrics like cost, speed, accuracy, etc. are of course also important (Kasper et al., 2006).

2.5.2 3PL concept

Before proceeding to discuss other 3PL aspects, we begin by clarifying the distinction between traditional logistics service providers (LSP) and third-party logistics (3PL) providers. A fairly general definition of LSP is given by Delfmann, Albers and Gehring (2002) as companies which perform logistics activities on behalf of others. This covers freight forwarders, transformers, niche providers, and full LSPs according to the categorization by Lai (2004), or standardizing, bundling, and customizing LSPs according to Delfmann et al. (2002). LSPs may also be categorized according to how asset-specific they are and how complex services they can offer. This categorization according to Persson & Virum (2001) is depicted in Figure 4.

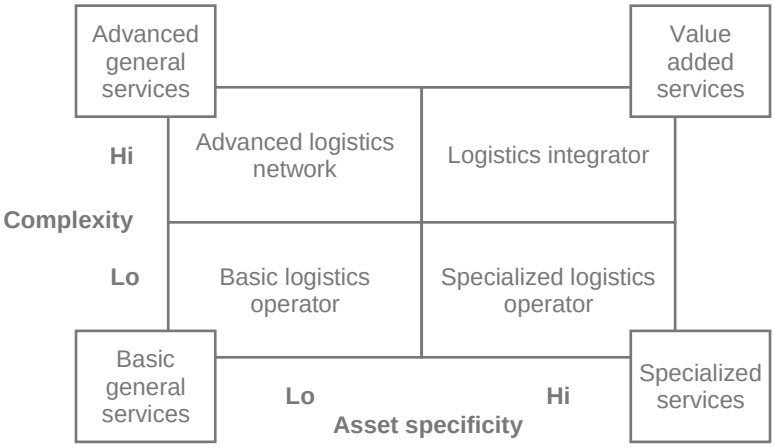

Figure 4: Categorization of LSPs (Persson & Virum, 2001, p. 60).

3PLs are a particular class of LSPs that may be defined as proposed by Skjott-Larsen et al. (2003, p.10):

> *"Third-party logistics are activities carried out by an external company on behalf of a [customer] and consisting of at least the provision of management of multiple logistics services. These activities are offered in an integrated way, not on stand-alone basis. The co-operation between the shipper and the external company is an intended continuous relationship".*

A common additional requirement is that the collaboration should not be extremely short-term and the outsourcing agreement should contain elements of design, planning, or management activities (van Laarhoven et al., 2000). This distinguishes 3PLs from regular LSPs that often operate with short-term contracts, often in arm's length-relationships.

2.5.3 3PL provider categories

Not all 3PL providers are capable of offering all possible services. Different types of 3PL may be distinguished according to several possible classifications.

One well-established categorization is based on adaptation and problem-solving abilities of the provider, proposed by Hertz and Alfredsson (2003). At one level, LSPs can be divided into four categories, including baseline transport or warehousing providers with low dynamic abilities, integrators and freight forwarders with standard services but high problem-solving capabilities, and finally 3PL firms that offer both dynamic flexibility and customizability. This is illustrated in Figure 5, left-hand side.

The 3PL group can subsequently further be divided into four quadrants according to the same criteria, as shown in Figure 5, right-hand side:

- The lower left quadrant represents *standard 3PLs* that predominantly provide basic transport and warehousing services.

- The upper-left quadrant contains *service developer 3PLs* that can provide different specialized services to different customers. They form service packages by combining standard functional modules to meet the expectations of the customer. This is a way to provide some customization while still taking advantage of economies of scale and scope. Tight integration with the customer is often not required.

- The lower-right quadrant represents the *customer adapter* group where customized solutions are designed for each customer, sometimes even for basic services. The provider is closely collaborating with the customer's organization, often at relatively lower volumes.

- Finally, the upper-right quadrant contains the *customer developer* category that, in addition to the customer adapter features, also provides consulting and planning functions to the customer. This is the most advanced 3PL category.

An alternative classification, based on customization ability and the scope of activities, is presented by Stefansson (2006). This classification is applicable to a broader class of LSPs, not only the 3PL. Figure 6 illustrates that it is challenging to simultaneously provide a broad scope of services and customizability. Most LSPs focus either on providing many services in a relatively standard configuration (corresponding to quadrant 1 in Figure 5) or fewer service types that can be heavily customized (as quadrant 4 in Figure 5).

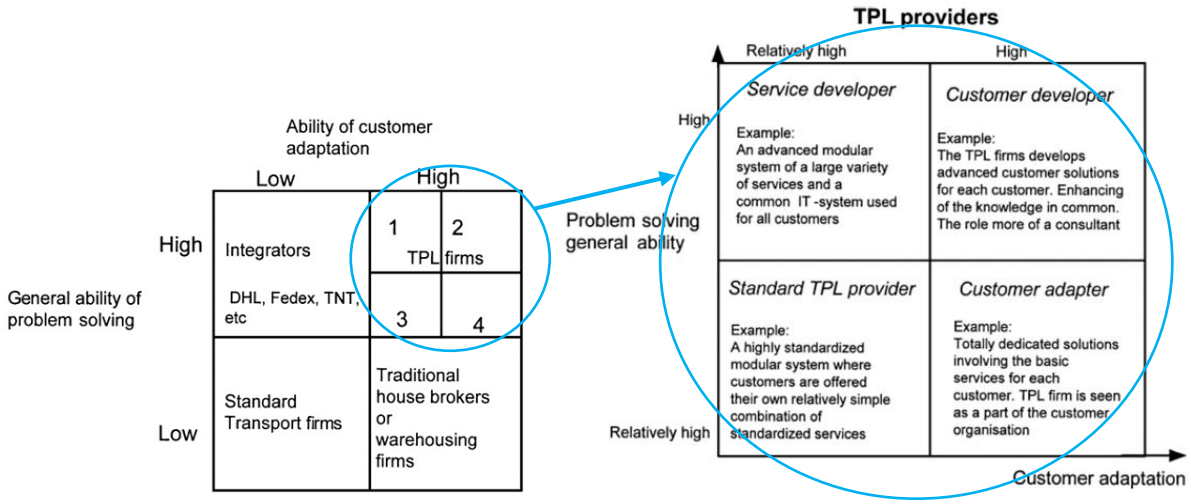

Figure 5: Categorization of LSPs and 3PLs (Hertz & Alfredsson, 2003, p. 141).

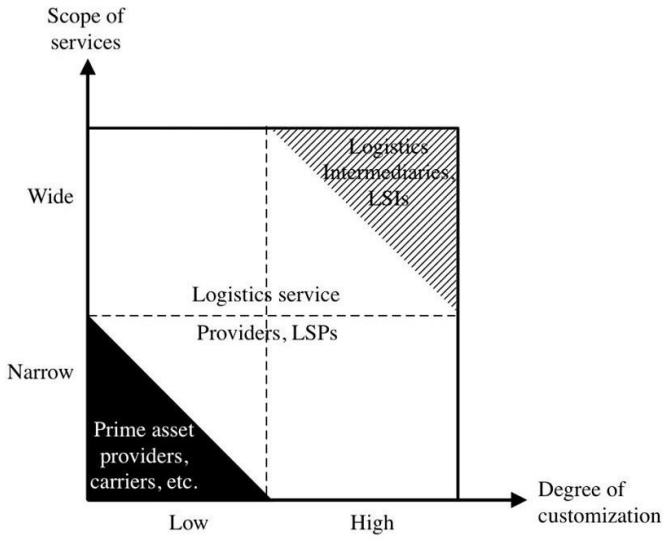

Figure 6: Customization of Third-Party Services (Stefansson, 2006, p. 89).

A special class of LSPs, the intermediaries, have the capability to provide both broad scope and high customizability. This corresponds to the upper-right corner of Figure 6. However, these providers do it usually by combining resources from their service network, not by using own assets. The LSIs often have no contact with the physical goods flow, they only manage the information and order flow with their service providers to fulfill the customer's tasks.

The LSI of Stefansson (2006), as well as the customer developer of Hertz and Alfredsson (2003), constitute a separate provider class, fourth-party logistics provider (4PL). They often act as asset-less consultants, managers, and controllers that take over other firms' logistics functions. Rather than providing physical transportation and handling services themselves, a

4PL acts as a middleman who manages the logistics function by hiring transporters and developing the supply chain structure (Lumsden, 2012).

These are not the only possible classifications. 3PL may additionally be categorized according to their assets/complexity trade-offs as described by Persson & Virum (2001), see Figure 4, and more classifications exist.

2.5.4 3PL service classification

As already mentioned above, the generic service concept distinguishes between basic and augmented service types (Grönroos, 2000). We will see that this also applies in the 3PL context. There are basic services that are expected to be provided by all 3PLs, and facilitating and supporting services whose offerings depend on the specific 3PL provider (Meier & Andersson, 2003).

One categorization of 3PL services (Bask, 2001) includes three categories. Routine 3PL services require no customization and focus on price and reliability (e.g. basic transport and warehousing). Standardized 3PL services include simple customization and require moderate cooperation (e.g. sorting and terminal service, or cold chains). Customized 3PL services presume closer cooperation and information exchange and the services are closely integrated with customer's operations (e.g. postponement and after-sales service).

In the framework of Meier and Andersson (2003), seven service groups have been distinguished (in the order from most to least common):

- transport planning and management
- warehousing and inventory management (e.g. storage, order picking)
- information technology services (e.g. tracking, order booking, analysis)
- forwarding and customs activities
- product related services (e.g. labeling, product assembly)
- consulting
- financial services.

Yet another way to categorize 3PL services is relation to physical goods flow (Delfmann et al., 2002):

1. Core processes in transportation (shipping, forwarding) and warehousing (handling, packaging, etc.)
2. Added-value activities e.g. in production (assembly, labeling, postponement) and IT (forecasting, tracking, scheduling)
3. Management and support tools (project control, consulting, EDI)
4. Financial services (factoring, invoicing, insurance)

In this classification, items 2-4 can be viewed as additional services.

There exist numerous additional classifications. Most of them include core services that are necessary for the 3PL to operate in the logistics market, as well as additional services with higher margins that differentiate the providers and offer competitive advantages. This thesis study focuses on the additional services group.

The different service categories are also discussed by Berglund (2000). Their study distinguishes core competencies of full logistics offerings, functional activity warehousing services, functional activity transportation services, logistics IT services, different value-adding services, and consultative or design/engineering services. For some 3PLs, their core competence is a VAS-type service group. However, in most cases, the traditional functions dominate, e.g. warehousing and transporting.

2.5.5 Value-added services

As with many logistics concepts, there is no single unanimous definition of VAS. According to some authors, most additional services above the basic services (transports and warehousing) and standard facilitating functions (inventory and shipment tracking, standard documentation handling) can be viewed as VAS. One such formulation is offered by Berglund (2000, p. 83) who states that VASs are *"services that add extra features, form, or function to the basic service"*.

Bowersox and Closs (1996) assume a narrower view and use the VAS notion for additional services that are customized to specific customers' requirements. The firm is thus performing unique actions to provide value to individual customers. They find that specialized, unique solutions drive the demand for 3PLs who can provide such value-added operations. According to Bowersox and Closs (1996), value-added services may be divided by into five primary performance areas:

- *Customer-focused* VAS constitute alternative ways for third-party specialists to distribute products, e.g. direct store delivery or home delivery. Picking, packing and repacking services are also common to enable distribution of a standard product in unique configurations selected by receiver.

- *Promotion-focused* VAS involve making of point-of-sale displays and other services whose purpose is to stimulate sales. Point-of-sale displays can also combine products from different suppliers in one display for a particular store. Often gifts and related promotion materials are handled and shipped by the provider.

- *Manufacturing-focused* VAS are mainly postponement activities that delay product finalization until the exact customer order is known. The costs of such operations by outside providers can be higher than incorporating them in the original manufacturing process. But the reduced risk of producing products that lack demand can be very advantageous.

- *Time-focused* VAS are services where providers sort, mix and sequence inventory before it is delivered to manufacturing facilities. Just-in-time deliveries to factories are popular services of this type. This reduces handling and inspections performed at manufacturer's site and removes unnecessary work.

- *Basic services* can be e.g. outsourcing a firm's basic customer service. There are wide range of such services available, like order processing, inventory management, reverse logistics, and invoicing. Many providers also offer extensive logistics service packages.

The Bowersox and Closs (1996) view of VAS is also in line with Van Hoek (2000) who emphasizes that customized VAS will necessarily have lower transaction frequency than the basic services – customer-specific adaptation is needed to provide the value that the particular customer seeks. He also finds that, despite their potential, such services are not yet common for mainstream 3PLs due to their perceived lack of manufacturing or marketing competence. This may be partially explained by the mismatch mentioned by Selviaridis and Spring (2007): customers are not yet ready to purchase the IT, production, and administrative VAS that some providers are offering. Customers view these functions as strategically too important to outsource and underestimate the competence of the 3PLs in these areas. As long as such mindset persists, the progress towards wider VAS outsourcing may be slower than it otherwise could be. The same insight is expressed by Soinio (2010).

Other VAS classifications also exist. As an example, Vaidyanathan (2005) provides a quite extensive categorization of non-standard services in different functional areas. It is presented in Appendix 4.

For the rest of the study, we will work with the list of 3PL service categories presented in Table 2, developed further from Meier and Andersson (2003). Transport and warehousing services are standard services that are not included as VAS.

VAS type	Example services
IT	tracking, transparency, order booking, self-service access, flow analysis
Product-related	product assembly, postponement, labeling, packaging, just-in-time support
Customer-focused	direct delivery, cross-docking
E-commerce	payment platform
Promotional	point-of-sale displays, promotional materials, telemarketing
Reverse logistics	Repair, recycling
Administrative	purchasing, order processing, invoicing, export/import, customs brokerage
Customer service	Phone support
Consulting	Supply chain optimization
Financial	Stock ownership

Table 2: Categorization of VAS and Example Services (Partially Based on Meier and Andersson, 2003).

2.5.6 3PL innovation and service development

Innovation is a prerequisite for remaining competitive in logistics business environments where customer expectations change. Service innovation results if the firm can think on a behalf of the customer and offer results that exceed the customer's current expectations of what excellent customer value is (Chapman, 2003).

The essential task of 3PL firms is to support the value creation processes for their customers. In many cases, VASs are quite customer-specific and offered by 3PL in response to customer requests, or in response to recognized needs, even if those needs are not articulated by the customer (Atkacuna & Furlan, 2009). The new VASs are thus often closely related to further service customization and customer-specific functions.

Innovation approaches utilized by LSPs is systematically represented by Wallenburg (2009) and illustrated in Figure 7. Internal innovation is often induced by the need for better efficiency and cost reduction. Most of the innovation is, however, motivated by customers. Market innovation aims at developing services that, according to the expectations of the provider, will be attractive to many potential customers. When innovation is not directed towards the entire market but a specific customer, it usually constitutes a clear investment towards an existing or a desired long-term relationship. The classification also captures the fact that innovation may be pro-active or reactive (provider- or customer-driven), and it targets cost reduction or performance improvement. Here, performance must be interpreted more broadly, also including the ability to fulfill needs for new logistics functions. According to Wallenburg (2009), an LSP in an outsourcing relationship must innovate in advance and prepare an improved solution to be selected by the customer, to offer better service than the competitors.

However, the innovation level by LSPs in practice is often low. Common reasons for that are that innovation process management is difficult to manage, costly, and may only help in a limited part of the LSP market (Shen et al., 2009). The customer is often cost-focused and may be unwilling to accept the cost of new service development (Wallenburg, 2009).

Innovation often originates by the LSP's field personnel when they react to certain customer problems, or in response to a customer's request. A new logistics service may start out as a single-customer solution in some geographical region (Wagner & Franklin, 2008). New services development is cost- and time-intensive, especially in the implementation stage (de Jong and Vermeulen, 2003). Too often, preparation of a logistic solution occurs under time pressure and is not implemented generally enough to become part of the standard service portfolio. Therefore, the developed service is often offered only to the original customer (Wagner & Franklin, 2008).

2.6 3PL relationships

Relationships between the provider and the customer organizations can take various forms. Bolumole (2003) discusses three types of relationships. Transactional, arms-length relationships are limited to one-time contracts where the buyer typically tries to minimize commitment and leave options open for finding a "better deal" for the next contract. Bilateral strategic partnerships require longer-term commitment and goals alignment from the two participants. This makes it possible to invest more in the relationship, systems integration, and organizational alignment, which enables higher efficiency and better competitive advantages for both parties. Finally, the last stage of relationship development is the supply chain alliance stage. When all actors will work towards common strategic goals in a coordinated and integrated manner, it will maximize efficiency and competitive edge for the supply chain as a whole (Bolumole, 2003).

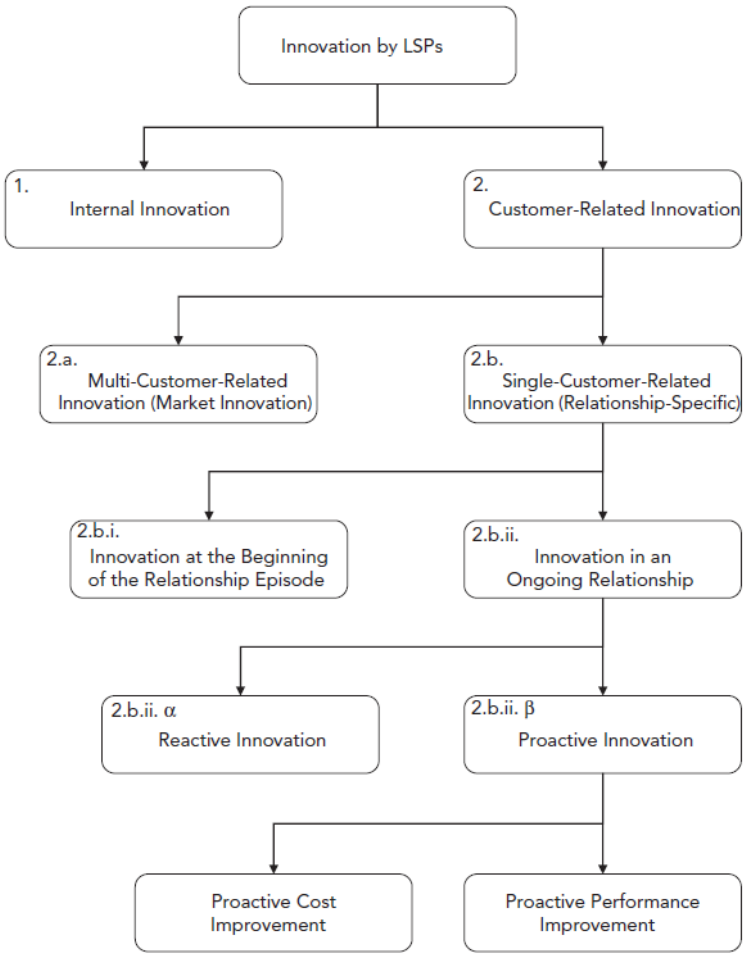

Figure 7: LSP Innovation Modes (Wallenburg, 2009, p. 77)

Figure 8: 3PL Relationship Types. (Capgemini, 2016, p.18). Reprinted with permission.

Another classification of relationships (Capgemini, 2016) is depicted in Figure 8. In tactical relationships, the consumer seeks cost minimization and views logistics services as a commodity. In the other extreme, strategic relationships, the provider and the customer become long-term partners with aligned strategic plans (Stefansson, 2006) and focus on

optimizing operations. The middle level is a service partner relationship where the customer may seek competence assistance to determine a good logistics solution. For the logistics scenario discussion in Sec. 2.7, we have chosen this classification (Capgemini, 2016) due to its familiar terminology and ease of interpretation in communication with survey and interview participants. Figure 9 (Capgemini, 2016) indicates that almost two thirds of 3PL relationships today go beyond the tactical level.

Figure 9: Distribution of Relationship Types in 3PL Outsourcing (Capgemini, 2016, p. 18). Reprinted with permission.

2.7 Logistics scenarios

The logistics market is characterized – and complicated – by the fact that there exists a large variety of categories of services, 3PL providers, customers, and customer-provider relationships. Each such category creates a dimension for describing the provider-customer situation at hand. We will refer to a certain combination of these categories as a logistics scenario.

The preceding sections have outlined possible classifications in each of those dimensions. In Table 3 we recap and summarize them, since these classifications provide a starting point for understanding how to determine which VAS types should be considered in different situations. To those scenario dimensions, we can fit different service types in Sec. 2.5.5, e.g. five primary performance areas of value-added services (Bowersox and Closs, 1996) or the categories in Table 2.

Figure 10 illustrates these dimensions, where the resulting scenario is expected to have a corresponding set of suitable VAS types. The criteria in violet constitute one possible choice of criteria for the three dimensions, but many others are possible.

Dimension	Examples
Providers	Core competencies (Berglund, 2000). Problem solving vs. customer adaptation ability (Hertz & Alfredsson, 2003). Scope of services vs. customization ability (Stefansson, 2006)
Customers	Actor role in supply chain, strategic importance of logistics-related operations (Parashkevova, 2007). In-house logistics competence (Bolumole, 2001). Industry segment (Soinio, 2012)
Relationships	Tactical/partnership/strategic relationships (Capgemini, 2015) Transactional/bilateral/SC partnership (Bolumole, 2003)

Table 3: Logistics Scenario Dimensions.

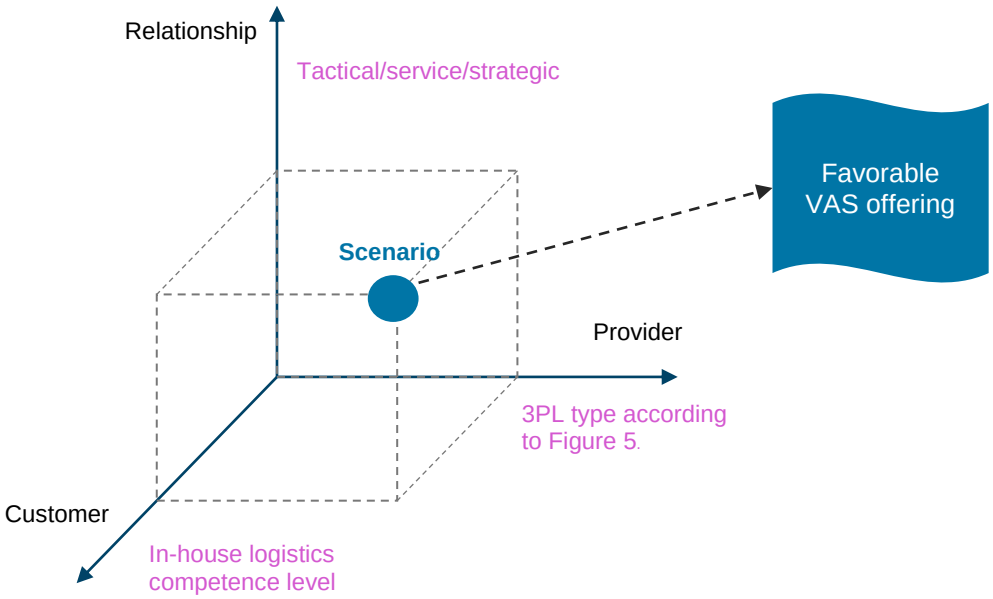

Figure 10: Logistics Scenario Dimensions and Mapping to a VAS Offering (by authors).

2.8 Summary of the frame of reference

We conclude this chapter by tying together the different parts of the theory we have covered. The research questions regarding 3PL VAS offering decisions are directly affected by two perspectives. We started with the customer perspective and discussed motivation for outsourcing in general and outsourcing advanced services in the logistics area in particular. We have seen that deeper specialization in own core activities and the possibility to develop strategic customer-provider collaboration also motivates and enables outsourcing of advanced functions that lie quite far beyond common transport and warehousing services. We have also presented criteria that customers use for selecting providers where the ability to adapt to the customer's requirements and provide high service quality are key metrics.

From the provider perspective, we have presented the general service concept and its application to logistics and 3PL. We provided a thorough discussion of different types of 3PL services and their prerequisites, from basic to advanced value-added services. The different 3PL provider types according to several classification principles were also presented. In order to provide advanced services, the provider must have sufficient service development and innovation capabilities.

We also elaborated on different 3PL relationship types, from tactical to strategic relations. The reviewed literature indicates that the range of services that are feasible to provide heavily depend on the relationship type. Or conversely, in order to offer more advanced services, a strategic relationship building is motivated.

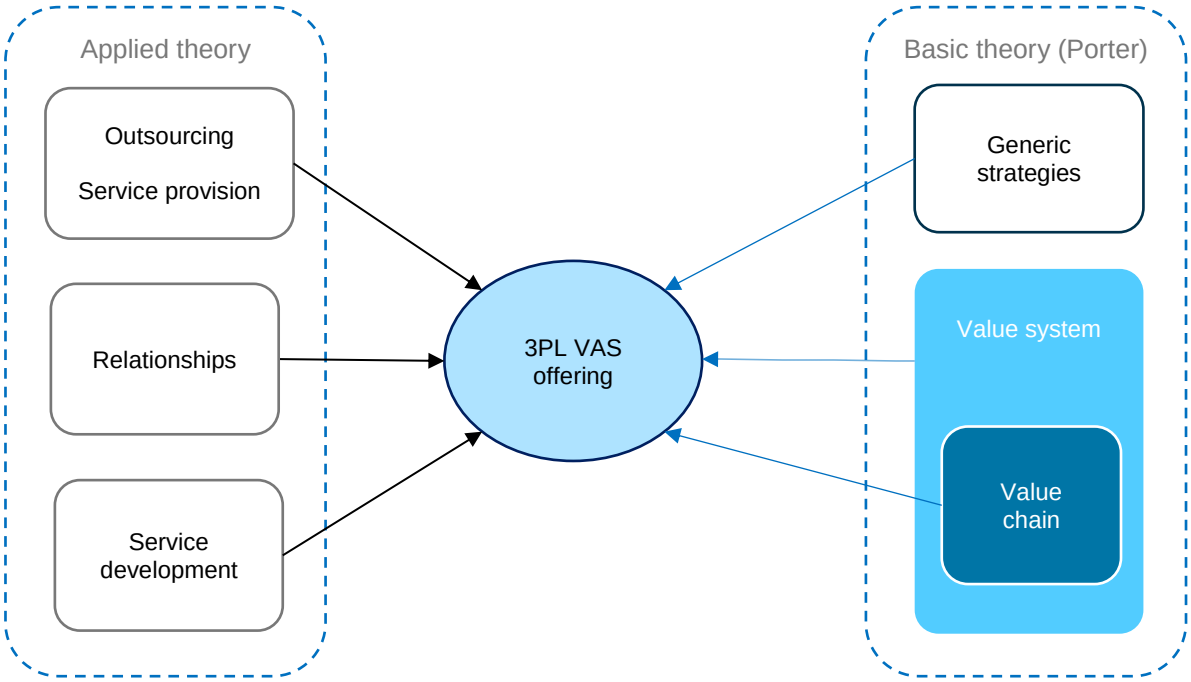

Figure 11: Summary of The Theoretical Frame of Reference for Studying VAS Offering (by authors).

All covered theories contribute knowledge and set the scene for analyzing VAS offering choices. Figure 11 depicts how the applied theories together with the basic theories of Porter combine to create a suitable theoretical basis for studying the VAS offering process. The 3PL provider we will investigate is shown in the center, with outsourcing and service provision, relationship, and service development and innovation theories forming a practical frame of reference for VAS offering discussion. The value chain, value system (Porter, 1985), and strategy selection principles (Porter 1980) provide guiding principles for the outsourcing, service offering, and service development decisions. The theory indicates that VAS decisions should depend on customer needs and expectations (selection criteria), existing provider capabilities and development possibilities, as well as the established relationship or the feasibility of evolving it. All of this should be viewed in the strategic value chain context.

We have also formulated multiple dimensions for defining logistics scenarios to work towards the purpose of the thesis – understanding decisions which VAS offerings make sense in which situations. These will be used to analyze empirical data and develop an improved

understanding of VAS offering principles. Taken together, the elements of this frame of reference are well suited for addressing the research gap – the lack of guiding principles for VAS offering – that we identified in Sec. 1.2 and our research questions.

3 Methodology

This chapter presents and motivates the methodological choices for the study and describes the research process we have used.

3.1 Introduction

Before presenting the actual findings of our study, we begin by laying the groundwork for understanding the choices we made for conducting it. Here, we aim to provide sufficient motivations, based on research methodology principles, why the chosen approach is appropriate for our topic and research questions. This is instrumental for the credibility of the results presented later (Crotty, 1998).

We start by introducing the "research onion" model by Saunders, Lewis and Thornhill (2012) that illustrates the multiple layers of methodology decisions to be made in research design. We then go through all the layers and motivate the choices we have made when planning this thesis. Approaching the innermost core, particular attention will be given to data collection and analysis aspects. We conclude by discussing research quality and research ethics aspects of the study.

3.2 Main methodology choices

The choices of different approaches, strategies and methods can be explained using the "research onion" model developed by Saunders et al. (2012). It illustrates the stages to be covered in the research design process in a systematic sequence where each next stage builds upon decisions made in previous stages. The onion model is depicted in Figure 12. In the following, we step through the layers, describe their functions, and explain the choices made in our study.

3.2.1 Research Philosophy

Research philosophy at the most general level consists of ontology and epistemology elements. Ontology reflects the set of beliefs about the nature of the reality that is being investigated (Easterby-Smith, Thorpe & Jackson, 2015). The field of epistemology deals with assumptions about ways to inquire into that reality to understand it.

The two main epistemological frameworks are positivism and constructionism (Easterby-Smith et al., 2015). Positivism argues that reality exists independently of the object or phenomenon being studied and the observation does not depend on the subject or the observer. Constructionism, on the other hand, argues that the inherent meaning of social phenomena depends on, and even is created by, each observer or participant group. According to this philosophy, what is observed is interpreted differently, depending on the participant. The suitable approach is to examine differences in the experiences and their expressions among the participants. The epistemological beliefs can further be subdivided into strong and moderate flavors of the two extremes.

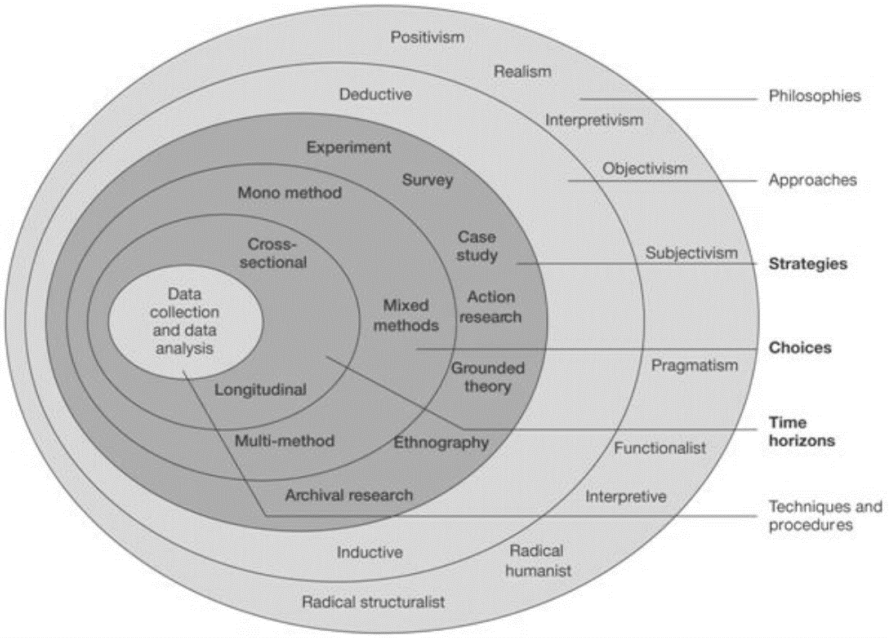

Figure 12: The Research Onion Model. (Based on Saunders et al., 2012, p. 128).

It is uncommon that any given study can be classified entirely under a single epistemological view (Easterby-Smith et al., 2015). The current thesis follows generally the positivist epistemology, although not its strong flavor. Our starting point are certain propositions about the structure of the logistics scenarios and some expected dependencies of VAS usage obtained from the literature. We survey and interview numerous companies in order to collect data that we expect to be generalizable beyond the group of studied companies. The study can test certain assumptions that we are able to formulate from the literature. However, some aspects also point in the constructionist direction. The study is primarily verbal and also aims at creating new insights from the collected data.

To further characterize the research philosophy of the study, we can place it within the research paradigm dimensions presented by Easterby-Smith et al. (2015). Our approach is more realist than constructionist and the researcher engagement mostly detached (no active participation in the organizations and actions studied), placing us approximately at the critical realism paradigm (Figure 13). One interesting feature of this paradigm is that causality is seen as a potential – not automatic – association between events and decisions. This is intuitively correct in that we seek to establish relationships that are likely, but not guaranteed, to hold in practical situations. This is a reasonable starting point since the formulated logistics scenarios are simplifications of the complex relationships in real supply chain relationships and their mapping to real-life cases is approximate at best.

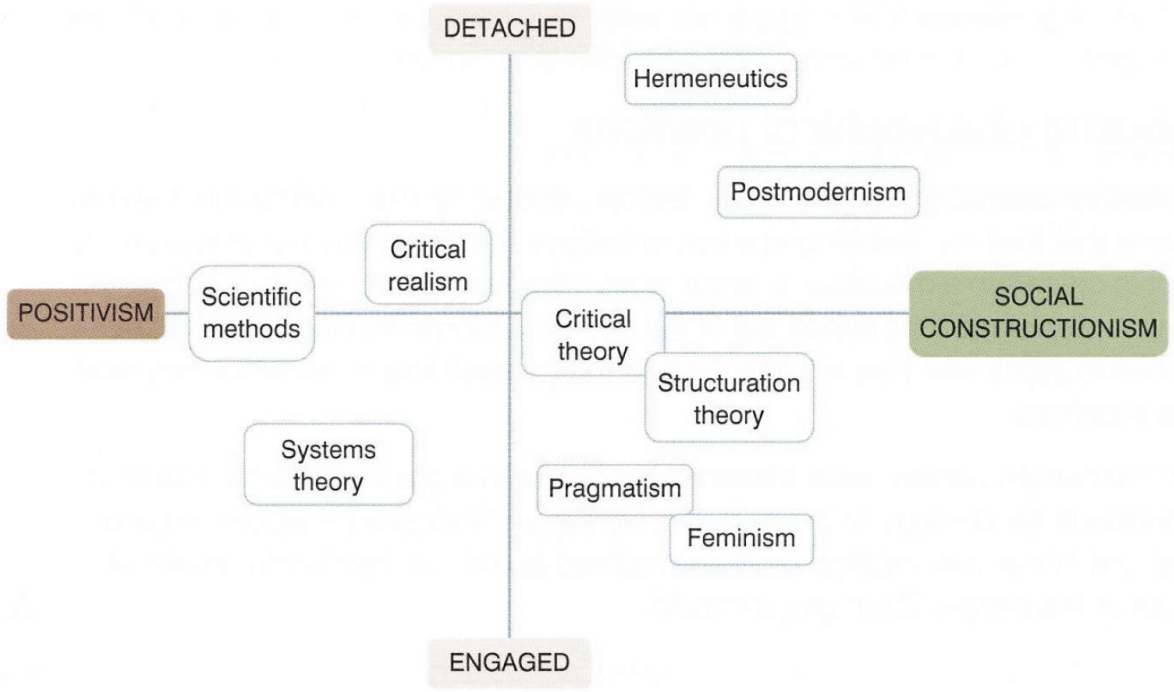

Figure 13: The Research Paradigm Space. Easterby-Smith et al., 2015, p. 63).

3.2.2 Research Approach

The two extreme representatives in this layer are the deductive and inductive research approaches. The deductive approach formulates hypotheses based on a pre-existing theory and then formulates the research approach to test it. It is suited e.g. to situations of examining whether the observations fit previous research. The deductive approach moves from the general to the particular: the theory is first established and the empirical knowledge is then tested against it (Kothari, 2004). The inductive approach, on the other hand, moves from the specific to the general – the researcher looks for patterns in the data from observations, often without a fixed initial framework to limit the data collection (Flick, 2011).

Our literature search has not revealed existing in-depth discussion of VAS offering principles or corresponding frameworks. Thus, the research process is partially inductive, where empirical data together with secondary data from non-academic literature is used to advance the understanding of VAS offering decisions by the 3PL providers. However, we also use the existing theory to guide the structure of the relationships and dependencies we seek. The theory can be used to evaluate to which extent the empirical findings match the prior academic knowledge; the study thus also contains a deductive element. We therefore assess the research approach on a whole as abductive, where data is collected to explore a phenomenon and its possible patterns, which are later tested to generate new knowledge or modify existing theory (Saunders et al., 2012).

3.2.3 Strategy, method choices, and time horizon

We now arrive at the layers more immediately affecting the practical design of the study.

Research strategy can be viewed as the link between the philosophy and data collection methods. It describes how the researcher intends to carry out the work (Saunders et al., 2012). The strategy can consist of one or several approaches, such as experimental research, action research, case study research, interviews, surveys, or a systematic literature review.

Each of these approaches has their advantages and disadvantages that can affect the validity of the results (Bryman, 2006). To improve the quality of the results, multiple methods of data collection and gathering data from more than one source within a studied organization may be used. This is referred to as triangulation and is commonly used to increase the trustworthiness of the results (Saunders et al., 2012).

In this study, we have chosen to use survey and interview approaches for primary data collection, augmented by using secondary data in the form of statistics from existing literature. This enables triangulation to avoid biases inherent in relying on a single type of data collection (Bryman, 2006).

The onion model (Saunders et al., 2012) next reveals the layer of method choices. The choices presented are essentially between the quantitative and qualitative approaches. The study may be designed using a mono-method approach relying on a single method, or mixed and multi-methods that use several methods on a single or separate data sets, respectively (Flick, 2011).

One of the prerequisites for a reliable quantitative study is a fairly large sample size – at least 50-100 samples to obtain confident regression model or correlation results (Saunders et al., 2012). Since we considered it infeasible in this study to gather information from such a large number of companies, we have chosen the qualitative approach. This way, data from a smaller sample size and the derived results are still valid in the more constructionist perspective (Easterby-Smith et al., 2015). The qualitative approach is also generally deemed appropriate for answering research questions of the type "what" and "how", as is the case in this thesis (Saunders et al., 2012). Since different information gathering methods – surveys and interviews – are used, the study can be classified as multi-qualitative.

Approaching the core of the onion, the time horizon of the study presents a choice between cross-sectional and longitudinal approaches. A cross-sectional study collects data at a given point in time and can be thought of as a snapshot image of the observations (Flick, 2011). This is the time scale selected for the thesis – we are interested in VAS offering principles as currently exhibited by the companies we survey and interview. A longitudinal time horizon for data collection, on the other hand, would imply repeated observations over a longer time period. This is mostly relevant when studying changes over time (Flick, 2011), something that is outside the scope of this study.

3.3 Data collection

The innermost core of the research onion deals with data collection and analysis. These stages make up most of the practical work in a study. Suitable data collection procedures are critical for providing material for subsequent analysis, building understanding and frameworks, and drawing conclusions. They are also important for ensuring validity of the study. We will therefore thoroughly discuss our data collection approach in this section.

We utilize both primary and secondary data in this thesis. Secondary data originates from logistics industry reports. Our sources of primary empirical information are 3PL providers

and customers (manufacturers and/or retailers) in Nordic countries. Two main types of primary data collection approaches are used.

3.3.1 Surveys

We use survey questionnaires for primary data collection from a broad sample of companies. A questionnaire commonly refers to a data collection technique in which multiple respondents answer the same set of questions (deVaus, 2002). Survey data collected by this technique has a narrower range than e.g. interview-based data since the number of structured questions that can be asked in the questionnaire is limited. However, it is an efficient tool for finding patterns and associations in the observed phenomena (deVaus, 2002). We have contacted a large number of companies, both 3PL customers and providers, to inquire about their experiences with 3PL VASs. From the former, we obtained information from the customer perspective (Sec. 2.2), in particular which services they seek and their outsourcing and service selection behavior. The latter offered information from the provider perspective (Sec. 2.5), with focus on how the service offering and customization options are determined and which factors play a role in these decisions. Some of the companies are located in the Jönköping area, but most are from other parts of Sweden and other Nordic countries.

We formed our questionnaires according to the guidelines by deVaus (2002). The questionnaire should be relatively short and simple. The questions should follow a logical order, starting from easy and moving to more difficult ones. Closed questions are preferred, open-ended and vague questions should be avoided. Leading questions are also inappropriate. Our questionnaires are presented in the Appendix 2 and 3. The questions were mostly multiple-choice, used partially to categorize the responding company according to several scenario dimensions, partially to assess the types of VAS they are involved in.

To develop theoretical understanding and formulate a framework that covers a broad range of logistics scenarios, many different types of 3PL provider and customer companies should be contacted. To obtain generalizable results, various representatives of each of the categories should be included (Saunders et al., 2012). The time constraints of the study, however, limit the number of companies we have been able to include. Therefore, elements of the theoretical frame of reference are used to complement the primary survey data.

An important element of survey design is the sample selection. Kothari (2004, p.152), defines sampling as a process of *"obtaining information about an entire population by examining only a part of it."* We used non-probabilistic sampling where the chance of being selected from the total population is unknown. The sample size was limited and we had no opportunity to ensure that all provider and customer classes are proportionally represented.

While such sampling would not be suited for answering research questions that require statistical conclusions about the population, it is suitable for qualitative studies aimed at identifying possible patterns in observed phenomena (Saunders et al., 2012). The survey results are therefore meant for illustration and qualitative validation of the empirical material from interviews. No statistical conclusions should be drawn, but the questionnaires provide existence examples for different service types in different scenarios and order-of-magnitude indications of factors affecting VAS offering decisions.

The surveys were self-administered by the respondents. They were distributed via the Qualtrics platform, https://jibs.eu.qualtrics.com, sent to representatives of the companies via personal links in emails and via Qualtrics' proprietary distribution platform. The survey distribution and response overview information is provided in Table 4.

Survey	Survey population	Response rate	Platform	Dates
VAS offering – provider view	115	33%	Qualtrics/JIBS	2017-03-12 .. 2017-04-07
Logistics services – user view	171	28%	Qualtrics/JIBS	2017-04-17 .. 2017-05-03

Table 4: Summary of Data Collection Via Surveys.

3.3.2 Semi-structured interviews

Interviews were used for further primary data collection from some companies contacted for the provider questionnaire survey. To better understand motivations for service offering decisions, we have performed in-depth interviews with a limited number of 3PL provider companies. The interviews were conducted last, after an initial orientation based on theoretical literature and the provider survey. Overview information about the interviews we conducted is presented in Table 5.

A semi-structured interview starts with the researcher having formulated a list of themes and open-ended questions to be covered. However, the interviewer lets the interview person develop any relevant discourse within these themes and does not strictly control the subject matter that is covered (Saunders et al., 2012). This way, semi-structured interviews can provide answers not only to questions "what" and "how", but also to "why".

Our interview questions were prepared using on the previously acquired information from literature and the provider surveys. The interviews allowed obtaining better insights into which factors in practice steer the VAS offering decisions. An example interview guide is included in the Appendix 1. All interviews were recorded and transcribed shortly after the interview occasion. Further processing and information extraction was based on the transcripts.

Some of the information shared by the companies included details that lie quite close to their operations and strategical reasoning. A few of the interviewed companies requested anonymity while others did not, but we have chosen to make all of them anonymous in order to protect any potentially sensitive information and avoid any business impact.

	Company type	Interviewee position	Location	Type	Duration	Date
[A]	Small 3PL provider	Business area manager	Ljungby	In-person	90 min	2017-04-10
[B]	Medium 3PL provider	Logistics business developer	Stockholm	In-person	120 min	2017-04-11
[C]	Large 3PL provider	Operations manager	Jönköping	In-person	90 min	2017-04-07
[D]	3PL platform developer	Sales and marketing manager	Malmö	In-person	90 min	2017-04-04
[E]	Large 3PL provider	Warehouse manager	Jönköping	In-person	90 min	2017-05-03
[F]	Large 3PL provider	Site manager	Jönköping	In-person	45 min	2017-05-11
[G]	Large 3PL provider	Business development director	Helsingborg	Phone	45 min	2017-04-26
		Regional manager	Jönköping	In-person	45 min	2017-05-15

Table 5: Summary of Data Collection Via Interviews.

3.4 Data Analysis

After data collection, the acquired information must be converted into a manageable form for identifying patterns and drawing conclusions from the study. Reduction and structuring of the collected data is critical for being able to utilize it efficiently for analysis and conclusions (Saunders et al., 2012).

Qualitative data analysis can utilize three general approaches: summarizing, categorization and structuring (Saunders et al., 2012). During summarizing, the relevant information is extracted from the collected data. We did this by formulating key pieces of information from interview transcripts in brief statements. Structuring is used to systematize the data by creating specific structures and attaching corresponding data to them. We used this approach mainly for survey results, extracting relations that are usable for developing the framework.

The research design elements chosen for this thesis study, from the overall philosophy to data collection and analysis techniques, are summarized in Figure 14, using the previously discussed research onion model. This helps visualize the relationships between the design choices.

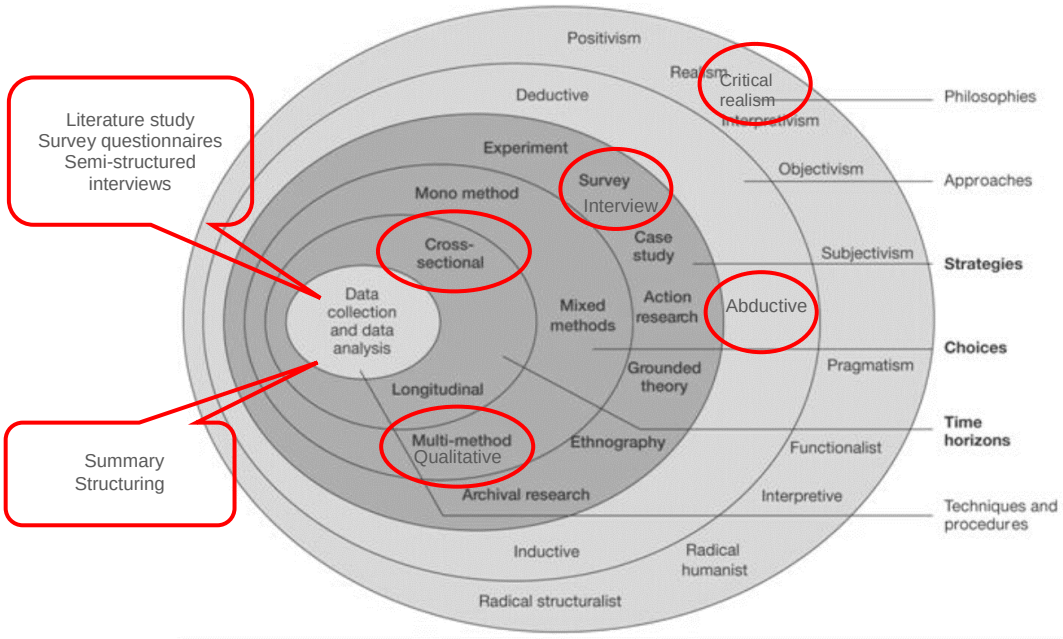

Figure 14: Thesis Study Design in The Research Onion (Based on Saunders et al., 2012, p. 128).

3.5 Research Quality

The quality of data collection, analysis, and results interpretation is of utmost importance to add value to the existing body of academic knowledge (Saunders et al., 2012). Below, we discuss the main quality criteria for qualitative research and present measures taken in our study to ensure that those are followed.

3.5.1 Reliability and validity

The most important criteria for business and management research quality are reliability and validity (Crowther & Lancaster, 2009). Reliability describes whether the chosen data collection method would lead to the same results in another study. Saunders et al. (2012) defines reliability as the extent to which data collection techniques and analysis procedures will yield consistent findings. Reliability can be evaluated by evaluating (Saunders et al., 2012) whether the measures give the same results on other occasions, whether similar observations can be reached by other observers, and whether there is transparency in how sense was made from the raw data.

There are four main potential threats that can compromise reliability (Saunders et al., 2012). The first one is *subject or participant error* – the responses from a given respondent may be different at different times. The risk of participant error can be minimized by selecting as non-distracted time for the interview or the survey as possible. The second threat to reliability is *subject or participant bias*. One way to reduce such bias is e.g. to guarantee anonymity to the respondents, as well as the companies, so that they do not need to be concerned e.g. whether their answers match the official company policies. Another threat is *observer error* – the formulation of interview or survey questions may depend on the particular researcher. The final threat is *observer bias* – a risk of subjectively interpreting and

distorting the replies. To minimize the effects of subjectivity and the impact of the last two risks, we performed interviews and processed survey replies together as a team.

The other major quality criterion is validity – do the findings really match the reality they are supposed to reflect? (Saunders et al., 2012). A prerequisite for validity is that the chosen data collection method must actually capture the information the researcher intends measure. It is the task of the researchers to evaluate whether the chosen data collection methods will provide data that is valid (Crowther & Lancaster, 2009). We have carefully assessed our methods and found them to provide relevant information by combining broad and in-depth data gathering approaches, and complemented with secondary data sources.

More specific quality metrics that also need to be satisfied for validity are presented by Guba and Lincoln (1989). *Credibility* means ascertaining that the results of the study are credible from the perspective of study participants. We have been in follow-up contact with several interview persons to discuss some conclusions drawn from the study material. *Transferability* refers to extent to which the results of one study can be generalized to a related but not equivalent context. Since the range of the studied providers was broad, the results are expected to be generalizable beyond the companies we studied. *Dependability* emphasizes the need to account for changes in the research environment. We consider this a secondary factor in this study, due to the cross-sectional approach and limited duration of data collection. Finally, *confirmability* describes the degree to which the result of the study could be corroborated by another independent researcher. While qualitative studies, especially those involving non-probabilistic sampling and interviews, are inherently unique, the collected data and analysis processes have been thoroughly documented which allows relating data from future studies to the current study and meaningfully comparing the respective results.

3.5.2 Research ethics

Both data collection and analysis steps must be performed in accordance with research ethics principles. Considerations of respect, privacy, voluntary participation and confidentiality towards the participants are some guidelines that characterize an ethically acceptable research study (Saunders et al., 2012).

We followed guidelines by Saunders et al. (2012) regarding interaction with the participants. At the start of the interviews and when distributing survey questionnaires, we fully explained the purpose and scope of the study and how the collected data will be used and handled. This provided an opportunity for *informed consent* for the interview and survey persons. We ensured the *privacy* of the research participants by not disclosing the identities of other people and companies contacted in the study, and have kept them *anonymous* in the thesis write-up. This avoids dangers of undesired business impact of the study to the participating companies and of possible managerial criticism to the participating persons within the companies. This also ensures that *no harm* occurs as a result of participation in the study and that the *dignity* of the participants is respected.

Just as much as trust is important for establishing rapport with interview and survey persons, achieving that trust also means that the subjects count on the researchers to handle and use the data securely. This makes the researchers responsible for how the information is stored and interpreted (Easterby-Smith et al., 2015). We treated the gathered information with special care to ensure security. It was stored on our computers in a way that minimized the chance of unauthorized access and ensured *confidentiality*.

Finally, we have also followed ethics principles in reporting the results. *Transparency* has been pursued so that the reader can fully understand the research process and the reasoning, and how the conclusions have been formulated. The results have been formulated so as to *avoid misleading* the reader or causing inadvertent misinterpretations. All the emphasized measures are discussed as criteria for ethical research by Easterby-Smith et al. (2015).

In case a research study has external stakeholders, e.g. customers or financiers, the results of the study may be biased due to actual or perceived influence from the stakeholders (Easterby-Smith et al., 2015). This thesis study was not funded by or performed at the request of any organization or company. Neither has it been a part of formal research projects at JIBS. Therefore, there are no concerns of political or influence on the results or *conflicts of interest*. The issues of apparent *deceptive* behavior that may arise when the researcher is also simultaneously a participant in the studied processes (Easterby-Smith et al., 2015) are not relevant in our study. We have collected the information strictly as observers and have not influenced the VAS offering decision processes themselves. We have not come across any unethical behavior by the studied companies.

3.6 Theory and framework development

Since one of the planned means for creating the understanding of VAS offering principles is to develop a framework that links together the scenario dimensions and the possible VAS categories, we briefly review the principles of theory and framework development.

The purpose of theories is to explain, predict, and understand phenomena. They may also challenge and extend existing knowledge (Sutton & Staw, 1995). A theory typically describes our understanding of workings of a certain phenomenon, in order to have the ability to predict the outcomes of tests that may verify or disprove that theory. Management theories attempt to predict how organizations achieve profits or other business objectives.

A theory may be accompanied by frameworks, where these serve as tools to distinguish and organize the main ideas. Framework may also enable application of the theory in practice (Sutton & Staw, 1995). A framework can support and describe a theory in a research study (Abend, 2008). A theoretical framework is usually not readily available in the literature. It is used to limit the scope of conceptual information by focusing on specific aspects and viewpoints that are relevant to interpret certain data. It also helps understanding concepts and builds new knowledge by validating or challenging existing assumptions (Sutton & Staw, 1995).

Our thesis research follows a mix of analytical and systems schools of logistics research (Gammelgaard, 2004). It is analytical in the sense that we seek to establish objective relations between the scenario definitions and suitable VAS groups and adopt a realist view. However, according to the classification in Table 6, the qualitative study approach and the use of qualitative models also qualifies the thesis to be a part of the system research area.

	Analytical approach	Systems approach	Actors approach
Theory type	Determining cause-effect relations. Explanations, predictions. Universal, time and value free laws	Models. Recommendations, normative aspects. Knowledge about concrete systems	Interpretations, understanding. Contextual knowledge
Preferred method	Quantitative (qualitative research only for validation)	Case studies (qualitative and quantitative)	Qualitative
Unit of analysis	Concepts and their relations	Systems: links, feedback mechanisms and boundaries	People – and their interaction
Data analysis	Description, hypothesis testing	Mapping, modelling	Interpretation
Position of the researcher	Outside	Preferably outside	Inside – as part of the process

Table 6: Logistics Research Approaches (Gammelgaard, 2004, p. 482.)

4 Empirical findings

This chapter presents the empirical data on VAS offering by 3PL providers and VAS usage by customer companies, collected via provider and customer surveys and interviews conducted with 3PL companies.

4.1 Surveys

To experimentally validate and illustrate the VAS selection dependencies, we have conducted surveys among 3PL providers and logistics user companies about logistics services that are relevant for them and their provider-customer relations.

4.1.1 VAS offering – 3PL provider view

To qualitatively validate and illustrate VAS offering principles, we have conducted a survey among 3PL providers who were asked questions about their company's service offering and about specific customer examples regarding their logistics competence, SC role, and services they outsourced from the provider. 38 replies were received. The questionnaire of the survey is presented in Appendix 2.

Below we provide a summary of the survey results. It should be noted that not all respondents filled out all fields, so the total number of replies for different questions differs somewhat. Also, numerous respondents filled out information about several of their customer relationships, so the total number of customer cases exceeds the number of surveyed companies. In some cases, several people from the same company have responded. While this may have distorted the results in other, quantitative studies pursuing statistical precision, it is not a problem for qualitative use of the survey results in our research method.

The surveyed companies are mostly relatively experienced, most of them with least 17+ years of experience. The firms were mostly medium-sized, although some large and small firms were also represented (Figure 15).

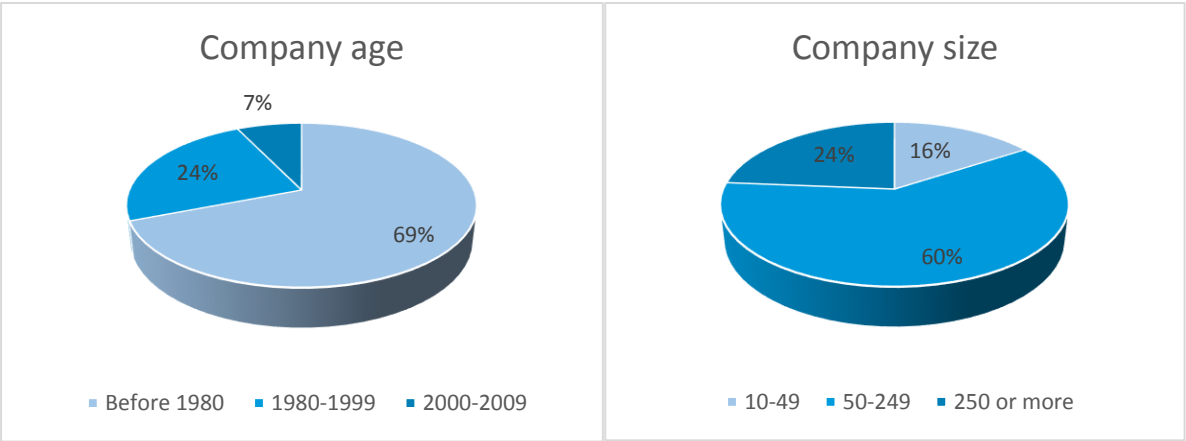

Figure 15: Surveyed 3PL Company Basics.

The providers were asked to assess their service offering and customization abilities. It may be seen that the majority of the providers assess their abilities in both aspects as broad (Figure 16). This suggests that many providers do not deliberately adopt solely the problem solver or customer adapter roles, but pursue both. We asked the providers to self-classify themselves according to the framework of Hertz and Alfredsson (2003); the results are shown in Figure 17. When forced to choose a single category, most selected the customer adapter and service developer types. Note that not a single 3PL provider classified themselves as limited to basic services.

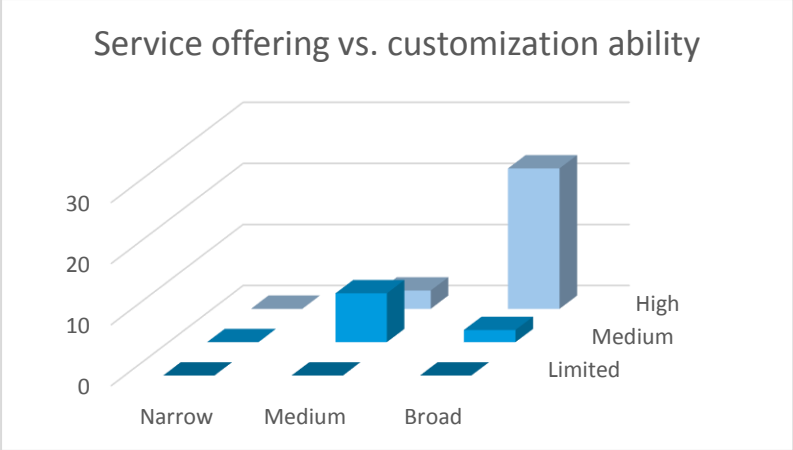

Figure 16: Self-evaluation of Service Offering Breadth and Customization Ability.

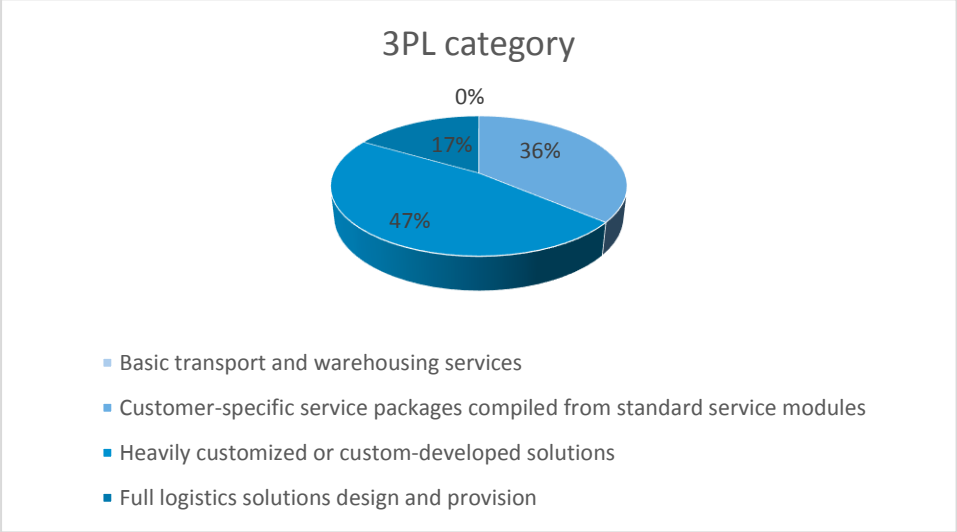

Figure 17: Self-evaluation of 3PL Type by 3PL Providers.

The providers were next asked to indicate which VAS categories they offer. Table 7 indicates the occurrence of different VAS types in the providers' offerings, grouped by the 3PL type self-classification.

Service type	3PL type			
	Basic transport and warehousing services	Customer-specific service packages compiled from standard service modules	Heavily customized or custom-developed solutions	Full logistics solutions design and provision
Transport	0	7	4	5
Warehousing	0	13	8	10
IT	0	13	8	7
Product-related	0	13	9	6
Customer-focused	0	12	7	9
E-commerce	0	11	10	10
Promotional	0	7	9	5
Reverse logistics	0	9	2	5
Administrative	0	8	8	7
Customer service	0	14	9	1
Consulting	0	10	9	6
Financial	0	6	8	2

Table 7: VAS Type Offering Depending on 3PL Role.

The survey also inquired about service innovation drivers – what motivates the development of new services? Explicit customer demand, by one or multiple customers, is indicated as the main driver (Figure 18). Market-driven innovation is secondary.

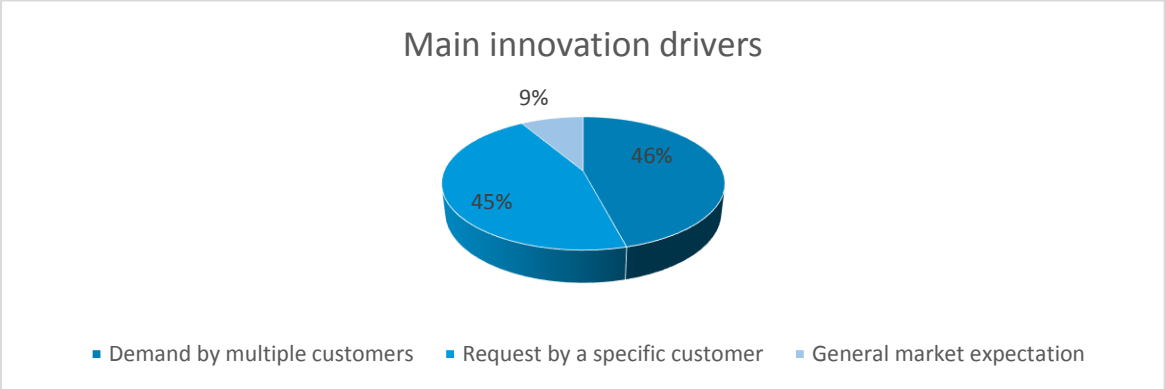

Figure 18: Service Innovation Drivers for 3PLs.

The second part of the survey dealt with specific customer scenarios. The providers were asked to characterize a customer of their choice in terms of its in-house logistics competence, supply chain role, and the provider-customer relationship type. Most customers

were described by respondents as strategic partners; no tactical partnerships were mentioned (Figure 19). While we do not question the tendency that the providers preferably seek strategic relationships, we believe that the complete lack of mention of tactical customers was caused by the fact that the providers spontaneously chose to answer about customers they have longer relationships with.

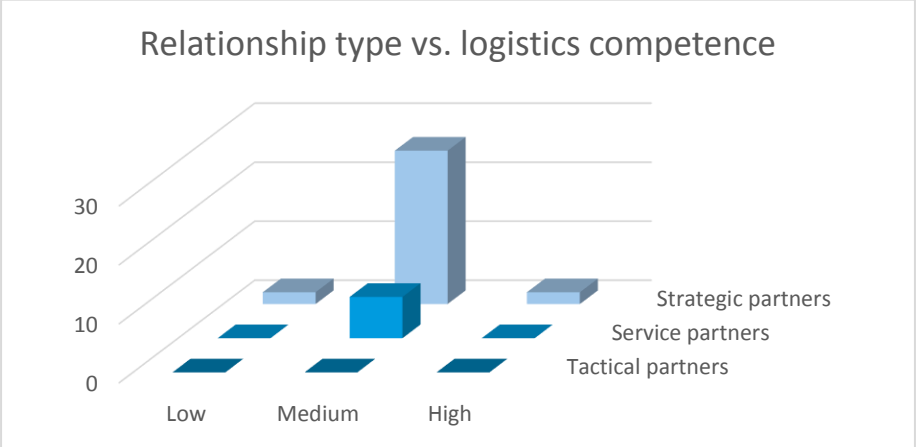

Figure 19: Customer's Logistics Competence and Relation Types, Reported by 3PLs.

In about 2/3 of the cases, the offered services are initiated by the customer, as seen in Figure 20. Out of all service offering instances, only a very small fraction is associated with developing a new service to the customer. In most cases, the offering utilizes an off-the-shelf existing service or a customization of an existing service type.

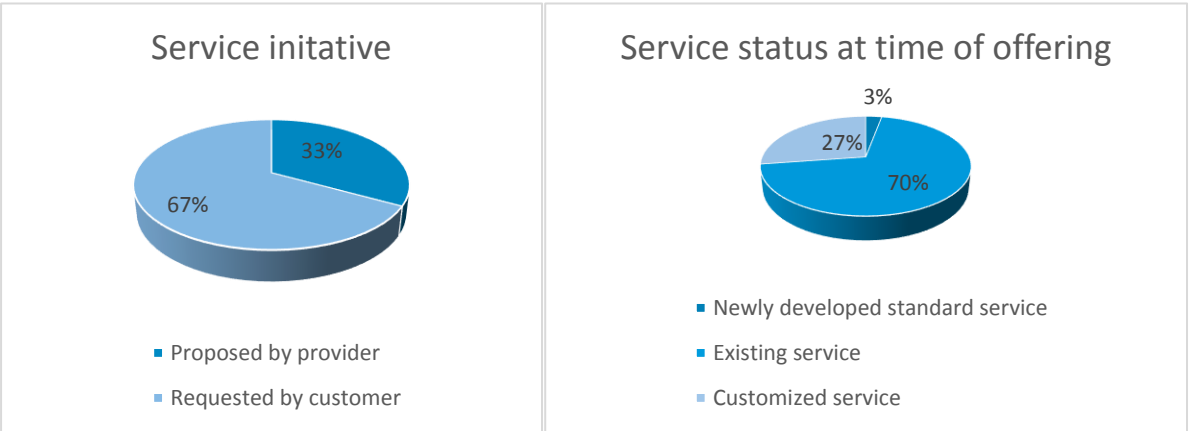

Figure 20: New Service Initiative and Status of The Service, Reported by 3PLs.

Finally, the respondents indicated which services are provided to the described customer. We have cross-tabulated in Table 8 the offered VAS types in three different ways: depending on the relationship, on the customer's logistics competence, and on their SC role.

Service type	Customer relationship			Customer's logistics competence			Customer's SC role		
	Tactical	Service partners	Strategic	Low	Medium	High	Distributor	Retailer	Manufacturer
Transport	0	8	24	2	27	0	8	14	8
Warehousing	0	0	33	4	26	1	11	13	8
IT	0	6	32	2	26	3	10	14	7
Product-related	0	3	29	0	26	6	6	18	9
Customer-focused	0	7	24	0	27	7	4	16	14
E-commerce	0	0	14	0	13	0	0	9	5
Promotional	0	0	8	0	10	0	4	4	0
Reverse logistics	0	0	12	0	14	0	1	6	5
Administrative	0	0	20	0	22	0	8	14	0
Customer service	0	6	16	0	22	0	6	17	1
Consulting	0	4	9	0	12	0	0	10	7
Financial	0	0	2	0	3	0	0	0	5

Table 8: VAS Type Offering Depending on Customer Characteristics.

Some limitations of the survey should be reiterated here. The self-evaluation of logistics capabilities and the 3PL type by the provider may not be fully objective, possibly including the desired, not only present, capabilities of the provider. We also believe that the choice of customers in the second part of the survey may have been biased towards customers with whom the provider has a closer and more profitable relationship. Therefore, e.g. customers with tactical relationships or using only basic services or simpler VAS may be absent from the customer sampling due to inadvertent bias by the responders.

4.1.2 VAS offering – user view

To complement the information obtained from the provider survey, we have also conducted a survey among companies that use logistics services, with different logistics needs and setups. Some of the 48 respondents are 3PL customers, while others have numerous logistics in-house functions. Since we also are interested in VASs that could potentially be outsourced to a 3PL provider, even companies that currently do not outsource their services are interesting as indicators of VAS potential. We therefore refer to the companies as *users of logistics functions* – a term which includes both outsourced and in-house operations. The questionnaire of the survey is presented in Appendix 3.

The summary of the logistics user survey results is provided below. Since not all respondents filled out all fields, the total number of replies for different questions differs slightly.

The companies that participated in the survey represent all SC roles – manufacturers, distributors, retailers, and owners of their entire supply chain, or a large part of it. Over a

half of companies indicated that they have an established in-house logistics department, while about a third have only a small number of dedicated logistics employees (Figure 21).

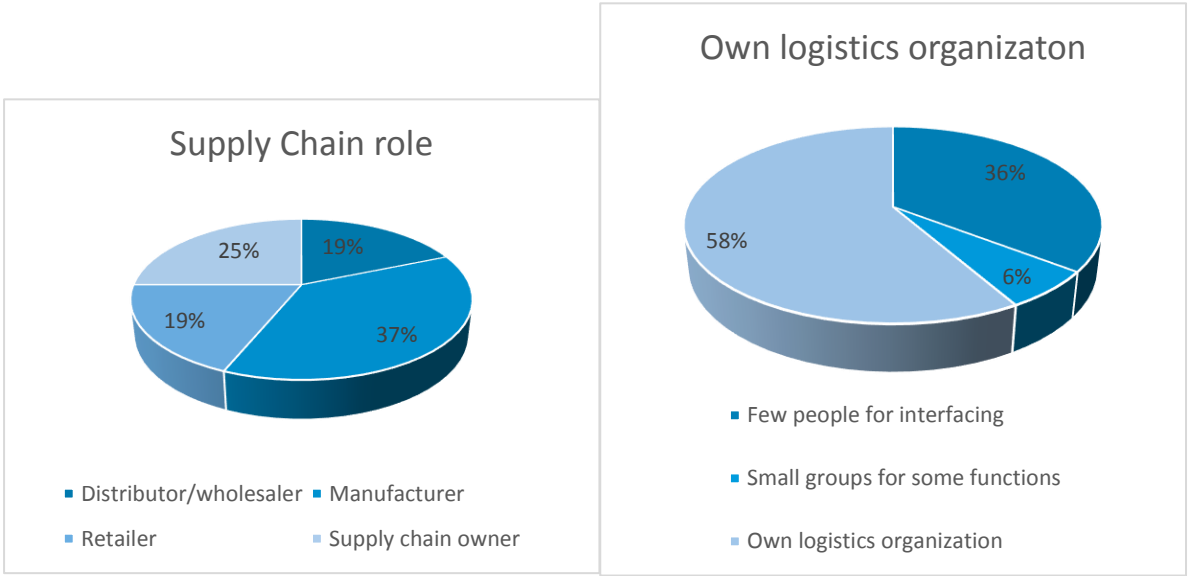

Figure 21: Supply Chain Role and In-house Competence of Logistics Users.

Figure 22 shows how the companies self-asses their logistics competence level. Among companies with an in-house logistics department, most assess their competence level as high or medium, although some surprisingly classify it as low. Companies with lower in-house logistics footprint predominantly classify it as medium, suggesting that they do not experience a problematic lack of competence.

Figure 23 shows which relationship types the customers seek, depending on their in-house competence. Companies with own logistics organizations seek strategic relationships to a high degree, while companies with lower in-house competence are more likely to seek service partner or tactical relationships.

Predominantly, the logistics user companies driving new services to a much larger extent than the providers. Figure 24 shows that only in less than a quarter of the cases, the providers take the initiative for new services. This tendency is particularly obvious in the case of strategic relationships, but also clearly seen in shorter-term relationships.

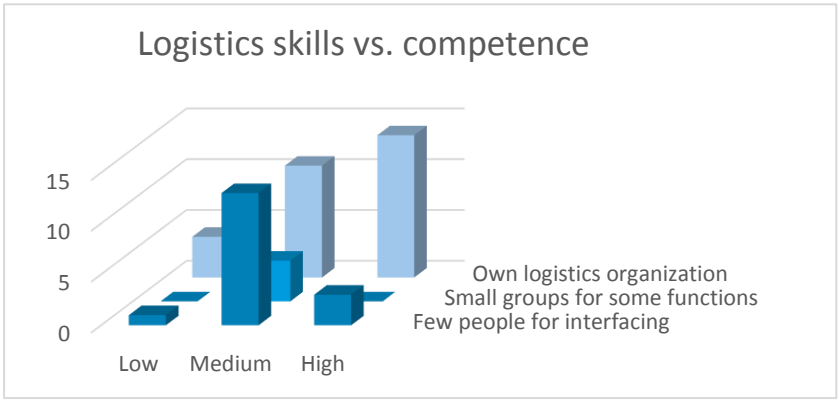

Figure 22: In-house Logistics Skills and Competence Self-assessment.

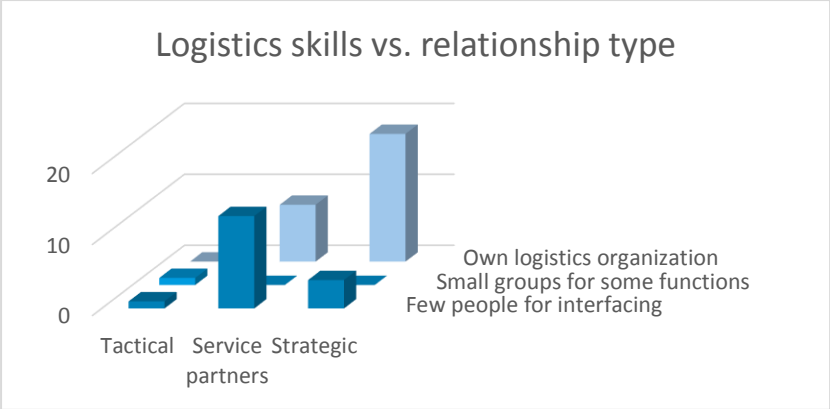

Figure 23: In-house Logistics Skills and 3PL Relationship Type.

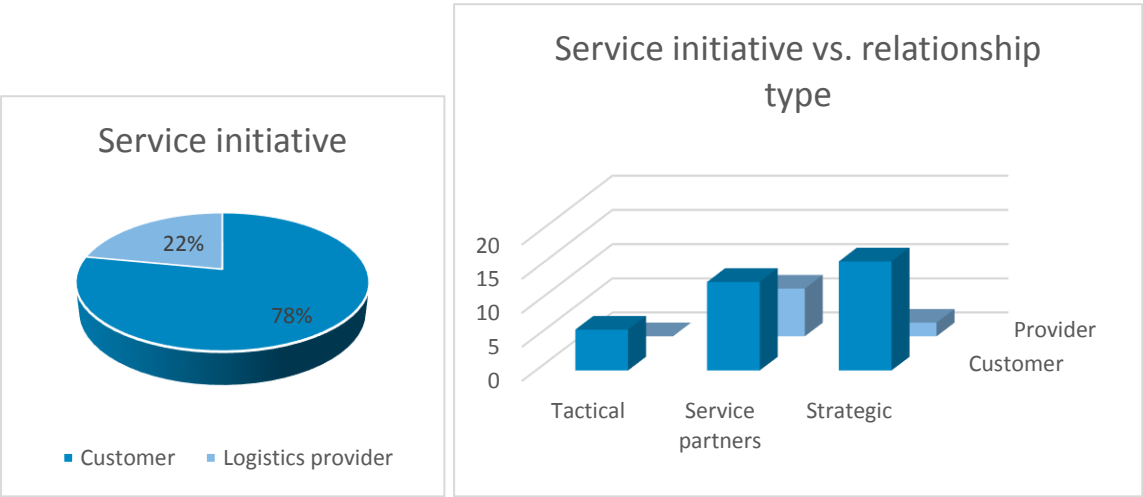

Figure 24: Initiative Takers for New Service Development.

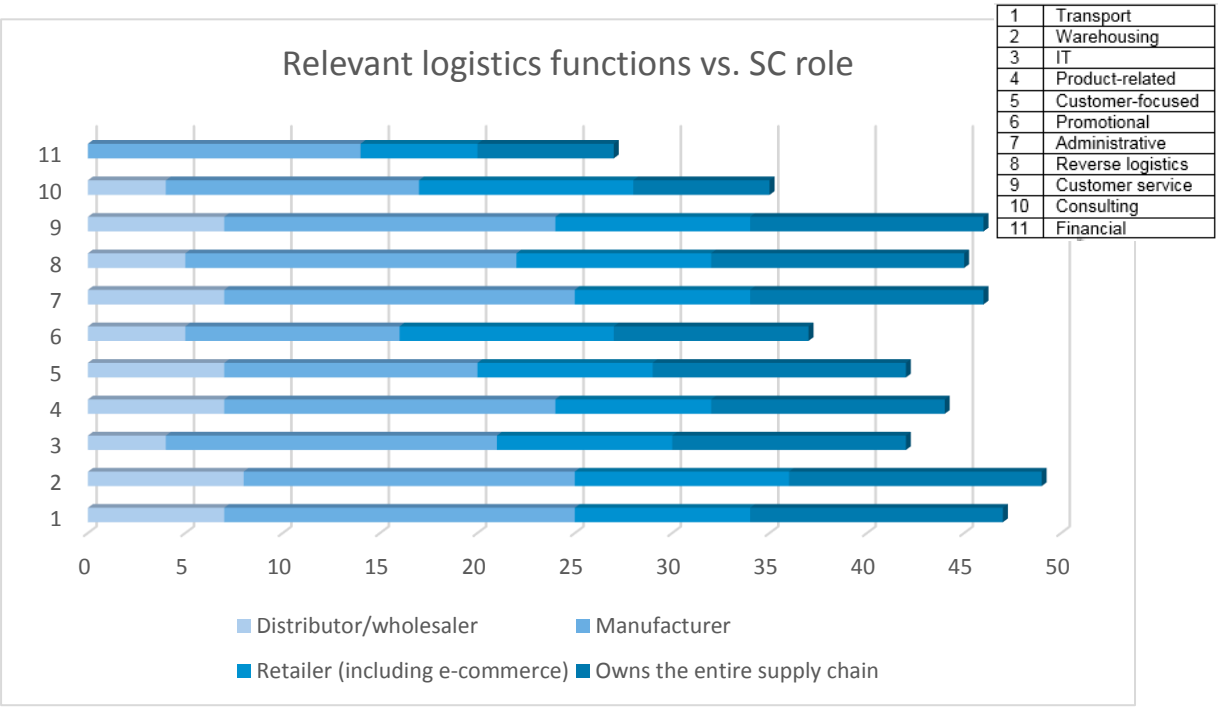

Figure 25: Relevant Logistics Functions for Logistics Users with Different SC Roles.

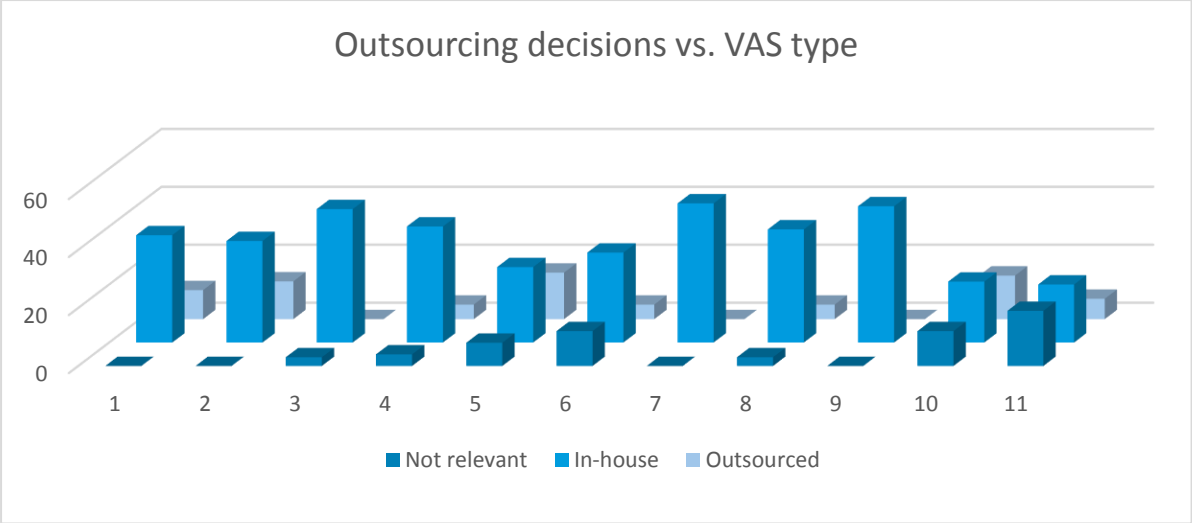

Figure 26: Outsourcing Decisions for Different Service Types.

In the survey, we asked about which logistics functions are relevant for the company and whether these services are performed in-house or outsourced. The functional groups are classified according to the service (VAS) types in Table 2. In Figure 25, including both outsourced and in-house functions, it may be seen that most service types are relevant to most SC roles to a significant degree. Figure 26 shows to which extent the different services are outsourced and Figure 27 illustrates which services are most outsourced in different types of logistics relationships. It is not surprising that the basic transport and warehouse services are often outsourced, as well as customer-oriented services. Consulting is also inherently a service that does not lend itself to in-house execution.

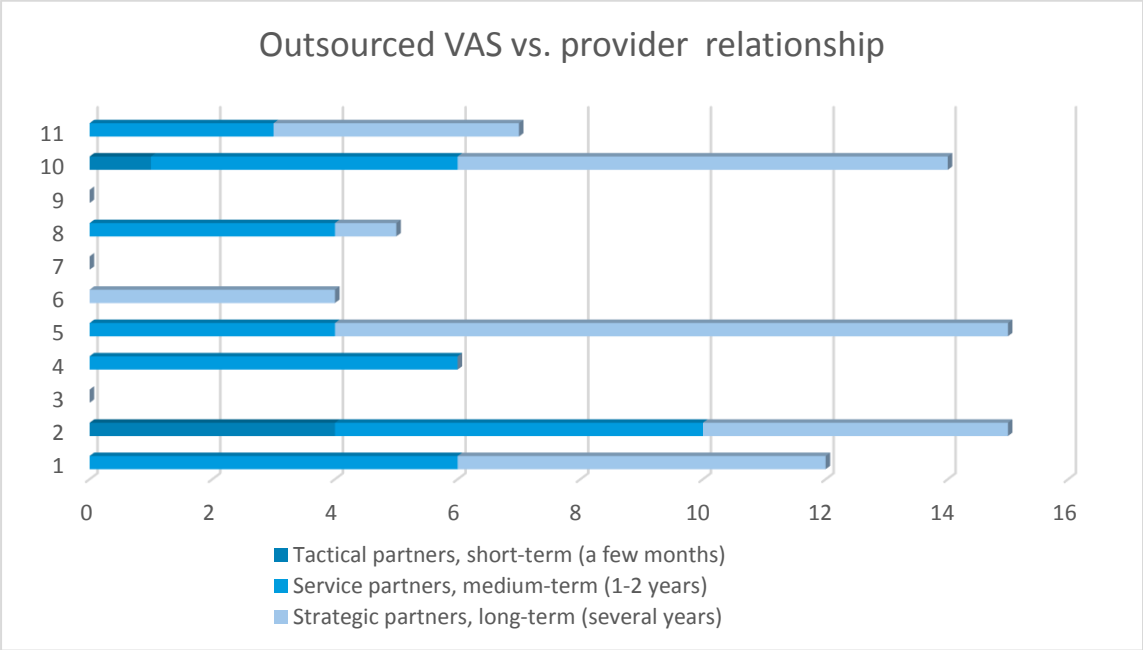

Figure 27: Outsourced Services in Different 3PL Relationships.

We also investigated patterns of outsourcing decisions as a function of the relationship type and the user's logistics organization type. The results were quite uniform and did not indicate any significant dependencies; the corresponding figures have been omitted.

The logistics user survey provides a valuable addition to the provider view. Since the providers' perspective is limited to the service needs that they see through their customer contacts, the user perspective gives a broader view of which functions and services are relevant in which scenarios. However, as indicated by free text comments in the survey, many of the user companies do not fit into the clearly delimited framework of SC roles, provider relationships, in-house and outsourced service execution, etc. For example, numerous companies commented that they have multiple logistics arrangements involving both in-house functions and different logistics providers.

Some patterns were seen in the survey that can be questioned. For example, a large fraction of the responding companies stated themselves to be the owner of entire supply chain or significant parts of it, and surprisingly many users respond that transport services are handled in-house. In general, the distribution of answers in some categories is fairly even and fails to indicate clear trends. The logistics user survey results will thus not be used heavily to argue for specific service selection patterns, but they still serve as qualitative confirmations of some mechanisms discovered and developed based on other data.

4.2 Interviews

We conducted multiple semi-structured interviews with different types of 3PLs, as well as a 3PL service platform developer and consulting company. These companies were chosen to get a diverse view of the relevant challenges and solution approaches to aid our understanding of the VAS offering topics, according to the purpose of the thesis. The interviewed companies constitute a mix of small (less than 50 employees), medium (50-249 employees) and large companies (over 250 employees).

A list of interview questions illustrating the topics discussed in the semi-structured interviews is found in Appendix 1. In the following subsections, we briefly characterize each company and summarize the relevant input obtained from the interview.

We have elected to keep information from each company together to provide a clear sense of what the concerns and priorities were for each of the companies. We have, however organized the interview contents by common themes. In the analysis chapter, material on each theme from all companies is grouped together. The results and analysis chapters therefore form a useful matrix structure for presenting the information.

4.2.1 3PL provider [A]

Company overview

[A] is a small (<50 employees) transport and 3PL company in southern Sweden that owns a truck fleet of <50 cars and multiple logistics warehouses. Transport is their basic service, but they can also involve other providers as forwarders (e.g. DHL, DB Schenker, Bring). They have regular established connections to all major Swedish ports where import shipments are received. We interviewed the business area manager responsible for warehousing and logistics solutions.

The main logistics flow of [A] consists of inbound transport, storage into the warehouse, taking care of empty containers and cars, storage-related services, pick & pack, and outbound transport. Some customers have their global storage at [A]'s location, they pick the order and deliver to the end customer, worldwide. Their VAS range is broad; simple assembly, kitting (compiling sets of multiple articles), e-commerce support, wholesale, etc. They attempt to offer as much service refinements and complex VASs as possible – basic services, pallets in/out, is not a profitable business.

Customer and provider categories

[A] assumes both service developer (pallet in-out and related services) and customer adapter functions (e.g. receiving many packages, scan all goods, EDI exchange, then compile a shipment). The importance of E-commerce is increasing and it allows an efficient business model: [A] receives the order in a handheld terminal, pick it, prepare the package, and aggregate for shipping which may use their own transport or a forwarder. Charging model with respect to most customers is hourly rates, so higher services volumes automatically translate to higher revenue.

For [A], their core competence is their skill of creating solutions with high reliability and at a competitive cost while ensuring quality, but not pursuing the lowest cost. For example, they offer JIT support to a Swedish vehicle manufacturer where they need to hit a 15-minute delivery window – right time, material, right quality. Another competitive advantage is that the warehouse is flexible and reconfigurable. It is easier to adapt to customer's needs for them, compared to large providers.

Their customers represent most industry segments – electronics, hazardous materials, manufactured goods, e-commerce, home furnishings, etc. Many customers have some own logistics competence. They have often have managed their own warehouse, then assessed that [A] can manage the tasks and do it cheaper while they can focus on core activities. Another customer example is a materials trader with no own storage, [A] handles all in/out shipping to form orders. The customer range is broad, which creates diversity and robustness and reduces their dependence on a few important customers.

All SC roles are also represented as customers. They range from manufacturing (small/large products) to wholesale and retail, so [A]'s task can be to provide raw materials for production, or bulk items to stores, or packages home to end customers.

An ideal customer for [A] is one that seeks a long-term, strategic relation who has all their warehousing at [A]'s site and all logistics operations outsourced to [A]. They have 5-6 such customers. Another desirable aspect about the customer mix should be complementary seasonal variations – e.g. a few summer customers and a few winter customers. Such stable customers are desirable, but 3PL contracts can also last only 2-3 months. Still, there is always an element of partnership; purely tactical relations are rare. They see a trend towards shorter contracts since customers' market demands change quickly. E.g. Postnord has short contracts, one year is very long in this context.

The typical customer relationship development process is to initially start with customer's proposed services, then convince them to outsource additional services and functions.

VAS types and importance

The VAS offered by [A] include split point, intermediate storage, shipping aggregation, partial discharge, distribution and pickup, transfer from container to domestic shipping, ID marking, simple assembly, packaging/repackaging, reporting, customs brokerage, express service, cross-docking, and others. These VASs are almost always associated with base services, especially warehousing (transport may be performed by others). Most contracts include at least some VASs.

Decision process

The decision process for VAS offering consists of analyzing customer's operations, identification of potential new services, understanding their flow preferences, and profitability analysis. If [A]'s services match well, they may propose new, different solutions compared to customer's standard routines. Using "new eyes" and reusing other customers' solutions, large efficiency gains may often be found.

If a new service is needed that also requires new resources, [A] can invest to create them, sometimes sharing the investment together with the customer. Sometimes they can borrow or buy relevant resources from the customer. Their aim is to never say no; usually they can find a mutually attractive solution. However, if [A] finds that they have insufficient capacity, they may say no to the order.

All relevant factors can usually be captured in the profitability analysis. Long contracts are preferred since they offer income security and allow amortizing the investment over a longer time, although shorter contracts may pay more per service. [A] also has minimum volumes and contract times. Even if a given VAS on its own may not be profitable, but the customer is happy and [A] can get another contract for another larger service, offering the VAS is part of relationship building. But they make sure not to accept too many losing deals.

IT limitations are often experienced as obstacles, but these issues can usually be solved. Complexity of handling many customized solutions is usually not a problem for [A]. They use subcontractors in many cases, e.g. for packaging and transport services.

Service development and innovation

Service innovation at [A] is guided by market analysis, where the aim is also to find specific customers and business areas. Adding more services to existing customers is still the most typical way to build business. New ideas are often based on expanding on solutions provided to earlier customers. Ideas from logistics industry conventions are sometimes useful, also information from the web, etc. They ty to find solutions in own operations, address the problems they experience, attend seminars about new developments. Sometimes they contact consultants for specific input.

[A] is aware of the importance of learning end customer's needs to optimize interactions with the immediate customer. Those needs are usually learned though the immediate customer's information. Sometimes [A] also has contacts with the end customer to obtain direct information. This is, however, limited to special cases.

The role of VAS is ultimately to achieve empathy and trust with the customer, get a win-win deal – the provider can be profitable helping the customer make money. Some margin in is required in pricing to maintain quality, it is important that the customer understands that. Sometimes customers risk breaking the service by bargaining too hard.

4.2.2 3PL provider [B]

Company overview

[B] is a medium-sized (<250 employees) Swedish transport company and 3PL provider with four warehouse sites in different strategic locations in the country. Their primary focus area is transports in the Nordic countries. But logistics is a big part of the business, supported by warehouses in Sweden and a small overseas department to provide full-service packages (including rail/sea/air) to customers who require a global reach. We interviewed the business development manager in the area of logistics, with over 15 years of transport and logistics experience in the company.

Customer and provider categories

In the Hertz classification, [B] considers themselves more as a customer developer than a service developer due to the extensive customization they offer, although the standard service range is large as well.

The main customer segments that [B] handles are electronics, automotive, chemical, and trade & consumer. Service development depends on customer needs, but even more on the end customer's need which drives the entire supply chain. The interview person recollected that 10 years ago, delivery to the customer was the end point, but today the end customer drives the service needs and delivery solutions – lead times from the factory to the customer are becoming ever shorter. There is a constant need to cut the lead times and maintain a lean production and cost focus.

The customers have a wide range of own logistics competence. Large customers have in-house logistics departments, smaller may have only own purchasing department to control costs. But all but very small customers have at least some logistics operations personnel. Most have producer or wholesaler roles in the supply chain since most shipments are B2B, although some are also B2C.

Relationships and service evolution

Most customers have a strategic relationship with [B]. But regardless of the relationship type, there are always operational meetings and contacts from 4-12 times a year depending on volumes. Strategic meetings are held twice a year, where future prospects up to 5 years ahead are discussed: which VASs the customer needs, who can take the cost of e.g. IT integration (for example the customer, or share 50/50), etc.

Regarding customer relationship development, the interviewee brought an example of a customer who has increased their logistics outsourcing spending by a factor of three during the last 10 years due to close cooperation. Based on the existing relation and service level, [B] analyzes which additional services could be offered. The relationship is the important factor – the provider can perform services that the relationship allows. The decision who should perform a certain operation – can [B] do it more efficiently than the customer? – is based on already knowing the customer well.

In the beginning, it is hard to understand the customer's needs exactly, but often [B] knows more about the actual needs of the customer than the customer itself does. Typically, the relationship starts with standard services of inbound transport, storage, and pick/pack with

outbound transport. Then, in the process, more insights are developed. [B] has more automatic goods handling systems and can see the potential compared to the customer's legacy solutions.

Improvement suggestions often come from the personnel (e.g. better label design, ways to simplify sorting, etc.); lots of feedback and improvements are based on that. If [B] sees a problem or a potential for improvement, they propose it and state the estimated cost. Some customer's employees may work at [B]'s site, which improves communication and makes the relationship closer.

Often the customer does not see their own goods movement. They see the flows in their IT system, but not the physical conditions and handling. Therefore, often they don't know how to optimize the logistics process. One needs to be there to realize these things. For example, a warehouse worker can make sure the supplier sends materials in a way that minimizes the number of pallets to be stored, or change their product packaging to make it more robust in transport.

VAS types and importance

For [B], what is considered VAS depends largely on the customer. Some customers need administration and invoicing help using their data, which is synched with outbound transports from the warehouse. Another example is offering an assembly service at the warehouse so that transports from China can be done more efficiently in flat packages. There are always VASs that are relevant and can be found for any segments – there is always something customer-specific to do to make the logistics flow more efficient. Pallets in/out service has very low margins, so it is much more profitable to offer VAS. Potential VAS identification can be associated with the general mapped process flow. The VASs can be connected to the standard flow like branches to the tree trunk. But the trunk cannot be removed, or the branches have nowhere to fasten. Remote goods transfer monitoring can be one service example of [B] that is not connected to own physical transport/warehousing services, but this is an exception.

In the interview, we discussed the list of VAS types in Table 2. The company provides all types of VAS in our list and most of them are also relevant to multiple 3PL roles (see discussion of roles in Sec. 5.1). IT services are based on what [B] can provide; there are rarely extensive customer-specific developments. Production support is heavily customized, as it needs to be updated for each scenario. E-commerce services are provided at a basic level, with focus on price, since transport fees need to remain low compared to the price of items, while maintaining fast delivery times. [B] has a capacity for promotional services, but these are not requested frequently. They are experienced in after-sales and reverse logistics services and have learned the critical aspects of e.g. proper labeling and bookkeeping of parts. Many administrative services are provided. Customer service requests are infrequent, but full customer service offerings with dedicated phones are large projects. Consulting can range from standard ("which documents do we need?") to advanced tasks ("how to design this"); the prerequisite for good service is understanding the underlying problem. Financial services may take the form of e.g. owning customer's goods while in storage, or supplementary insurance for valuable goods.

Most service types are relevant to all segments. However, some focus on specific segments is needed since a medium-size provider cannot compete in all segments simultaneously. It is

desirable to have many customers in same segments to reuse already developed solutions. New segments are often selected to be relatively similar in terms of service needs, but some new segments are introduced simply since the big providers are not active there. [B] tries to mostly get contracts with advanced VAS, while simple goods flows go to the big operators.

What is considered VAS has changed a lot over time – more services are standard today than 10-20 years ago. Then, it was pallet in/out for the direct customer, driven by the manufacturer (push), now the customer is driving the SC in another direction (pull). The critical question for [A] is: What can we offer to the end customer? It is important to work backwards from the needs of the end customer.

Generally, [B] works close to the customer, tries to develop a partnership from the start, and is driven to satisfy the customer and develop all services they need, but sometimes they need to stop to think what is feasible for them. For example, sometimes customers request reporting functions from the IT system, but this ends up being very costly to [B], while the value to the customer is not so great that the customer would be willing to pay for it.

Decision process

[B] views the service offering decision as a profitability test. Everything is connected to cost – the customer needs to get a reasonable rate and [B] should earn money. Development costs must be compensated by revenue from volumes. For example, it does not make sense to develop a tracking app for one order per month. If several customers require a similar service, development costs may be divided, or 50/50 between customer/provider. [B] can of course also take all the cost, but rates will be higher. An example budget for analysis can include in/out/storage, how many pallets, how much warehouse space, how much time spent in managing it – everything must be counted. Expected volumes and rates are used to estimate the revenue.

Some types of goods are not accepted by [A]: for example, guns, tobacco, or electronics that can be stolen. (A truck with Iphones needs special guards), dangerous goods and explosives. Too high volumes are also not attractive to [B] since they would need robots in warehouses to be efficient. [B] have forklifts, hand scanners etc. but no big production infrastructure.

One the other hand, sometimes it is attractive for [B] to test new services on a small scale even if it is not profitable. Focus is on strategic planning for future development – do we have to go there in the future? They have formal minimum turnover requirement to make it worthwhile to develop IT and maintain competence. But when trying out, the minimum may be ignored. Sometimes a customer starts with very small volumes, but has a convincing marketing story and enthusiastic personnel, so small volumes may be OK for [B] given the future potential.

Regarding service development, it is always easier to keep and develop an existing customer than to find new customers. [B] was one of the first with broad logistics offerings in Sweden 20 years ago. Today there are many more alternatives and a tough competition. So, they try to develop the existing customers, but also attract new customers occasionally.

[B] finds that IT is very rarely a problem since they have a capable IT department with good competence. Real-time data exchange works well through EDI, but also via web interfaces for the customer to place orders and check the status. SAP also supported well. IT capabilities are one of their strengths.

Managing individually customized customers is fun and positive for the personnel since it offers variety and a chance to think and learn. It is a strength to manage it, but it is certainly not a case of lean production; sometimes it creates overload. Currently it is a competitive advantage for [B], but they may be approaching a limit.

Insourcing of services has happened once when a big customer converted to an in-house solution after 15 years. This is hard to avoid, but heavy integration and dependence reduces the probability of insourcing when more complex functions are left to the provider. Thresholds for establishing own warehouse are high, considering the large fixed costs of warehouses and personnel. This risk is not a criterion at service offering decisions, though.

When [B] does not offer a service, sometimes subcontractors are used for demand tops (e.g. transport), for rare services (heavy lifts) etc., but [B] remains the common point of contact for customers.

Service development and innovation

Service innovation is initiated primarily by customers, but the management and the board must be involved when starting new services. For example, changing and opening new locations, new VAS creation, etc. Currently, marketing is done via word of mouth. [B] finds that they need to work more with branding and marketing. Innovation motivation comes from literature and articles, customer input, and from subcontractors – they need to be creative to find new ideas.

End customer needs are usually learned via the direct customer since it is easier to deal with them. In communications with customer's customer, there may be a need to have the customer's mandate to make decisions and promises.

[B] looks at different segments and analyzes the profit potential, then decides which segments to pursue, or expand/reduce. Again, all contracts need to make money. [B] gave no indications of targeting specific parts of supply chains based on value system analysis. VAS choices are mostly based on specific customer needs and requests.

VAS have often a large impact in contract negotiations, but for a new customer, [B] usually does not know which VAS may be relevant. They tend to start with basic goods handling and maybe a simple VAS (e.g. labeling, etc.), then over time learn to know the customer and gradually add more complex VAS. It is not uncommon that some VASs are allowed to lose money if they are important for the customer. Profitability maybe counted per customer, not per service.

4.2.3 3PL provider [C]

Company overview

The provider [C] is a large international transport and logistics provider with multiple sites at strategical locations in Sweden. They are in the top three measured by turnover in Sweden, with >250 employees. Warehouse area exceeds several 100 000 m^2. The company emphasizes a green profile. We interviewed the operations manager in the logistics division of the company sites. He has 12 years of experience at the company.

Customer and provider categories

[C] operates in all four 3PL roles. They are a logistics provider, with the role in the matrix determined by the specific contract. They learn what the customer needs/wants and adjust to it. The interview person stated logistics as the core competence of [C].

Customers come from any SC roles that have logistics needs – production, wholesale, retail, or owner of the whole chain. Different industry segments are represented, e.g. automotive, pharmaceutical, fashion, etc. The strength of [C] according to the interview person is being flexible and customizing according to the customer's needs, regardless of its position in the SC.

Some customers have own logistics departments, others do not since they only focus on their own core product. The competence level affects the VAS implementation phase as some customers are not familiar with basic transport setups. After a request "just get it from A to B", [C] can then help figure out the details – loading order, same or next day, cross-docking, bulk or per-package, etc. Many customers have employees with "logistics…" in their job title, but role and knowledge levels differ. For example, a warehouse coordinator can filter and aggregate all info between the customer and [C]. Service offers are based on both customers requesting and [C] proposing services. Sometimes customers know what they need, but often they do not.

VAS types and importance

The service offerings of [C] does usually not include complex service setups that they do not have local know-how for, or that is outside their service scope. For example, fitting tires to wheels is an excellent VAS for [C] at a small scale, but they are not ready to commit to strict KPIs and bonus/malus contracts on a large scale. If specialized additional capacity is required, the threshold for such development is high. The offering criteria also depend on associated risks for [C] and how far outside the main business the risks would lie.

Looking at the list of VAS types in Table 2, the interviewee found that the logistics division in Sweden offers every service type except financial services. All these are part of the portfolio and they are all important since otherwise [C] is not competitive – the VAS set in Table 2 is indeed what the market as a whole expects. But every specific offering contains a small subset of their service scope, depending on the customer's needs. [C] does not go around offering *"what we have"*.

The interviewee summarizes the challenges with all service types as *"anticipating the needs and wants of the customer and delivering according to their wishes"*. A general difficulty is that all customers have peaks in their flow and then logistics gets pushed to its limits. When volumes suddenly increase from RFQ levels, say from 100 to 200 orders, then the solution design no longer works and problems occur, flows break down. Large volumes stretch the capacity and affect quality negatively. E.g. order picking precision drops and there is a high risk of not fulfilling the KPI.

[C] does not use any sub-group classifications of services according to the 3PL role or customer type. Most services may be relevant in all scenarios, all depends on customer needs – these needs and expectations may be basic, or very complex.

From the operational viewpoint, VAS is everything that either is stipulated in contract as a VAS or is outside the scope of the contract. For example, a deviation from a simple logistics solution requesting to take 5 boxes out of a pallet and send to another customer is a VAS in

daily operations. Some VAS is often formally defined in the contract phase. Occasional deviations in the operational phase are seen as additional sales. Extra reliability, speed, security, variable locations may be a VAS, but JIT support, customization of a basic service, transparent tracking, or self-service possibility is not viewed as a VAS for [C].

VAS – e.g. fitting tires and wheels, or performing computer upgrades – is usually not a part of a basic service but still associated with it. 3PL would not be doing these VASs if they would not have a related warehousing contract.

Decision process

The main and (almost) only criterion for the VAS offering decision at [C] is profitability, both for new service development and for customization costs. *"If it is not profitable for us, we won't offer it. If it is sustainable business for us, we try to get the contract."* Profitability can also be counted for the contract as a whole. But political reasons (customer account or business strategy) communicated by higher management may occasionally lead to decisions that are inconsistent with that general principle.

The interviewee told that almost all decision criteria are reduced to a quantitative cost/benefit analysis, including risks to [C] that can be explained in economic terms. Sometimes minimum volume or time requirements may be included, depending on the situation. E.g. when establishing a new storage location where the landlord wants a 5-year guarantee but the customer contract is 3-year, there is a risk of ending up with 2 years of unused storage space. This risk can be quantified and included in the profitability analysis – in 3 years, the profit should be sufficient to cover 2 years of empty space. Or alternatively, [C] can estimate that, after 3 years, the risk of not prolonging the contract is very low, in which case the above 3-year requirement can be relaxed.

[C] sometimes use subcontractors instead of providing the service themselves, mostly for uncommon, non-integrated services.

The interview person's experience is that IT limitations occur often and may be a big problem depending on customer's expectations, e.g. if they desire a tight integration but are not willing to pay for developing it. In general, it is all a question of cost – everything can be arranged but it has to be included in the cost of the contract. It has happened, but not very common, that [C] declines a contract because of insufficient IT functionality.

[C] does not view that the danger of insourcing after customer's competence improvement is a reason not to offer e.g. consulting services. It's simply yet another risk.

Service development and innovation

[C] has recently become better in internal innovation to increase efficiency and to meet customer expectations when their performance is not up to the required level. The interviewee could recognize all innovation modes presented in Figure 7. Both customer-driven and market-driven processes are important. Innovations for a present customer that are required to meet expectations according to the contract have the highest priority. The priority is even higher if this affects many customers. Improvements based on general market assumptions without clear customer input usually do not provide the same benefit in the interviewee's opinion. In general, any potential improvement can be translated to economic terms.

New VAS ideas emerge from kaizen, 6-sigma, lean etc. [C] brings in ideas from employees who are involved in the customer process and encouraged to propose improvements in their areas. Regular process and task improvements can also become a VAS towards a customer. Internal innovation at [C] is measured in time – creating time. E.g. if process A takes 60 minutes but is squeezed into 45 min, there are 15 new minutes available to do something else – e.g. offer a VAS or view as reduced cost due to improved productivity.

It is quite common that a customer starts out with simple services, then develops into something more complex over time as [C]'s capabilities become apparent to the customer. The customer and provider get to know each other and gradually understand possible synergies, operation capabilities, and develop higher trust. E.g. the previously mentioned fitted tires customer is now asking for additional administrative services, allowing [C] to get more integrated into their internal systems. The driver for new services is either that these are the needed (the customer has low competence) or that the customer has seen the provider's capabilities and seeks cost reduction.

VAS refinement over time is about increased efficiency. In a partnership, [C] can go from per-hour billing to fixed price per unit when the service becomes a part of the contract. Additional services outside the contract also have a lower priority – these are done only if time allows. It is a cost reduction driver for the customer and allows better transparency, so customers are motivated to formalize the VAS in the contract.

End customer's needs often drive the required services, but they need to be channeled via [C]'s customer – [C] usually has no service contacts or quality discussions with the end customer.

4.2.4 3PL provider [E]

Company overview

The provider [E] is another large international transport and logistics provider, with headquarters in Western Europe. They have warehouse sites in all largest cities in Sweden, as well as in the Jönköping area. They are in the top ten in Sweden in volumes, the Swedish operations having a size of <150 employees. We interviewed an experienced warehouse manager in the logistics division of one of the company sites.

The strategy of [E] in Northern Europe is to find demanding customers who need VASs. The reason is that salaries in this region are high and [E] is an "expensive" provider. Their idea is to formulate special services to attract customers despite the price, then keep them and their end customers happy. Too high prices must be avoided, which is a challenge since the salaries are high. The pick-pack service is standard, complemented by VAS. Some examples of VAS may be drilling holes, simple assembly, special packaging, and other services requiring additional skills.

A motivation for [E] to establish warehouse sites in the Nordic countries is the customer expectation to have goods delivered the next day. That would be impossible with direct shipping from southern countries. Thus, using [E] warehouses cost some extra for the customer, but allow rapid deliveries and high customer service.

Customer and provider categories

Most customers who use a lot of VAS use complex transport solutions as well – for example packing in Sweden and delivering to the Mediterranean region where a ship picks it up within a 6-hour window. The interviewee likened [E] to an octopus with arms spread out all over the world. The core competence of [E] Global is seamless shipping worldwide – it may include many steps but is transparent to the customer and the shipment maintains the same tracking numbers throughout. Typical services e.g. in Germany are different – more standard services of moving full pallets in-out are more common since margins on simpler services can be kept higher due to lower wages.

The customers of [E] at the site we interviewed are mostly producers, but include also one distributor. Even having just a few customers still means many end customers. Industry segments of electronics, plastic, chemical, construction, etc. are represented.

Relationships and service evolution

[E] always targets long-term relationships since integration costs a lot of time and money. They always require full EDI integration, since this is the only interface that guarantees sufficient quality. Their view is that manual data entry should be avoided since it always goes wrong sooner or later. Usually they seek 2-3 year relationships, which however is not easy to agree with customers who would prefer to leave their options open and keep the contacts to 1-2 years, A 5-year contract is *"exceptionally long"*. Integration costs need to be spread over many years since the customer needs to pay for it. [E] always seeks a partnership, tactical (one-way) relationship is usually a dead end.

The key to developing services is to *"feel the needs of the customer"*. Initially [E] presents a tender (offer and prices), then they meet face to face to agree how to adjust the offer. This is a gradual process, requiring flexible communication, often going beyond formal discussions. Cultural differences make working with some countries easier than with others.

The customers often do not know what they need. Initial requests and offers basically never hold – [E] need to iterate and relate the initial guesses to reality to arrive at realistic agreements. Initial customer data quality is often poor and can only be used to provide an initial estimated price. The actual volumes, requirements, and how to make the customer happy is very different in reality. The final invoice to the customer is often an unpleasant surprise.

[E] considers that meeting end customers is important, either during operations in the supply chain, or visiting them together with the direct customer. They say, *"To know your customer, you need to know the end customer"*. How the customer perceives value is primarily based on how satisfied the customer is, as well as the satisfaction level of their end customer. The customer's increased sales volumes serve as a receipt that the VAS offering is working well.

VAS types and importance

The definition of VAS depends very much on the customer. Basic services are order handling, transport etc. On top of that, anything is possible. The customer may ask [E] to take some packages and *"wrap in golden paper"*, make the parcels extra clean and nice, etc. These tasks are usually charged at an hourly rate. Anything is possible and [E] is happy to do it, as long as the customer is willing to cover the extra costs. In [E]'s view, VAS can be described as services that are not included in the basic contract – the "out of scope" services. Additional, special services can usually be agreed on top of the basic contract.

Some examples of VAS are production services (relabeling, assembly), product displays, promotional material, after sales service, customer service, consulting (customers tend to consider this standard, provider as extra). Product assembly is possible, e.g. preparing kits (several objects into one box, sometimes assembled), postponement as well (e.g. painting or performing a finishing operation in connection to actual delivery). Custom packaging is another form of VAS. Some customers do not know anything about the VAS, they only provide a request that needs to be done, and [E] figures out how. Ultimately, the end customer pays for the service, whether it is performed by the customer or the 3PL provider.

The operational importance of VAS for the provider is generating revenue – whatever the customer needs, [E] can fix it. Customer will be happy if the VAS is performed correctly, with high quality. Then it also develops the relationship and increases trust. Performing a VAS badly is worse than not doing it at all, as it erodes the relationship between the provider and the customer, but also between the customer and its end customer. Quality requires skilled workers and good supervision. Customers are happy with the VAS if their end customer is happy, and if the price is reasonable. *"No news is good news"* regarding messages from the end customer.

To provide a good logistics service, the provider needs to be able to communicate efficiently with the customer, which requires an in-house logistics organization. Otherwise. the warehouse cannot work according to the actual requirements of the customer. If there is no dialog, or if there is a lack of competence on the customer side, the service quality will suffer. The 3PL provider is then making assumptions which may not be true.

[E] can assume different 3PL roles, depending on the customer. All four roles of Figure 5 are represented towards current customers. In [E], transport is the main basic service type (not a VAS), different service packages and customized solutions in the warehousing are the next level, and there is also a capability of full global solution development. VASs are possible for every 3PL role in the matrix. Even basic transport can be associated with additional services if the customer has special needs and the 3PL provider has skilled personnel to perform it. So, in each role, there is additional potential for earning more revenue and making the end customer happier. For the provider, the full solution role is most attractive since the entire chain is in your hands, having full control, full EDI. There is thus a motivation to move towards the upper-right corner.

The 3PL role development over time depends on customer knowledge. Usually they start with warehousing at a smaller scale, grow volumes, develop expertise and knowledge of the personnel, which in turn prepares for realizing openings for new service types and specific VAS. Cooperation between different parts of the global company and sharing competences makes the 3PL role evolution more efficient. In general, internal EDI and tracking functionality development makes it easier to offer more advanced, more complete, more complex services.

Decision process

The service offering is often based on additional services proposed by [E] – they attempt to formulate pro-active proposals. The typical response from the customer is, yes this sounds good, but what would it cost? The key is to offer relevant services that the customer can save money on. In order to grow with the existing customer, the provider needs to learn to know the customer, their needs and ways of working. And the customer needs to come and

see the physical goods flow for themselves, in order to understand the need for changes or new services.

Basically, service offering decision need to balance the time the provider spends and what they can charge. [E] needs to perform their own analysis considering the physical flow in terms of time per item. Hourly rate is the basic calculation unit. If the VAS is new for the customer, they may have no reference to compare to, but otherwise an offer on a service that the customer is familiar with usually cannot be more expensive than the current provision. For larger volumes, [E] can run a short test period to determine the true cost and provide a reasonable, efficient production price for the VAS.

All service offering decisions are based on figures and hard facts. Cost estimates are based on an initial analysis, but re-calculated once a year for all contracts and in all business areas (transport, warehouse, etc.) The company needs to check that they are making money, not losing money. It is important to quantify everything to have real figures (not customer's figures) for analysis and cost planning.

One important non-quantitative factor for the service offering decision at [E] is that no "dangerous" items are handled, neither in assembly or other operations, nor after-sales service. One example of dangerous items is electrical or electronic equipment since these can kill a person and cause liabilities. [E] in Sweden can consult with other parts of the company to utilize previous experience of similar processes to help decide whether or not to offer it. Non-quantifiable factors also include avoiding customers with illegal or immoral intentions – never break the law. One example could be changing lot numbers or best before dates on food products, etc. – a VAS idea that a customer has requested. [E] in Germany also has experiences of being requested services to be utilized for prostitution. Lack of specialist knowledge, e.g. for return handling of some goods types, may be another reason to decline a service request. It takes too long time to develop such expertise and it costs too much to acquire it. However, standard returns handling is a good VAS that does not require special competence.

Environment is talked about, but at the end it is usually the prices and costs, productivity and efficiency that matter. [E] makes sure to have efficient trucks – also a cost cutter – and recycle their materials, but this is not a core focus.

Subcontracting some VAS aspects is an option if [E] does not have in-house skills, but this also removes the margins for that step. Subcontracting in general is widely used, e.g. [E] does not own their truck and forklift fleet since they do not consider mechanical maintenance and driver management a core competence.

Service development and innovation

For innovation, a close connection to the customer is the main prerequisite for realizing what their needs are, so that both the customer and provider can increase revenues: *"It is all about money at the end."* Innovation must happen together with the customer, not based on guesstimated, abstract market expectation. (Internal efficiency improvement is an exception to this principle, but this is about improving existing services, not developing new ones.) New service ideas are almost always based on customer requests.

The interviewee expressed [E]'s market strategy as steadily increasing the volume of 3PL services and obtaining more customers to share each warehouse. This avoids dependence

on any particular customer and their volume fluctuations. The role of VAS is to flatten out the peaks and valleys of the volume fluctuations. Near the peaks, there is not time for additional VAS, while in the valleys, the VASs help produce additional revenue to complement the regular services. It is really the end customer's requirements that determine the VAS needs of [E]'s customers. The end customer's needs can be used as input when proposing new VAS to [E]'s customer. The span of end customer segments covers the entire range.

Complexity management is important for being able to add new services without overwhelming the provider. This is done via customized EDI solutions. Full EDI development is always possible, but may cost a lot. However, once it is done, the differences are captured and the overhead due to different customer needs can be kept low. [E] has extensive experience in such complexity management.

4.2.5 3PL provider [F]

Company overview

The provider [F] is also a global transport and logistics provider, with headquarters in Western Europe but with worldwide representation. They have warehouse sites in and around all largest cities in Sweden, as well as in strategic junctions, as in the Jönköping area. They are one of the largest in Sweden in terms of forwarding and warehousing volumes. Their Swedish operation is large, involving many hundreds of employees. We interviewed the site manager of their 3PL division at the Jönköping site.

The focus area of [F] is providing integrated SC solutions – not just warehousing services, but full solutions including transports, customs handling, etc. They consider warehousing, storage, order picking, and outbound shipping as their core competence. However, this historical core focus is now including VAS to a higher degree.

Customer and provider categories

Customers of [F] are typically big manufacturing companies with international reach. They tend to have quite high logistics competence, make high demands on the provider, and know a lot about logistics. They have outsourced their logistics functions since they want flexibility. Many customers have own logistics organizations, at least some dedicated people, but do not own a lot of resources. They usually know what they want and what [F] should do. All customers' SC role is manufacturer, so [F] helps them to get the goods out to their end customers. Some represented industry segments are industrial, electronics, and automotive.

Typical services that all customers seek are warehousing, order picking, transport planning and outbound transport. As summarized concisely by interviewee, *"We store their goods, they say what to pick, we pick it and send to their customer."* These services build a foundation for customer-specific VAS formulation.

Relationships and service evolution

[F] seeks, and has managed to maintain, customer relationships that are quite long-term. Some customers at the interview site have been with [F] since 1981, and several others 10-15 years. The relationship is based on establishing long-term connections, aligning strategies, and developing the business together.

The needs of the customer are learned through open communication. There exist dedicated personnel both at [F] and customer sides who talk on a daily basis. Additionally, regular production meetings are held to better understand each other's needs and problems. If the communication is good and the provider delivers what they promise, this is a good basis for long-term relationship development. But good operations and service quality is key – there will be no long-term relationship if the customer's expectations are not met.

Sometimes [F] visits end customers to learn their needs, and they also talk to the direct customer. Knowing the end customer is important. The interview person said that they could, and maybe should, have more direct contacts, but usually the instructions from the direct customer are quite detailed and sufficient.

VAS types and importance

VASs of [F] are usually formed based on questions or requests from their customers – for example, *"Could you make a kit for shipping, putting together items A and B?"*. Sometimes [F] themselves propose services, based on previous experience. At the interview site, [F] performs VAS mostly when there is excess capacity, which is not all the time. VASs are related to basic services in the sense that the goods are located at the warehouse in the first-place due to the storage and shipping contract, but they can be only provided based on availability. Some examples of VAS types that [F] offers are production services (mounting tires on wheels, kitting), after-sales and reverse logistics, as well as administrative and IT services.

VASs are important for customers so they can focus on their own competences. They essentially buy logistics flexibility that allows them to add value as late as possible in the supply chain. Services requested depend on the customer's own competence. Usually there is a complementary relation – they buy what they cannot do themselves, but often VAS selection is also a question of logistics flow optimization, not just missing abilities.

[F] classifies themselves mostly in the customer adapter 3PL role for most customers, but they also have some customers for whom they provide planning and full logistics solutions. They can have different roles towards different customers. All customers' services are currently heavily customized and [F] would like to move towards a more standard service set. But this needs to be done so that they still fully serve customer needs, adapt to them.

VAS is interpreted by [F] as service that is part of the contract but creates extra value for the customer and better margins for themselves as the provider. For the customer, the value lies often in being able to postpone value creation in their supply chain. For the provider, VAS provision also contributes to relationship and trust building, and helps learning to know the customer.

Decision process

If the customer requests a certain VAS, [F] makes a serious effort to provide that service at an acceptable price point, in order to continue developing the relationship. Their priority is always to help and serve the customer, but that needs to be done in a profitable manner. If [F] have the capability to fulfill the request, they make an offer quoting a sustainable cost. If required capacity or capability for the service is not available, or the price ends up unreasonable, then they decline to offer the service. They can consider subcontracting where

the service is provided elsewhere. For them, it is important to offer a one-stop shop for the customer, even if some parts of the total package do not generate margins to [F].

Usual contract length is 3-5 years and the scope of services is quite strictly defined during that time. There is not much automatization at the interview site – it is too expensive for the wide range of different services. It also needs to be written off during the contract time, usually 3 years or less, and [F] cannot charge the customer so much. With higher automatization level, there would be more room for innovation; such innovation is happening more in continental Europe.

Service capability limits refer to available floor area, equipment, IT, people with competence, and technical solutions. For example, if the warehouse is full, [F] may simply not have space for performing a VAS, but may have that space a few months later. A contract of 1-2 years cannot justify major new investments in new storage space.

Service development and innovation

In some cases, [F] is taking initiative in offering services, especially with new customers, but usually they work according to customer's needs and desires, showing more a reactive attitude. Sometimes [F] can help the customer determine which parts of the full solution they really need, and which are optional, so that omitting the unnecessary parts can reduce cost.

There are no efforts being made to seek out most profitable stages in the value system; [F] works mostly with manufacturers and focuses on handling of finished goods. They aim at offering as full solution as possible for the distribution step, but not going after the most value-adding stages in the chain. The market strategy of [F] is to pursue long-term relationships, make sure the customers stay, try to meet their specific wishes, reduce cost, and provide good service.

New service ideas are sometimes inspired by ideas from other parts of the global organization, but usually they are based on customer request. The interviewee said that there is not unlimited flexibility and room for creativity in this part of the SC since often *"the products are as they are, and they just need to be sent to the customer"*.

Complexity handling at [F] is based on forming different small organizations for each customer, plus an administrative group for internal resource planning. Every suborganization deals with their own customer which avoids confusion. IT tools WMS and an internal ERP tool help with transparency of the processes. Communication mechanisms and interfaces are time-consuming to set up, but they are not a prohibitive element. [F] in Jönköping has own small IT team on site. More complex EDI configuration tasks are handled centrally or may be outsourced.

4.2.6 3PL provider [G]

Company overview

The provider [G] is a large Nordic forwarding and logistics company that focuses on serving companies in the Nordic countries with warehousing and transport services into Europe and the rest of the world. [G] has several large warehouse sites in Sweden, one of them in Jönköping where the personal interview was held. The Swedish operations of [G] have a size

of >250 employees. We interviewed a business development manager and a regional manager at two different company sites.

The core competence of [G] as a whole is postal service and the parcel network. Both B2B and B2C service groups are represented, where the importance of B2C is constantly increasing due to expanding e-commerce. [G] as a logistics company provides mainly warehousing and forwarding services, but also niche transport services like tempered food transports.

Customer and provider categories

Customers of [G] in Sweden represent all 3PL roles, but predominantly they are manufacturers in Sweden who need to distribute goods within Sweden or out to Europe. Some example segments are food, electronics, and industrial products, but most segments may be found among their customers.

The customers' own logistics competence varies significantly. There are small companies with low competence, as well as large customers (e.g. Husqvarna) who have large experienced logistics teams with formal logistics education that manage buying services, own warehouses, etc. The outsourcing needs also differ significantly – some customer just need warehouse services, others need the whole logistics chain (import handling, warehousing, distribution in the Nordic region, exports etc.). Some customers only need help with a specific transport route or parcel service.

Relationships and service evolution

The range of [G] customer relationships is wide, from customers that spend 1 000 EUR per year to others that spend 10 million EUR. The average customer volume per year is around 100 000 EUR/yr. The services are based on agreements that are usually valid 1-2 years. At least one production meeting is held per 6 months, but [G] talks to their customers every day about bookings, special requests, VAS modifications, etc.

Most major customers have a strategic relationship with [G] which includes strategic meetings together with senior management. Strategic relationships are ideal – [G] prefers a customer that wants to grow and work with them on a long-term basis. This allows larger investments to increase service efficiency. It is harder to be strategic with smaller customers who only send one shipment per month. Those customers mostly seek low prices and can switch to another forwarder if their price is better.

Customers and their needs can be learned in two ways. When [G] receives order bookings and performs services, they get to know the sender (customer) at the daily, operational level. This is addition to the purchasing and sales relationship when the contract is established. [G] also develops relations with goods receivers, the end customers, which makes it easier to provide a well-targeted service. When delivering goods to the end customer, [G] often has direct contact to receive exact instructions that may differ from the customer's instructions. If the end customer is happy, [G] has a more secure position with their immediate customer as well.

VAS types and importance

In general, special VAS requests are related to time (e.g. express delivery or exact time window) or space (specific or flexible place, delivery person, etc.). The most common VAS is to deliver a shipment to a particular location at a specific day/time, e.g. down to Germany, to arrive during a predefined time slot. The planning process then needs to determine the route, the driving time including sleep and rest time, ferry times, make reservations for the ferry, fill the truck with other shipments, and also take into account that there will be additional stops to drop off other goods.

The regional manager used the example of buying a car to characterize VAS offering. Selling the base configuration of the car does not make much money for the manufacturer; the margin is in the add-on features like automatic braking or GPS that make the car safer or more practical to use. Similarly, VAS is where the provider can easier make money (basic transport and warehousing margins are very low), while the customer can make their own operations more efficient. For example, delivering a pallet from A to B is basic service, but delivering it on a specific day or time, or carrying it to the 4th floor, is a VAS. The choice of transport mode can also be a VAS, e.g. paying extra attention to the CO_2 impact.

Regarding service types provided by [G] in Sweden, many advanced services are considered standard nowadays: IT (track and trace, online booking), customer-related services (cross-docking), e-commerce support, etc. Consulting may sometimes also become a basic service, when [G] first needs to explain the service options and educate the customer – here they are already helping the customer with consulting, although it is also in the interest of [G].

Services that are considered VAS are mostly production-related (assembly, labeling), reverse logistics, and some administrative assistance. Labeling is a common service for customers with lower logistics competence. Customs clearance is also a good VAS since it requires special competence that most customers do not have, while not requiring significant physical resources from the provider. Penalties for incorrect customs handling are severe, so customers are willing to pay for having it done right.

Contracting advanced VAS is often associated with limited in-house logistics capabilities – the customer simply lets the provider take care of tasks that they cannot do themselves. But in other cases, it may also be high competence that leads to requesting certain complex services. For example, the customer appreciates the importance of JIT delivery services, but lacks resources for doing it themselves.

3PL role of [G] is usually service developer, but sometimes they also act as customer adapter and full solution provider. Their service offering process usually includes meeting with the customer, presenting their portfolio of services, understanding customer needs, mapping them to the standard service offering, and identifying needs for additional customization and adaptation. It depends on the specific customer needs whether the resulting role is closer to service developer or customer adapter.

Without VAS, [G] would not be very interesting to customers since almost any customer needs at least some of the VAS that they offer. (Similar services can also be offered by competitors of [G].) VASs are therefore a way to earn extra revenue on the existing investments, and also develop trust and advance the 3PL role.

Decision process

A VAS offering decision starts with identifying a specific need by the customer, and formulating an appropriate solution to address it. Customer's needs are always the driving factors. All standard VASs are available to all customers, with a sustainable price attached. If the customer feels that the price is appropriate, they are free to contract the service.

Some services have practical and physical limits, e.g. [G] cannot guarantee multiple delivery time slots on the same vehicle. But business-wise, there are no real limitations. Everything can be translated into costs and if they are acceptable to the customer, [G] can provide the service.

[G] subcontracts services in many cases, e.g. transport to countries where they have no representation. The goal is to provide a transparent and continuous service to the customer. Sometimes, the subcontractors may be the same companies that are [G]'s competitors in other areas. [G] also helps out other forwarders the same way. Although the subcontractor task does not provide a new customer contact, it helps utilize the available capacity and is another way to increase revenues.

Service development and innovation

New services are almost always based on specific customer requests. In some cases, a service previously offered to one customer can also utilized with another, but this is innovation towards that customer, not for [G] as a whole. [G] never develops a new service simply based on a sense that the market may be interested in it.

4.2.7 3PL platform developer [D]

Company overview

[D] is a concept and solution provider of network logistic applications and implementations in Sweden. Their customer base includes logistics (mainly 3PL) service providers and companies from manufacturing, trade, and construction segments. They help improve customers' ability to bundle and integrate services and to extend their networks. They are a provider to 3PL companies of concept development and software applications to enhance the abilities of these 3PL companies in terms of efficiency and service provision. We interviewed an experienced sales and marketing manager at [D] with good insights into the needs and practices of 3PL provider companies related to VAS provision.

[D] offers cloud software platforms that make complex provider/customer networks and relations simpler, enabling industrial efficiency even in unstructured services and relations. This allows customers to offer more efficient and complex services. [D]'s scalable platform helps large and medium-sized logistics companies (e.g. Postnord, DB Schenker, GDL) with complexity management. Each 3PL customer wants the offered services to suit them exactly and each customization is different. One offering will thus become many separate ones, needing separate support and more people. A 3PL service platform helps manage these variations efficiently without exploding the support load.

VAS types and importance

The [D] representative emphasized repeatedly that the key to smooth operation in complex situations is in keeping track of and taking care of the details. This could be a product return situation, a technical support case, or a hardware repair instance, but the common feature

is that in all these scenarios, there is a risk of confusion and letting details fall through the cracks. Therefore, according to the interview person, transparent tracking ability is the most important VAS of the future.

[D] emphasizes two services as particularly important. One is transparency of goods at the article level, well beyond the shipment- or batch-level tracking of today. For example, the customer should be able to request a report "Locate all my green socks" in all packages that contain many colors of socks on different boats, trucks, warehouses or in the back yard. Second is enabling self-service – integration that allows the customer to access relevant info in real time via self-service interfaces. The interviewee likened this to home banking. 3PLs need to be able to present relevant info to their customers via self-service. This creates a stronger connection to the customer. Higher dependency is of course good for the provider.

[D] is well acquainted with complex and large-scope VASs since these are instrumental for 3PLs who seek to improve their service offering levels. The trend is the desire for a 3PL to move from one quadrant in Figure 5 to another, from a low-margin, low profit (basic) 3PL role towards higher margins, more complex services. Some small 3PLs are in distributors only, but most large providers work in all 3 other quadrants.

Regarding classification of 3PL customers, the most important aspect according to the interview person is which problems are they facing, rather than the industry segment. It is their requirements and specific needs that count.

The view of [D] is that it is important for a 3PL to actually perform, not just provide the VAS to the customer. If a service is performed by outside party, the customer/provider connection is not strengthened and the provider does not develop its customer knowledge in the area. Therefore, outsourcing is not a good option for a 3PL.

The question "What is a VAS for you?" was viewed from a more general level by the [D] representative, compared to the interviewed 3PLs. For [D], the main effect of VAS is a more efficient SC. 3PLs are not deliberately helping the SC as such, but they are helping their customers' companies to run better. However, the result is that the SC runs better, too. So, VAS are services that focus on efficiency, on being faster, better, cutting cost, and removing burdens of non-core activities from the customer. A provider must be agile and responsive to the customer needs. VAS depends on what adds value to the customer. The meaning of VAS is changing over time – the minimum level is constantly rising, new layers added as VAS. VASs are almost always tied to basic transport and warehousing, but may also become a pure platform: *"Uber has no cars"*.

VAS makes the client say "yes" instead of "no" (or choose you as he provider, if all else is equally good) – it adds something on top of the standard offering. The provider can therefore accept a loss on the VAS but get profit on the package as a whole.

For a service offering for a customer to succeed, there must also be a sense of urgency from the customer's side: *"If we don't do anything, there will be a problem."* This urgency is required for the change process associated with more advanced VAS to have a chance in the customer organization.

Often customers don't know what they need. A happy customer said to [D], *"You provided us with what we needed, but not at all what we asked for."* From working with many customers, the provider gathers insights that can be reused and offered to new customers. The provider

has to be proactive, propose, come with ideas, then the customer can choose what makes sense. Usually there is no formal value chain thinking behind new service offerings, they tend to be ad hoc.

Many customers today have a slimmed logistics organization and they are interested in advanced, 4PL-like services to keep it slim. The trend towards slimmer customer organizations (downsizing, core activity focus) thus drives the trend towards more advanced 3PL providers. On the other hand, customers with heavy logistics organizations (own purchasing, warehouses, forwarders) tend to outsource more basic services, with "price per km" focus.

Decision process

The decision to offer a VAS to a customer, as well as whether to develop a new service, is always reduced to a cost-benefit analysis. Usually the providers try to avoid "soft factors", but there are always some non-quantifiable aspects. If the account is important and has a long-term influence, are we losing the customer? Can we keep the customer if we don't develop? One element that affects the decision is the provider's market position: If we don't offer the service, will it deteriorate our relationship to the customer? Will someone else offer it to them?

Technical IT integration problems are often obstacles to providing an advanced service. Most info in logistics is still transferred in Excel sheets, and integrating Excel is not easy. Transport and construction industries are the least developed in terms of digital integration. There are two problems – lack of systems and the cost of integration. IT integration is sometimes very expensive compared to the added value.

Increase of customer's competence over time and insourcing is a possible outcome, this is the slim-to-specialist trend, the opposite of the slimming trend discussed above. The two trends are constantly in process, in different directions.

5 Analysis

This chapter analyzes the empirical findings in light of the theoretical frame of reference and develops understanding and a clarifying framework for the guiding principles behind VAS offering decisions by 3PLs.

(In the following, placing [N] after a statement denotes that the information originates from an interview with company [N].)

5.1 Customer categories

Since customer needs are the basis for all service development and offering, we start by discussing different characteristics of 3PL customers and their effect on logistics outsourcing.

The interviews indicate a wide range of customers' in-house logistics capabilities. Some customers manage most of their logistics in-house and only outsource volume services, others have outsourced parts of their previously established logistics functionality, and yet others deliberately avoid any in-house logistics operations [B][D][E]. Many customers have full logistics departments, others only have parts, e.g. a purchasing department. It is common to have at least dedicated logistics coordination personnel that aggregates and filters communication with the 3PL [C]. Customers with slimmed logistics organizations are to a higher degree interested in full-solution, 4PL-like services so that they can keep the in-house logistics support slim [D][F]. Customers with large logistics departments, on the other hand, only tend to outsource individual tasks, e.g. transports, or contract specific advanced VASs, e.g. JIT delivery or specific postponement [G]. Such customers often aim to avoid in-house volume operations where handling demand peaks in uneven order flow requires considerable assets [D]. This tendency was confirmed by multiple interviewed 3PLs and is depicted in Figure 28. It was not confirmed by the 3PL survey but we believe that this can be explained by the way the respondents selected their customer examples (see the discussion of the sampling bias in Sec. 4.1.1).

The competence of customers also varies – some customers are very knowledgeable [F] while others need detailed steering from the provider to define requirements for their services, of even basic ones [B][C]. Sometimes the customer simply lets the provider take care of tasks that they cannot do themselves, either due to lack of competence or resources. VAS outsourcing is often motivated by logistics flow optimization, e.g. the use postponement strategy – which is not to be confused with lacking competence [G]. In fact, contracting advanced services may be a sign of high competence and understanding their potential, e.g. the choice of JIT delivery services [G]. The logistics user surveys (Figure 22) indicate that companies with lower in-house logistics footprint nevertheless classify their logistics competence as medium or high – a small organization does not necessarily mean low competence.

All supply chain roles are represented among 3PL customers – manufacturers, wholesalers, distributors, retailers, as well as full chain owners. However, manufacturers and wholesalers are the most common 3PL customers. In many logistics contexts, customers are referred to as "shippers", so a downstream SC part is implied (e.g. Capgemini, 2016). However, the downstream customer may also be the end customer, e.g. in e-commerce solutions.

The industry segment-based classification is relevant for 3PLs when seeking a strategic focus in the market. Most small and medium providers usually focus on a few segments where the developed service solutions can be reused with limited effort [A][B]. But 3PL services are relevant in all market segments and most VAS types are almost equally applicable in all segments. We discuss this in more detail in Sec. 5.5.

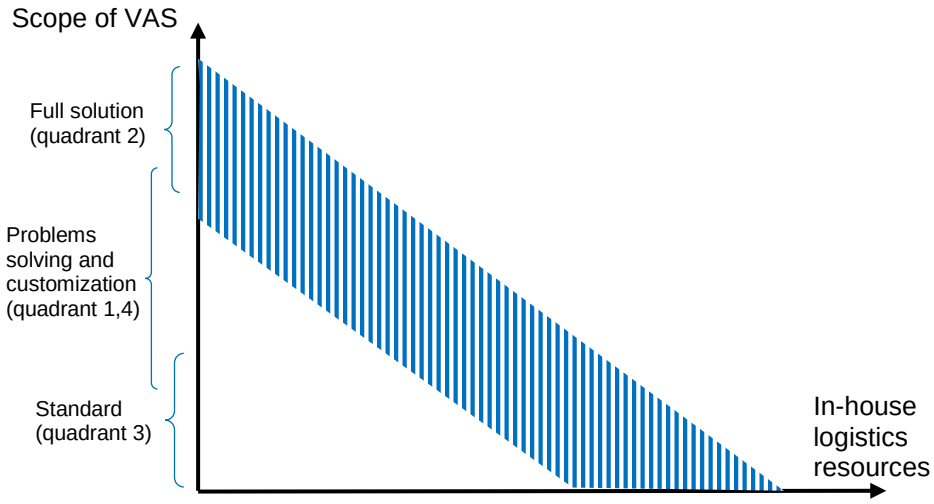

Figure 28: Relation of VAS Scope and Customer's Logistics Organization Size (by authors).

5.2 Provider-customer relationships

Without exception, all interviewed 3PLs preferably seek long-term relationships [A]-[G]. This is expected, based on the advantages of strategic relationships identified by e.g. Bolumole (2003) and the statistics from worldwide 3PL industry studies (Capgemini, 2016). On the other hand, short-term contracts pay more per operation – the customers usually realize that the 3PL must amortize development costs over fewer operations or units handled (Wagner & Franklin, 2008).

Providers we interviewed list many reasons why strategic, long-term relationships are desirable. These relationships allow developing advanced VASs, offer higher margins and profit, and ensure higher integration and dependency for the customer [B][E]. Long-term relationships often mean that the provider gradually obtains access to more information and more control over customer's operations, which in turn enables more efficient logistics solutions [D]. This reflects the advantage of connecting different information flows that relate to goods movements (Aktas & Ulengin, 2005). Logistics efficiency is also increased since more advanced automation and IT solutions may be implemented [F] without worrying that the integration costs need to be amortized during a short contract time, perhaps 1-2 years [E].

The time frames of 3PL provider-customer relationships range from 1-3 months for short-term relationships [B] to 5+ years for strategic [F]. Provider [A] says that they see a trend towards shorter contracts, where 1 year is already a long contract. But even such short relationships have a partnership nature, as required by Skjott-Larsen et al. (2003), to be counted as 3PL. Due to a least some degree of integration, relations of a few months also satisfy the 3PL relationship criteria by van Laarhoven et al. (2000). Arm's length contracts

without any integration are almost non-existent in the 3PLs we interviewed – these only enable simple services and low margins and do not follow the 3PL spirit and definition by Skjott-Larsen et al. (2003) as presented in Sec. 2.5.2. Other providers have many longer-term relations (2-5 years [B], or up to 15-20 years [F]) which allow more strategic planning and cooperation. Comparing the short- and log-term providers, one relevant difference lies in that the shorter contracts are of service development nature, while the longer ones include customers with more integration and customization.

Our logistics user survey complements the data from the interviews and indicates that it is more the large customer companies with dedicated logistics departments that pursue strategic, long-term relationships (Figure 23). Customer companies with limited logistics personnel appear to prefer service partnerships in medium-term time perspective. However, this difference is not heavily pronounced.

In addition to the time frame, another way providers classify relationships is by revenue per customer and year [G]. This is not necessarily directly related to the tactical/strategic classification, but generally strategic customers tend to have larger business volumes as well [G].

5.3 3PL provider roles and their evolution

The study has indicated that, in most cases, an individual 3PL provider as *a company* cannot be classified into one of the 3PL categories formulated by Hertz and Alfredsson (2003). Most interviews, as well as the survey feedback, indicate that the companies support quite different service levels towards different customers [A][B][C][E][F]. So, while the Hertz categorization and other classifications are formulated in terms of a 3PL provider type, we find that in practice it is more appropriate to refer to a *3PL role* that the provider maintains towards a given customer. The characteristics indicated in Figure 5 hold for such roles as well. Mixing different roles makes sense for a 3PL since it is helps maintaining a broad range of customers in different segments, utilizing a wide range of VASs for business robustness [A][F].

The fact that more advanced VASs and 3PL roles offer higher margins is well understood by all providers [A]-[G]. Using Figure 5 as a reference, we find that they work systematically to move the operations away from the lower left corner (basic services) towards the upper right corner (advanced and full solutions) [D]. This is done by continually introducing more advanced services for the customer, which in turn is made possible by the accumulated customer knowledge from a continuously developing relationship [B][E], The full-solution role is naturally more attractive for the provider since the entire chain is in their hands [B][G] – they can have full control over goods flows, utilize full EDI, etc. [E].

Our view of the VAS offering logic in relation to the provider's 3PL role and customer relationship type is summarized in Figure 29. The fundamental goal of the provider is to evolve its 3PL role from the current one towards a desired, more advanced one (Hertz & Alfredsson, 2003), a change denoted by the blue dashed arrow. However, this cannot be done without considering the customer relationship since it determines which VAS the customer is willing to outsource and the provider is able to perform. (Note that the 3PL relationship may be to a large extent determined by basic services that the customer outsources to the provider.) The provider is constantly trying to identify VASs which the current relationship allows, and which in turn allows the relationship and the customer

knowledge to be moved a step further. The VAS offering decision is thus a function of the factors illustrated with the three black arrows: what the current relationship allows, towards which relationship the VAS offering should take the provider, and of course the customer needs, affected by the scenario. The VAS offering choice and existing service availability then determines possible development approaches.

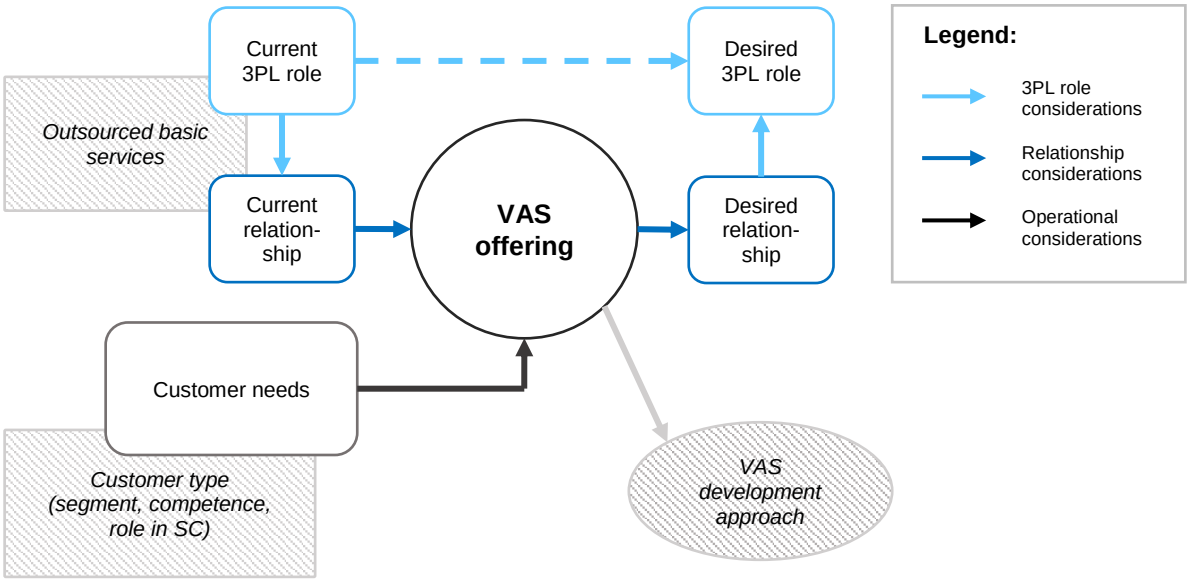

Figure 29: Determining VAS Offering Based On 3PL Role, Relationship, and Customer Needs (by authors).

5.4 Expansion of VAS offering

A common method for existing business expansion is to identify new potential services with the customer, also referred to as developing the customer [B], building on constantly increasing customer knowledge and access to information [A]. A typical approach is to continuously add new services to the existing customer contact as the relationship evolves. Initially the provider starts with the customer's proposed services, then motivates the customer to outsource additional services and functions [A]. The provider performs services that the relationship allows, the range of which increases as the relationship develops [B]. In the process, the customer realizes additional VAS needs and possibilities, or it realizes that the provider has the capability to perform tasks currently performed by the customer them and they can obtain a cost reduction (Bolumole, 2001). A typical progression is to start with basic transport/warehousing and pick-and-pack services, and over time the provider develops insights about additional customer needs even if the customer does not realize them, since the provider can take advantage of experiences accumulated from earlier customers.

VAS development over time includes improvement of existing arrangements (e.g. better labels, adapting package sizes to pallet sizes, etc.) In cases where the VASs are viewed as outside-the-contract services ([C][E]), changing the VAS model from hourly rate to cost/item is desirable for the customer to reduce costs, and to the provider since it implies a steadier relationship and including the VAS in the contract [C]. It is also preferable to include any

frequent ad-hoc services in the contract as VAS to ensure that they have a high priority at provider [C].

Figure 30(a) illustrates the continuous growth of customer knowledge as an enabler for VAS level evolution and more advanced relationships. The interdependency of customer knowledge, relationship level, and feasible VAS level is such that by growing they enable the growth of each other. The supply chain as a whole experiences increased logistics efficiency in the relevant section of the chain.

Customer knowledge is gathered in daily operations and regular operational (e.g. monthly) and strategic (e.g. yearly) meetings [E][F][G]. The provider has an advantage over the customer – they see and handle the goods physically, while the customer often only sees them as objects in their IT system order flow. As said one of the 3PL interview persons, *"One needs to be there to realize things that can be improved"* [B]. Communication is further facilitated if some of the customer's personnel works on the provider's location [B].

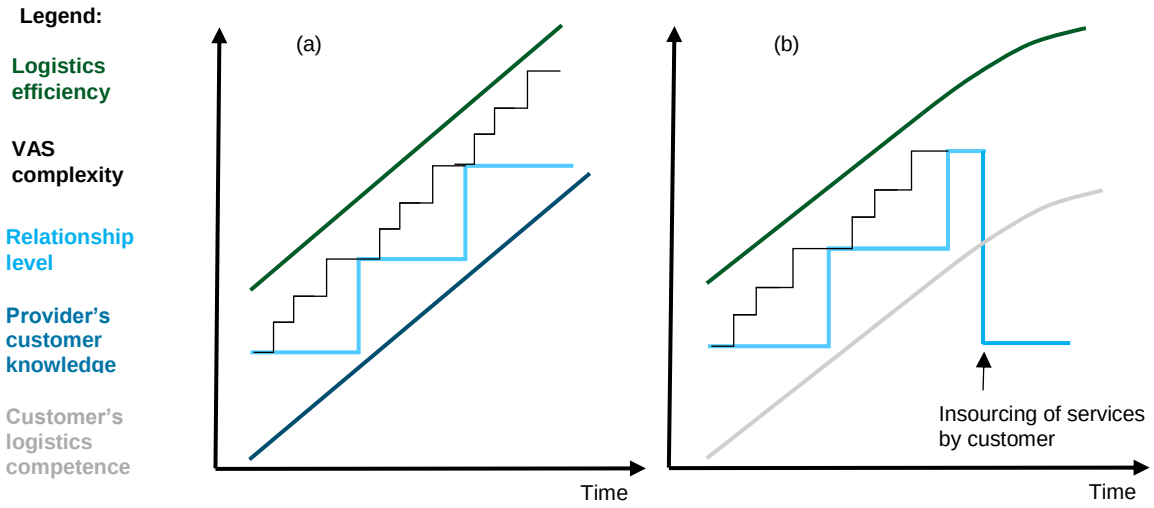

Figure 30: Progression of VAS Over Time: Increasing Outsourcing (a) Or Insourcing (b) (by authors).

Some 3PL companies also have systematic contacts with end customers [A][E][G] to obtain information about their needs and requirements. However, usually providers rely on their immediate customers to communicate the end customers' needs. This process is depicted in Figure 31, illustrating the unintentional but nevertheless undesired filtering of the end customer's requirements and expectations regarding the logistics services via the direct customer's communication (solid gray line). We propose that a direct contact model (dashed gray line) could be used more. The goal of the provider is to make their customer successful by helping satisfy the needs of the end customer. Via the direct contact, the provider may pick up additional relevant info that the direct customer misses. As says [E], satisfaction of the end customer leads to a more satisfied logistics customer as well, and the end customer's needs can be used as input when proposing new VASs to [E]'s customer. Also, if the end customer is happy, the provider has a more secure position with their immediate customer as well [G].

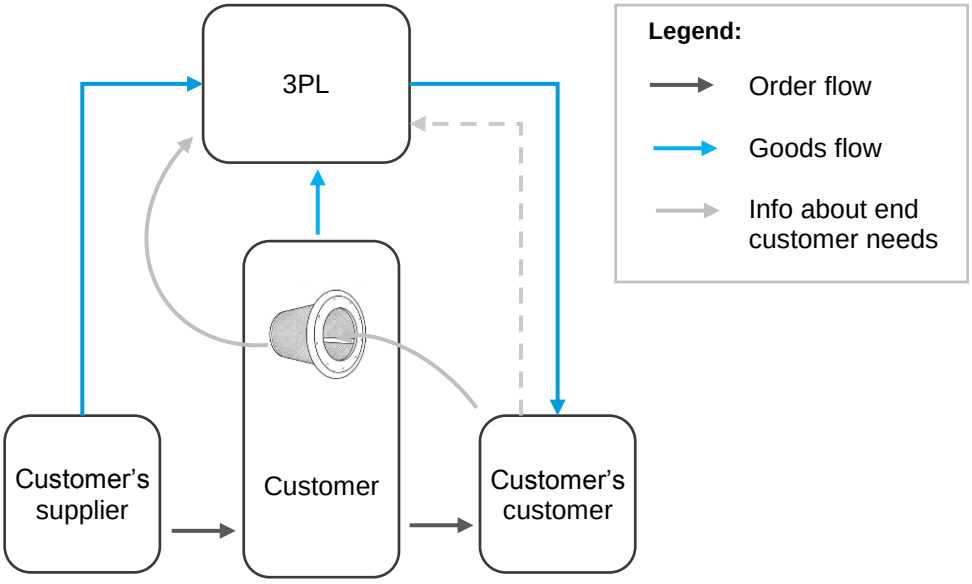

Figure 31: Indirect and Direct Input from End Customer (by authors).

A potential flip side of developing a close relationship and providing advanced VASs to the customer is that the customer also has a chance to develop their own logistics competence. In some cases, as depicted in Figure 30(b), the customer may insource groups of advanced VASs and revert to a lower outsourced service level. The threshold for insourcing is usually high since the customer incurs additional fixed costs (Persson & Virum, 2001) and needs to handle demand peaks [B]. But for customers for whom logistics has a high strategic importance, insourcing may be favorable (Parashkevova, 2007).

Our interviews indicated that instances of insourcing did exist but were quite rare, and the insourcing risk was nothing that affected VAS offering decisions [B][E]. The infrequent experience of our interview subjects with insourcing is somewhat in conflict with the global 3PL trend report (Capgemini, 2016) where both outsourcing and insourcing occur in large volumes, although outsourcing levels are higher.

5.5 VAS types and the importance of VAS

Just like there exist numerous theoretical VAS definitions, we also found varying views on what VAS is in practice. From the business development perspective, VASs are often seen as non-standard services that require customer-specific development, so the definition depends on the provider's existing scope and capabilities – an advanced provider may offer certain relatively complex VASs as part of their standard portfolio. In general, many of the services that the literature considers a VAS are now viewed as standard services by providers, e.g. the pick-and-pack service. The services that the providers today view as VAS are relatively more advanced [G].

From the operational perspective, especially at large 3PL providers [C][E], VAS may be viewed as anything that is not included in the contract and provided as extra, per-request or "out of scope" services. These then become additional sales for the provider. However, at [F], the VASs are part of the contract but create extra value to the customer. The definition

thus depends on the provider and is more heuristic than the one proposed by Berglund (2000) and presented in Sec. 2.5.5.

The provider view is in some cases that VAS are optional services that the customer could either do themselves or skip, but the customer lets a 3PL perform them since this results in an efficiency gain [B]. A good example of this is importing goods in flat packages from China. The customer could ship the goods from China ready assembled, but if the assembly option is available by the 3PL, it adds value to the customer by dramatically reducing transport costs [B]. In contrast, the basic transport or warehousing logistics services are not optional.

There are many reasons why providers view the VAS as extremely valuable. All interviewees emphasize the profitability and high margins [A]-[G]. VAS is also commonly seen as something that differentiates the 3PL, i.e. makes the customer choose that provider. [G] said that VAS makes them "much more interesting" to customers. [E] considers themselves an "expensive" provider, but they use VAS to attract customers despite the price. Yet another advantage is that VAS helps flatten out the peaks and valleys of basic service revenue fluctuations [E].

The fundamental function of VAS provision is creating a more efficient supply chain (Soinio, 2010), which was also emphasized in the interview by [D] Better and more relevant VAS help the SC actor companies run more efficiently, and by doing that they lubricate the chain as a whole. So, ultimately, VAS is what adds value to the end customer. The need for VAS has increased over time since supply chains of today function more as "pull" by the end customer than "push" by the producer, with short lead times and cost focus [B]. VAS must therefore work backwards from the needs of the end customer.

Different VASs have their specific challenges, but a common difficulty for most services is uneven flows and handling temporary peaks in demand [B][C]. If the demand increases above the level the service is designed for, the processes start to break down and the service quality and the KPIs are degraded. The exact formal consequences of such events depend on the contract, but the provider-customer relationship is likely damaged (Wallenburg, 2009).

5.6 Relation of VAS to base services

VASs are almost always associated with base services. Especially warehousing can be seen as the foundation service for 3PLs [A]. A flow that fits many scenarios contains the steps of inbound transport and goods reception, storage, some additional services, and outbound transport, depicted in Figure 32. Then, associated with each step of the base process (white) and between them, additional VAS (blue) may be attached. The VAS may constitute administrative support services, contribute to processing in the warehouse flow, as well as add additional goods flow alternatives. While the shown VAS are only limited examples, the flow view clearly illustrates how the VAS are derived from and associated with basic operations in the logistics flow.

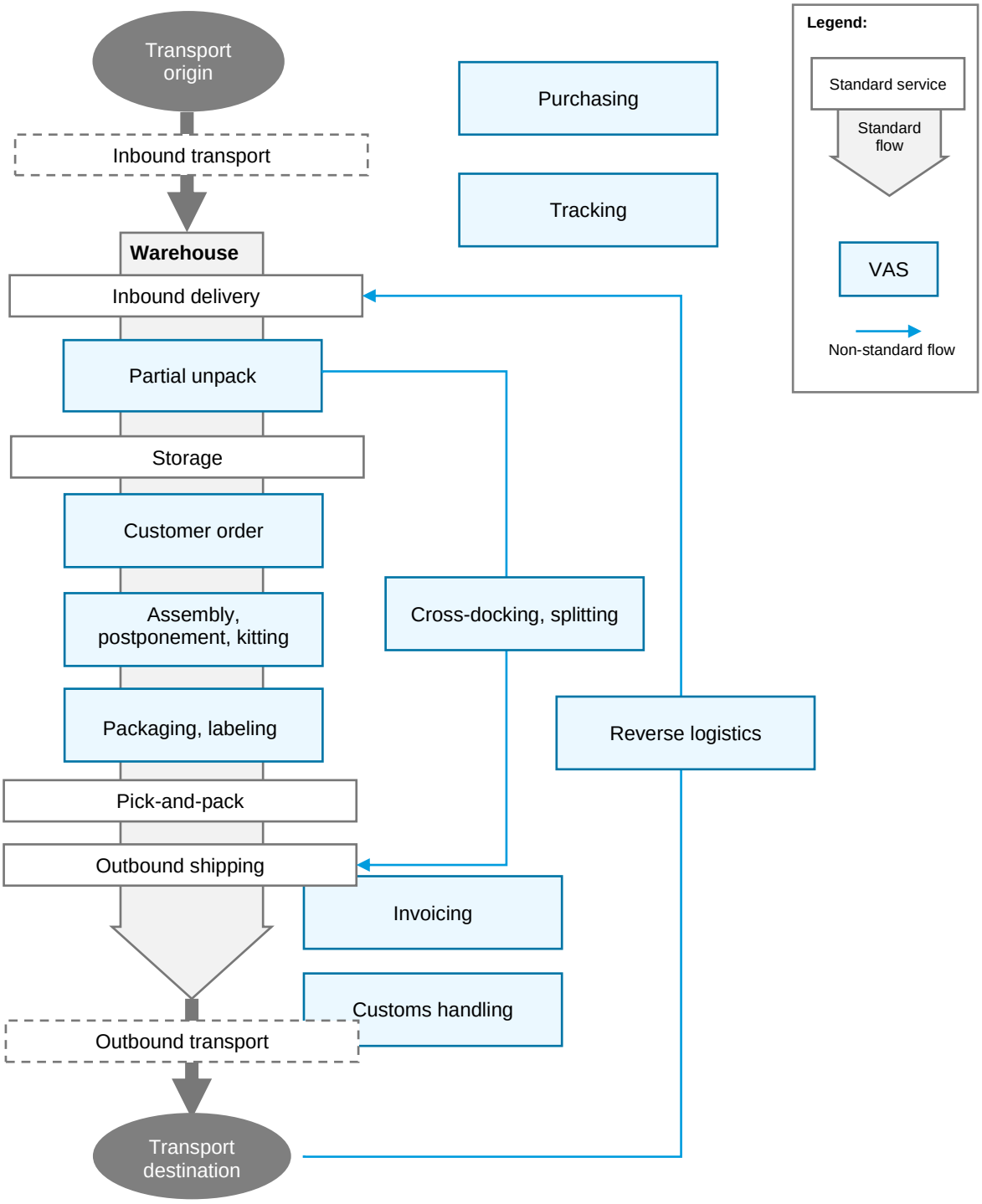

Figure 32: Example Logistics Process Flow and Example VAS (by authors).

The dependence of VAS on base services (e.g. when assembly of goods as a service is enabled by the underlying warehousing service), as well as advanced VAS dependence on simpler VAS, can be visualized as a tree (Figure 33) where the trunk supports the branches and the branches support the twigs. Trunk alone does not give effective shelter and is not particularly nice to look at. Similarly, base services alone do not guarantee success; the 3PL provider also needs the "branches" and the "twigs" – it is often the ability to offer advanced VAS that makes a 3PL firm flourish.

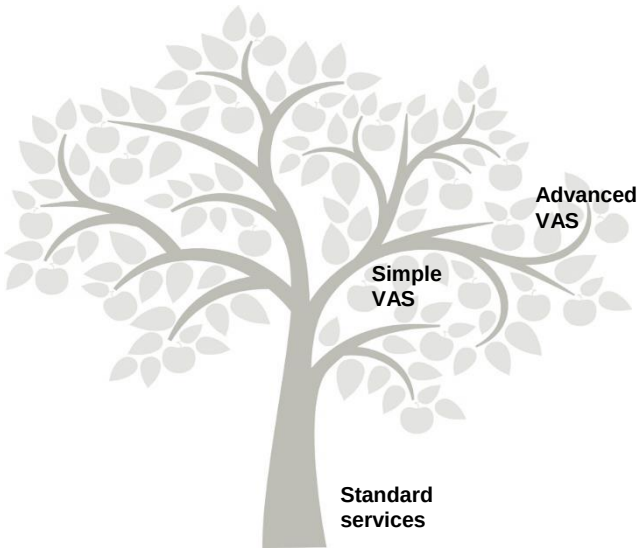

Figure 33: VAS as Branches of The Tree. (Inspired by [B]. Image: https://www.haversteam.com).

The only counter-example to the tree view we encountered was given by [B] where their IT system was used for monitoring transports that were not arranged by them and did not pass through their warehouses. This was noted as an exception in our practical observations. However, the 3PL platform developer we interviewed believes that the future VAS trend is likely to go towards non-asset-based services, constituting pure logistics service platforms that do not require touching a physical goods flow [D] – likened to Uber as a carless transport platform.

5.7 Mapping logistics scenarios to VAS offering

One of the research questions dealt with which VAS types are relevant in which logistics scenarios. Since a logistics scenario may be defined according to multiple classifications of the 3PL, the customer, and the relationship, the number of possible combinations is high. Table 9 partially summarizes the conclusions from the interviews and Table 8 in the provider survey. It presents typical occurrences of common VASs, depending on customer's logistics competence and supply chain role. The 3PL role of the provider is here roughly implied by the customer's logistics resources field, due to the relationship presented in Figure 28. The VAS offering distribution depending on the 3PL type of the company was investigated in the provider questionnaire and presented in Table 7. Transport and warehousing services are relevant to all customer categories. (A closer description of the VAS categories is given in Sec. 2.5.5.)

The VAS offering vs. scenario formulation could also be attempted for the customer segment classification, but the study has indicated that most VAS groups are relevant in most segments, and most scenarios in general. (Certain VAS and scenario combinations that are intuitively irrelevant may be excluded, e.g. administrative services to a customer with a full logistics organization). Specific services to be provided depend on the specific customer needs. Therefore, in our opinion, the most relevant classification of customers would in fact be made according to which problems they are facing, their requirements and needs. While this is in principle possible, it would require obtaining information from cooperating provider-customer pairs which is outside the scope of the study.

VAS type	Customer's logistics competence			Customer's SC role		
	Slim	Medium	High	Manufac-turer	Wholesaler/ distributor	Retailer
IT	X	X		X	X	X
Product-related	X	X	X	X	X	X
Customer-focused	X	X		X	X	X
E-commerce	X	X			X	X
Promotional	X			X	X	
Reverse logistics	X	X	X	X		X
Administrative	X			X	X	X
Customer service	X			X		X
Consulting	X	X	X	X	X	X
Financial	X	X	X	X	X	X

Table 9: VAS Applicability to Different Customer Types (by authors).

5.8 Decision process

The general rule of any service provider is to offer what the customer desires and needs, but the reality is rarely that simple. The provider needs to consider the real benefits to the customer and the impact for the provider [E][F]. In some cases, certain functions add limited value to the customer but a large cost for the provider – there is a strong cost/price imbalance [B]. For example, some additional tracking or data exchange features in IT solutions may be very expensive compared to their added value [D][B]. The provider thus needs to perform a further analysis before a decision can be taken.

Identifying new services

Based on the empirical material, we have in Figure 34 formulated a decision process that captures the essential elements of VAS offer determination. The first step is to identify a suitable candidate service. Its source may be a customer request or Request for Quotation (RFQ), or the provider's insight for improvements. Linking back to the 3PL role evolution goal in Figure 29, it may also be an identified desire to develop a closer relationship with the customer. In most cases, the new offer is related to an existing service; only a very small fraction of offers is associated with developing a new service for the customer (Figure 20).

In our provider survey, in about 2/3 of the cases, the service was initiated by the customer and in 1/3 of the cases by the provider. The logistics customer survey suggests that the providers drive new services even less frequently, in less than 1/4 of the cases (Figure 24).

Many providers say that many of their customers do not know exactly what they need [A][B][C][E][G], while [F] reports that their customers are mostly large companies with relatively good competence that usually know the solution that they require and what [F] should do. However, [F] sometimes helps the customer determine which parts of the full solution could be omitted to reduce cost. [G] works towards specific customer requests. It

is always the customer's needs, not *"what the 3PL has"* that determine the services [C]. Selling something to the customer that is not a good fit is not a modern 3PL approach [C].

The potential of the service as a value-added feature for the customer is then analyzed – can the provider perform the task better than the customer according to some relevant metric? This is a fundamental question in all outsourcing relationships (Scott, Lundgren & Thompson, 2011). Efficiency to the customer comes from volume processing and faster execution by the provider, compared to what the customer can manage on their own [A][B], but also due to finalizing the product later in the supply chain [E]. This creates the added value for the customer and a profit potential for the provider.

Profitability analysis and soft factors

The next step, profitability analysis, is often seen as the core of the decision process. It is expected from generic service offering literature (Grönroos, 2000) that profitability is the fundamental criterion for making a VAS offering decision. This was also universally expressed in the interviews: profitability comes first and foremost. *"If we cannot be profitable on it, we won't offer it"* [C].

The providers we interviewed always attempt to quantify everything that is relevant for the profitability (cost/benefit) analysis. This includes all direct costs to the provider (asset and competence development, customization, operation, storage space, personnel, etc.) and planned revenue (depending on the expected rates, volumes, and contract length with the customer). Contract length and volume minimums are defined so that development costs can be amortized [A][B][C][F], in accordance with Wagner & Franklin (2008). Often development costs can be divided over several customers, or shared with the customer, or resources may be borrowed from the customer to reduce costs [A][B]. IT systems integration is often a large part of the costs. All risks that can be quantified are also included. Risks appear to be commonly interpreted according to the principle "even when the risk event happens, we must be profitable" [C]. Our empirical information thus suggests worst-case planning in most cases, few probabilistic computations.

Pricing the service offer is a delicate balance between ensuring sufficient profit and remaining attractive to the customer. Furthermore, the initial volume and requirement estimates by customers are almost always wrong [C][E]. As explains [E], unless the service is new to the customer, the quoted price cannot be higher than the cost of their current arrangement. Sometimes [E] runs a short test period to find out the true operations cost for a service and offer a reasonable, efficient production price for the VAS.

The goal in the decision process is usually to include all relevant factors in the profitability analysis, so that no major decision factor is excluded [C][D]. However, several 3PLs told us the interviews that there are inevitably soft factors that cannot easily be numerically calculated but must be taken into account qualitatively in the decision process. Some examples of such factors at the operational level are additional, non-quantifiable risks (e.g. theft-prone shipments), different regulations and certifications for certain goods types (e.g. hazardous materials), and qualitative assessment whether sufficient quality and agility [A] can be maintained towards the customer.

In addition to the operational non-quantifiable factors, some similar soft factors also arise at the strategic level. Some examples are potential positive or negative impact to the 3PL company image (e.g. green profile or moral considerations of certain goods), an opportunity

to try out new service types of potentially large value in the future, or considerations tied to the customer relationship and 3PL role evolution. Major development decisions (e.g. opening new sites, involvement in new segments) also require management approval.

Based on the formal profitability analysis and the additional soft factors, an offering decision for the service or customization is taken. If the service will be offered, development starts. If not, the process repeats after identifying new service opportunities, since service development is an ongoing, cyclic process.

Service offering examples

Since we started this section with the statement that the provider generally attempts to offer the services that the customer requires, we will offer give some explicit examples about when the 3PL should not offer a requested service. A lack of profitability is clearly such reason, as well as risks and regulations mentioned above. Several 3PLs also mentioned company culture differences and a lack of a sense of urgency for the new service in the customer's organization [B][D]. The importance of such soft factors in establishing and developing service partnerships is emphasized by Lee & Cavusgil (2006). Another reason to not offer a service may be the lack of IT tools for customer management, and the unwillingness of the customer to accept a rate that would accommodate the development of such platform. Low headroom for handling peaks in order flow [A][B] may also be something that the customer may be willing to downplay in the contract, but service quality problems in such situations may severely damage the relationship. In general, handing large product volumes in simpler VASs is a challenge that smaller 3PLs often say no to [A], and instead let larger 3PLs take such customers. Some providers choose not to get involved in services that can lead to legal liability (e.g. electronics assembly, [E]) and most say that illegal actions are strictly excluded (e.g. a request to relabel expired food items with later best-before dates, [E]). While it may be possible to develop the required solution, volume production may unduly change the company focus and develop excessive dependence on a single customer [B]. Potential insourcing after learning from the provider is mentioned as a risk in the literature (Bolumole, 2003; Capgemini, 2016), but the risk is hard to quantify and is not a common factor in service offering decisions according to our results. Yet another consideration is the service quality that can be offered within the customer's budget – often it is better to decline to perform a service than to do it badly since it damages the customer relationship [E]. But overall, the 3PLs, especially smaller ones, [A] quite seldom say no to a feasible service request since all business opportunities are pursued; they typically always look for a solution and a compromise.

The opposite question may also be posed: Are there cases when a service will be offered although it is unprofitable? A common example is including an unprofitable service in the contract if that makes the customer happy and helps develop the positive relationship, which in turn facilitates the 3PL role evolution. (The contract as a whole must of course be profitable.) This is something that all interviewed 3PLs occasionally do. An opportunity to test a new service on a small scale and obtain experience before a larger-scale launch may also motivate offering an unprofitable service in limited scope and volumes [B]. Engaging with a new startup customer that can become a major customer with a long-term relationship in the future is another [B].

Large-scope, established 3PLs are very case-oriented – their capabilities already exist, offering a service to a customer it is usually a question of picking suitable capabilities out of

the existing list and proposing a setup that is profitable [C][F][G]. New service development is required relatively rarely, as also exemplified by the provider survey (Figure 20.). Their starting point is that most requested services are possible, as long as all costs are accounted for in the profitability analysis [C].

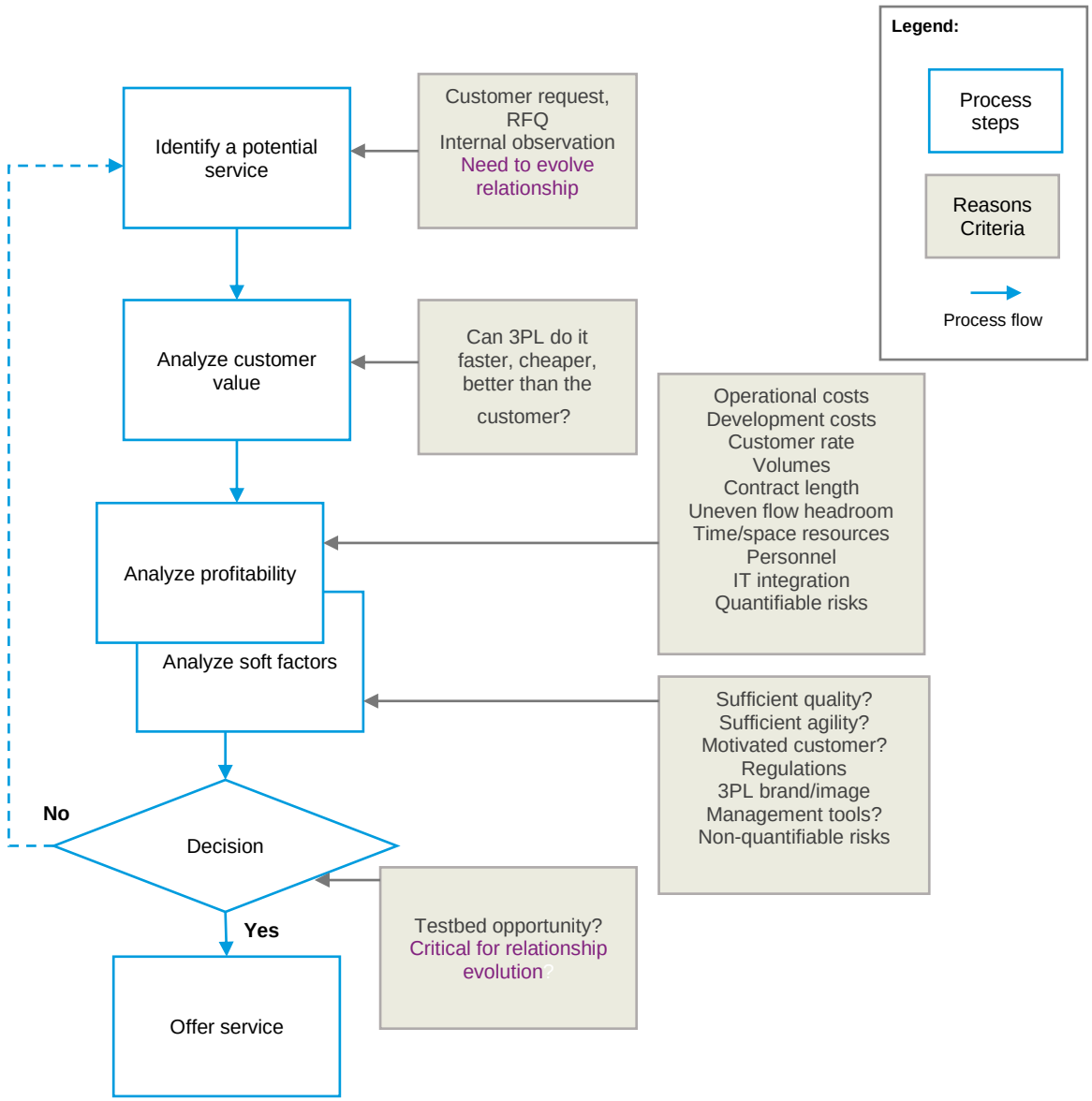

Figure 34: Decision Process for VAS Offering (by authors).

Subcontracting by 3PLs

When a 3PL wants to provide a service, e.g. a VAS, to their customer but is unable or unwilling to perform it, the 3PL can in turn outsource it to a subcontractor in some cases. Sub-contractors are usually used for simpler services like packaging or transports [A][B][F]. The main motivations for subcontracting are to provide a service that the 3PL expects to be too rare to develop an internal solution, or to handle demand peaks that exceed their own

capacity. Permanently subcontracting a recurring service towards a customer is usually not a good idea. The customer is then not tied to the 3PL but its subcontractor and can relatively easily change the 3PL if the subcontractor agrees to follow [D]. For large 3PLs with a large potential customer base, the concern appears to be smaller and the threshold for utilizing a subcontractor is lower. For example, [C] uses subcontractors frequently for services that do not require integration. The use of subcontractors is often motivated by the fact that the customer expects a single point of order for all services, so it is advantageous to say yes to the service request, even if someone else earns money on it [F]. Providers subcontracting some VAS by is conceptually different from the situation when they outsource resources-intensive tasks while maintaining the operational control. For example, [E] does not own their truck and forklift fleet but has outsourced all truck and driver management.

5.9 Service innovation and development

The interviewed 3PL providers report that most service innovation ideas come from the analysis of existing services, from input from personnel working with current services, and from increased knowledge of customer needs as the relationship evolves, in agreement with findings of Wagner and Franklin (2008). (Large 3PLs have formal processes for kaizen, 6-sigma, and lean, and internal personal innovation goals are set for employees [C].) New ideas are often derived from existing solutions or previous customer experience as a starting point. The interviewees also told that innovation input comes from many additional sources: market analysis, the web, literature [B], conventions, and seminars [A] are used to identify new areas and potential services. These channels also help find new customers.

Both interviews and surveys indicate that customer-oriented innovation is most common – the aim is to meet existing requirements or expectations from an existing customer, or to prepare for additional services to offer to them. If multiple customers have the same service needs, this innovation model it is even more important. General market-driven innovation may also be valuable, even if no specific customer input is not available, but the return for investment, at least short-term, is usually lower [C]. Some providers never introduce new services without a concrete customer interest. Our 3PL provider survey results on innovation drivers (Figure 18) suggest that pure market-driven innovation is quite rare in practice, occurring in only about one third of all cases. Our empirical data thus differs from the conclusion of Wallenburg (2009) that pro-active (i.e. market-oriented) innovation is crucial for maintaining a competitive advantage; at least it is not viewed as such by our respondents. However, for 3PLs with a global reach and many customers, customer-driven innovation naturally matches general market expectations.

One important aspect of service innovation and development is improving complexity management. Efficiency in service provisioning and the ability to manage customers individually is critical for handling numerous different services to different customers, as is the case for customer adapter 3PLs, and to provide complex services efficiently [D][E]. In areas like return management and administrative services, complexity handling is particularly important [B]. Without such systems in place, further innovation and business growth is not possible. [D][F].

Most interviewees [D][E][F][G] indicated that most efficient complexity management is achieved via automated and easily configurable IT tools that minimize the need for manual intervention and integrate all relevant information about goods in different phases of the logistics flow. [E] always requires full EDI interfaces in all customer setups. However, smaller

3PLs may not able to afford full EDI solutions in all cases [A], and even large providers may have a more low-tech solution to addressing complexity. A different approach is taken by [F] that uses dedicated work groups where every suborganization deals only with their own customer.

One increasingly required feature is increased transparency and traceability at the item level, as well as self-service functionality that allow the customers to retrieve relevant information with low overhead to the provider [D]. Therefore, while the service platform development may not result in immediate new service offers to customers, it is a prerequisite for sustainable growth of the VAS offering and for providing the transparency tools that the customers expect and demand [D].

The fundamental goal of service innovation is to move towards more profitable VASs, away from standard, low-margin offerings [D]. Using the Hertz model (Figure 5), this is equivalent to moving from the lower-left towards the upper-right corner. The same principle may also be recognized in other LSP classifications: moving from asset-based to asset-independent operation in Figure 4 (Persson & Virum, 2001), and increasing the scope of services and the degree of customization in Figure 6 (Stefansson, 2006). This is also the trend captured in all 3PL interviews where the respondents express a constant drive towards more advanced VAS service levels as their customer experience grows. These are thus two sides of the same process: to learn about which VAS the customer can take advantage of, and prepare the 3PL capability and capacity to be able to provide them.

5.10 VAS offering in the light of Porter's theories

The value chain, value system (Porter, 1985), and generic strategies (Porter, 1980) frameworks support various aspects that are relevant to VAS offering decisions by 3PL providers. These include identification of activities with high value-added contents to capture as large fraction as possible of the total available margin, prioritization of internal efficiency or external effectiveness in the company, and identifying primary and supporting functions for value creation.

However, our empirical material suggests that the 3PL companies often do not build their strategic service offering decisions on such frameworks and may therefore not make optimal decisions in their VAS areas. Our interviews indicate that providers predominantly choose the services to offer on a rather ad-hoc basis, analyzing the operational situation and specific trends for the customer at hand. They do consider experiences from earlier similar customers within the customer's activity range – their local value chain – that helps improve the competitiveness of the customer. But we did not find efforts to locate favorable VASs within the supply chain flow as a whole and using this info to pursue new VAS areas. Thus, we found no indication of formal value system approach along the lines of Porter (1985). We expect that applying value system thinking to the supply chain as a whole may help the 3PL to better identify VAS opportunities outside the already established customer relations.

Taking a narrower view of value chain thinking that only includes the provider's internal activities towards a certain customer, the picture from the interviews is more encouraging. The 3PL know their internal processes and their value potential very well. The primary value-adding activities are thoroughly monitored [B][C][E] and many providers appear to be using support functions that are well suited for the established operational context, although they do not formally think in terms of the internal value chains [A][E][F].

Interview answers also revealed that strategy in the VAS offering context is typically not perceived in terms of the generic strategies (differentiation/cost leader/focus) of Porter (1980), but rather in terms of value propositions (e.g. service quality and flexibility, safety, "right" pricing, etc.) [A]. Even after discussing the list of generic strategies, one provider could not identify one of them as primary for their company [F]. This may indicate a lack of conscious prioritization between the cost leadership and differentiation strategies, which, according to Porter (1980) is necessary for creating a robust competitive advantage – mixing elements of both may not lead to sustainable success. On the other hand, it may suggest that the generic strategies framework may be overly simplified and difficult to apply for large companies that are involved in many different logistics scenarios.

The value chain and value system view provides one way to illuminate how VASs have a potential for boosting the competitive advantage of the SC as a whole, of the customer company, and the 3PL provider company. This relationship is depicted in Figure 35. The relationship is presented in terms of the driving forces from the 3PL provider and customer sides, the VAS offering decision and development process, and the resulting benefits. As may be seen, the value system, value chain, and strategy principles can guide the process in all its stages. Our findings suggest that the value system and generic strategy thinking is not utilized by the providers to their full potential; instead more ad hoc assessments are used. Value chain considerations of internal activities of the provider were, on the other hand, observed throughout.

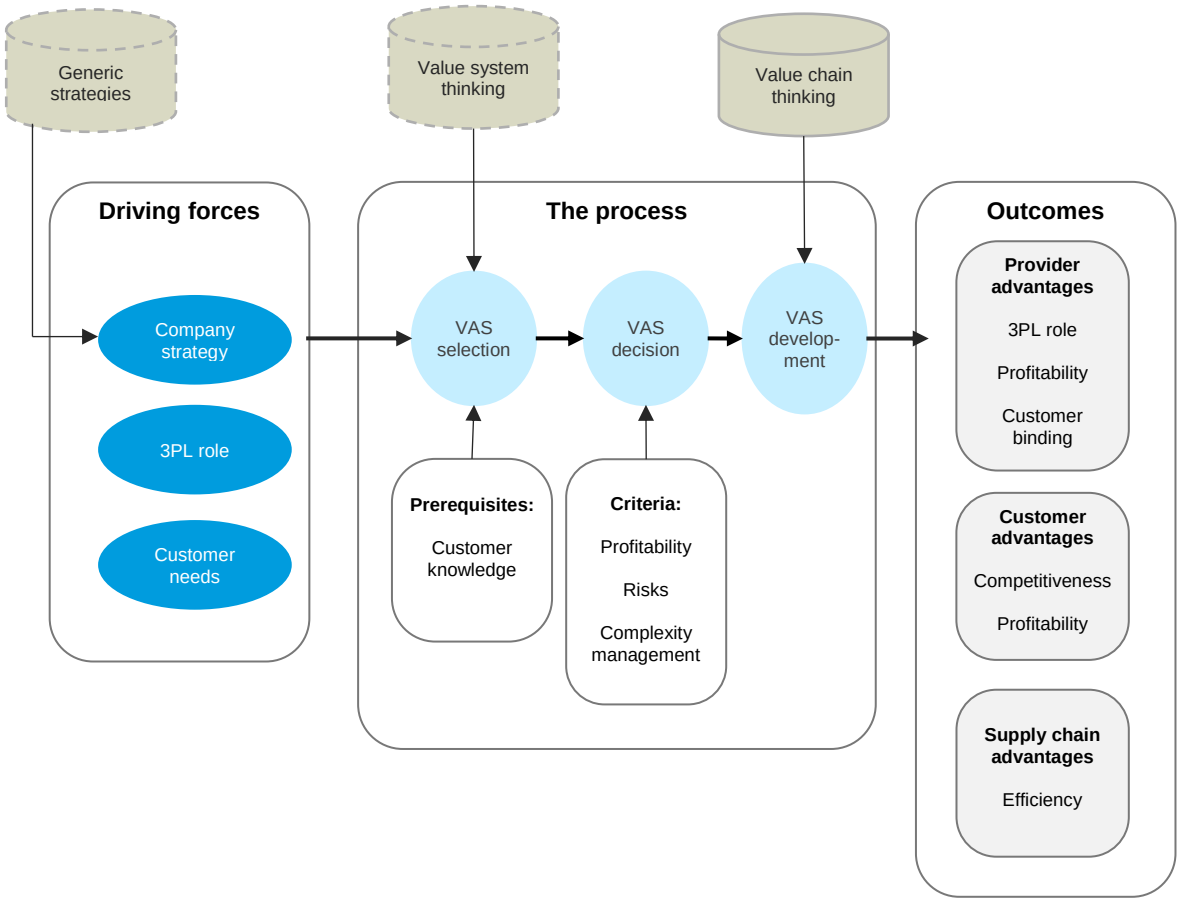

Figure 35: Value Chain and Value System View for Competitive Edge at Different Levels (by authors).

5.11 Managerial and strategic aspects

For large 3PLs, it is essential to offer all VAS categories, since they target the broad market and all these service types are expected by some parts of the market [C]. However, smaller 3PLs consciously limit the scope of VAS, applying a focus strategy to certain segments. Subsequent new segment entry is easier into segments where the relevant VAS set is similar. Another motivation is to engage in segments where large players do not have the required detailed know-how [B]. Smaller providers cannot have cost as the main advantage due to limited volumes; the large, cost-sensitive flows with low margins are often let to the large 3PLs [B].

Handling individually customized customers is a challenge. Customer adapter-type 3PLs turn this capability into their strength [B][F]. Their strategy must then be expressed as differentiation via adaptation; the cost leader approach is not appropriate. In general, we see that all 3PLs roles (except the standard provider) compete with their services, not the price. This is consistent with the non-commodity nature of the more advanced VAS categories (Grönroos, 2000).

In the total offering context, VASs have the role of providing the "extra" that helps the provider to attract the customer into a relationship – show competence, show empathy, develop trust, show the desire for win/win solutions. *"We can be profitable providing services that allow you to make money."* [A]. The VAS components become more important for keeping and evolving the customer relationships, the longer their joint history is [B][F].

In pricing, VAS usually yield a larger margin than base services, but this margin is also required to ensure quality. Our interview subjects showed frustration over many customers who lack this insight, as also stated e.g. by Szymankiewicz (1994). Too hard bargaining leads to inferior quality of the offering and "breaks" the service, with negative consequences to both parties. Maintaining service quality is a prerequisite for customer loyalty (Wallenburg, 2009).

6 Conclusions and discussion

This chapter wraps up the thesis. We summarize and reflect on the key findings from the analysis, outline our contributions to the 3PL body of knowledge, and discuss the limitations of the study and possibilities for future research.

6.1 Conclusions

This thesis study has focused on VAS offering by 3PL providers. Many observed VAS offering principles are fundamentally similar to augmented service offering principles in the generic service offering context. VASs are dependent on core services and may be optional for the customer, but can be used to make the total offer more attractive and significantly increase the profitability of a customer contract as a whole. Some elements that distinguish logistics as a field from the generic context are the diversity of services, customer needs, and their combinations, the special focus on cost and speed of execution, and fierce competition. These characteristics have been reflected throughout in the empirical material we gathered and the discussion in the analysis chapter.

The work has addressed the research purpose stated in the introductory chapter:

Develop an understanding of how a 3PL determines which value-added services or service customizations can be favorable, and which customer-supplier relationships and service development strategies should be pursued, depending on the logistics scenario at hand.

In accordance with the stated purpose, we have created an improved understanding of how the strategic choice of relevant VAS types depends on the customer's own logistics competence and service needs, and how the provider-customer relationship level determines the offered VAS complexity. There is, from the provider's side, a desire towards strategic long-term relationships. These allow gradually learning the customer's needs and developing trust, so the 3PL gets the chance to take over larger parts and more complex VASs in the customer's logistics-related functions. Selecting which VAS to pursue is thus, on the one hand, a strategic decision that facilitates evolution towards a more advanced 3PL role.

Operational decisions on offering a certain service or customization are, on the other hand, based on profitability analysis where most factors are included as potential cost and revenue, including development costs and expected volumes and contract times, as well as risks. However, non-quantifiable factors cannot be fully avoided and may sometimes lead to a decision that differs from the formal profitability conclusion. The strategic and operational aspects are reflected in Figure 29 and Figure 34 respectively, which, together with the overview in Figure 35, form a framework that captures main VAS offering principles by 3PLs.

We further posed research questions that have been answered by the findings of the thesis.

RQ1: Which are the main criteria for VAS or service customizations offering decisions?

Two levels of criteria have been identified. The choice of VAS types to offer depends on the service level that the existing 3PL role and customer relationship allows on the one hand, and on which VASs facilitate the provider's targeted, future 3PL role and relationship evolution on the other (Sec. 5.2). The detailed decision process then considers the value creation potential of the desired VAS for the customer, profitability as the most important criterion, but also non-quantifiable, soft factors like regulations, customer satisfaction and relationship development and provider image (Sec. 5.8).

RQ2: Which types of VAS or service customizations are relevant to offer for different combinations of 3PL provider and customer categories?

Several scenario-specific VAS offering patterns have been identified. Customers with limited in-house logistics capabilities and small logistics organizations are open to more integrated, complete logistics solutions and a large scope of VASs in order to keep the operations slim. In scenarios involving customers with large logistics operations, on the other hand, VASs related to volume processing or advanced services are commonly relevant (Sec. 5.5). Also, more complex VASs and customizations are feasible for more strategic relationships where higher provider-customer integration is feasible and investments can be written off over a number of years. The industry segment and SC role of the customer is generally not a decisive factor in which VAS types are relevant, but specific services offered of course depend on the operations of the particular customer (Sec. 5.7).

RQ3: How do provider-customer relationships and service innovation strategies depend on the VAS types offered by the 3PL providers?

The study has found that the current service complexity affects the extent of customer knowledge that the provider can build, and thereby the depth of the relationship and future VAS opportunities. VAS offering is thus also a tool for customer relationship development (Sec. 5.2). New services are usually developed in response to concrete customer requests; market-oriented innovation without specific customer interest is rare (Sec. 5.9).

In addition to the above results, several additional findings should be highlighted. The existing literature, e.g. Hertz and Alfredsson (2003), tends to refer to 3PL providers as *companies* belonging to different service provision categories, one example being the classification in Figure 5. While this is natural for developing the theoretical understanding, we found that, in practice, a company usually assumes different 3PL *roles* towards different customers with different needs. In terms of VAS offering, it is thus more relevant to talk about the 3PL role in a given logistics scenario. The drive to move towards higher service levels and higher integration and customization is thus relevant on a per-customer basis.

Although the industry segment of the customer is traditionally used for customer classification, it is not the decisive factor regarding 3PL service types. Rather, it is the customer's own logistics capability and service needs that primarily determines the relevant VAS levels which are common to many segments.

One prerequisite for offering a diverse set of VASs to multiple customers is a suitable service platform, especially when services are individually customized, An IT system is usually required that can help manage complexity and keep track of the individual processes.

Tracking and transparency at the item level, not just at the shipment level, is a key feature that makes a difference for customers.

The importance of VAS for 3PLs is to provide some "extra" features for the customer. It can be the decisive factor for keeping the contract, or for differentiating over the competition to attract a new customer. The VAS offering also differs from basic services in that some services may in some cases be implemented at a loss if the customer contract as a whole is profitable. We found that the customer usually takes the initiative for adding new services to the existing relationship. Pro-actively proposing additional services to a larger extent could help providers increase their VAS volumes and scope towards different customers.

All interviewed 3PLs reiterate that the VASs are where the main profit comes from. They allow moving towards the upper-right corner in the Hertz and Alfredsson (2003) classification figure (Figure 5), away from low margins and low profitability. One of the insights of the study is that the aim and the process is rather similar, whether viewed as moving between 3PL role quadrants, developing long-term relationships with the customer, or engaging in increasingly complex and complete services.

In the big picture, VAS improve the SC as a whole, with the end customer as the beneficiary. They enable the customer-driven "pull" function in the supply chain with short lead times. Although the individual SC actors and their 3PLs primarily focus on their respective sections of the SC, the VASs applied by each of them improve efficiency for the full chain. They lubricate the entire supply chain and get the product to the end customer faster, cheaper, and with higher quality.

6.2 Contributions

The study has taken a comprehensive look at issues related to how 3PL providers offer value-added services: how VASs are defined and how their role is viewed by different providers, which services are relevant in which logistics scenario, how decisions are taken whether or not to develop and/or provide a certain service, and how service innovation for VAS takes place.

A theoretical foundation based on the value chain theory (Porter, 1985) has been used which differs from the more traditional network view. The study has demonstrated how the classical value chain and generic strategy principles (Porter, 1980) need to be slightly modified, but the underlying concepts are well applicable to VAS offering decisions. This frame of reference has also allowed identifying some possible improvements for how 3PL providers should work with their VAS offerings.

A special focus has been on how the customer's logistics competence and the existing provider-customer relationship determine the VAS types that are feasible in the given scenario, and what the decision process looks like, depending on the logistics scenario. There exists ample literature about strategic development of the 3PLs and its dependence on the established provider-customer relationship, e.g. Hertz and Alfredsson (2003). However, based on our review of literature, the dependence of the VAS offering on the 3PL role and its importance as a driver for evolving that role appears not have been clearly discussed. Therefore, the thesis has provided a better understanding of the strategic and operational aspects around VAS offering decisions. Based on that understanding, our framework figures offer a novel illustration of how the feasible VAS depend on the customer type, on the

existing and desired customer relationship, and on the factors considered in the service offering decision process.

6.3 Limitations

Due to the time restrictions of the thesis, a limited number of companies were invoked in interviews. We believe that the study is still qualitatively generalizable, especially since no major deviations from previous theory were found. However, investigating a larger set of 3PLs may provide additional insights and allow better assessing the urgency of the different decision factors in the entire 3PL market.

The number of survey responses from 3PL companies was also limited, only allowing the use of the results for descriptive statistics. For better verification of the qualitative conclusions, the interview-based discussion could be supported by a quantitative analysis based on a larger number of responses where the customer type and offered VAS type relations could be determined using probabilistic statistical methods.

6.4 Future research

In this study, the classification of 3PL customers was based on their logistics competence level and the industry segment they operate in. An improved classification of customers could be made according to the problems they are facing, their requirements and needs. This would likely result in a more insightful grouping since, as we saw, relevant 3PL service types were common across multiple segments. Such a study would better capture the customer perspective, talking to both customers and providers directly about their needs and 3PL relations.

The overall SC efficiency is maximized if all actors work towards value creation for the end customer. Therefore, it is important for the 3PL to know the needs of the end customer. We found in the thesis that mot 3PLs obtain this information through their customers which may filter and bias this information. A relevant topic for future research could be to study how the indirect information flow may affect the resulting logistics efficiency, and understand obstacles to more direct communication between the 3PL and the end customer.

One of the observations in the study was that formal value system thinking at the supply chain level was not applied by 3PLs. We believe that this could further help 3PLs in strategically offering appropriate VASs with high profitability potential. Additional research into what the obstacles are to value chain thinking and how this could be incorporated in 3PL companies' decision making is recommended.

Finally, Selviaridis and Spring (2007) and Soinio (2010) have expressed concern that customers consider certain functions too strategically important to outsource and underestimate the competence of the 3PLs in these areas. Therefore, the progress towards outsourcing of whole logistics functions and creating more efficient supply chains may be unnecessarily slow. An important study topic is therefore how to better convince the customers to embrace these advanced VAS offerings. Knowledge about how the feasible VAS offering depends on the established provider-customer relationship and their interdependent growth, discussed in the thesis, may be a good starting point.

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Appendix 1: Interview guide to 3PL providers

Opening the interview

We briefly presented the topic of our thesis, informed the interviewee that the information will remain anonymous, and asked for permission to record the conversation.

The interviewee was offered an opportunity to introduce the company and his/her position.

Company overview

Please describe your company's logistics services and business strategy.

What is your company's core competence?

Customer and provider categories

How would you characterize your company as a 3PL provider?

Who are your customers, according to segments, logistics competence, supply chain role, etc.?

Relationships and service evolution

How do you choose the relationship type towards your customer?

How do you work with your customers to understand their service needs and to agree about relevant services?

VAS types and importance

Which value-added services (VAS) do you offer and to which customer types are those relevant?

How would you define VAS in the context of your company's service offering?

How are the VAS in your offering related to basic services?

Decision process

Please describe your decision flow for determining potential VAS types for a customer, and related relationship and service development issues.

Which factors do you consider in this decision process?

If you do not have the capability required for a requested service or customization, what are the main criteria in deciding whether to develop it?

How do you capture relevant decision criteria in your cost/benefit analysis?

How do you reason about minimum requirements for volumes or time duration that the customer must commit to using the service?

How can IT integration issues become a limitation in offering a service or customization? Examples?

What are your experiences with potential insourcing of services after customer's own competence improves as a result of the services you provide?

How do you view subcontracting some VAS that you are unable/unwilling to provide? Examples?

Service development and innovation

What motivates your service innovation?

How you come up with new VAS and improvement ideas?

How do you refine a VAS over time together with the customer?

How do you learn your customer's customer's needs?

Strategic use of VAS

How do you identify where in the value chain the customer perceives more added value, in order to target you VAS development and offering decisions?

What is your company's market strategy and how does that steer your service offering decisions? Examples?

What is the importance of VAS in total service contract negotiations with the customer?

Appendix 2: Survey questionnaire to 3PL providers

Welcome and thank you for taking the survey!
Your answers will help create new knowledge in the area of 3PL service offering.

- Arcelly Herrera and Lisui Yang

The survey consists of two main parts:

1. Your company as a 3PL provider
2. Your customers and service relations

It should take 5-10 minutes to fill.

The survey is anonymous. Neither your company nor your customers need to be identified.

You will be presented a number of multiple-choice questions. Please choose the best fitting answer to each question, even if it is not a perfect match for your situation. You can comment on a possible mismatch or complement your answer in the comment box on each page if you wish.

You can pause and resume the survey at any time. You can also go back to review or revise previous answers whenever you wish.

How many employees does your company have?

- ○ Less than 10
- ○ 10-49
- ○ 50-249
- ○ 250 or more

When was your company founded?

- ○ Before 1980
- ○ 1980-1999
- ○ 2000-2009
- ○ 2010 or later

How would you assess the range of available services that your company offers?

Narrow	Medium	Broad
○	○	○

How would you assess the degree of customization of your offered services?

Limited	Medium	High
○	○	○

Which description best describes your overall service offering strategy?

- ○ Basic transport and warehousing services
- ○ Customer-specific service packages compiled from standard service modules
- ○ Heavily customized or custom-developed solutions
- ○ Full logistics solutions design and provision

Which are the core competences of your company as the 3PL provider? (select one or two)

- ☐ Transportation
- ☐ Warehousing
- ☐ Logistics information systems
- ☐ Consultative or design/engineering services
- ☐ Other value-added services
- ☐ Full logistics offering

Which service types do you offer and what motivated their initial development?
Please mark the development motivation for relevant services.

	Development motivation			
	× Not offered	Common market expectation	Demand by multiple customers	Request by a specific customer
Transport planning and management	◉	○	○	○
Warehousing and inventory management (e.g. storage, order picking)	◉	○	○	○
Information technology services (e.g. tracking, order booking, analysis)	◉	○	○	○
Production- and product-related services (e.g. product assembly, postponement, labeling, packaging, just-in-time support)	◉	○	○	○
Customer-focused services (e.g. direct delivery, cross-docking)	◉	○	○	○
E-commerce services	◉	○	○	○
Promotional services (e.g. point-of-sale displays, promotional materials, telemarketing)	◉	○	○	○
After sales service and reverse logistics	◉	○	○	○
Administrative services (e.g. purchasing, order processing, invoicing, export/import operations, customs brokerage)	◉	○	○	○
Customer service	◉	○	○	○
Consulting	◉	○	○	○
Financial services	◉	○	○	○

In the next section, we inquire which services you provide to your customers or customer groups, how those services are developed, and which relationship types you have with the customers.

To answer the following questions, please choose **one particular** customer or a group of customers with common characteristics.

What is the role of that customer in the supply chain?

- ○ Manufacturer
- ○ Distributor
- ○ Retailer

What is the customer's field of business?

How would you assess the customer's in-house logistics competence level?

Low	Medium	High
○	○	○

How would you assess your company's relationship with the customer?

- ○ Tactical partners, short-term (time horizon of a few months)
- ○ Service partners, medium-term (1-2 years)
- ○ Strategic partners, long-term (several years)

Which services does your company provide **to this customer** and how where these services selected?
Please mark the offering reason and development type in rows for relevant services.

	Offering reason			Development type			
	× Not provided	Requested by the customer	Proposed by you as provider	× Not provided	Existing service	Customized service	Newly developed standard service
Transport planning and management	◉	○	○	◉	○	○	○
Warehousing and inventory management (e.g. storage, order picking)	◉	○	○	◉	○	○	○
Information technology services (e.g. tracking, order booking, analysis)	◉	○	○	◉	○	○	○
Production- and product-related services (e.g. product assembly, postponement, labeling, packaging, just-in-time support)	◉	○	○	◉	○	○	○
Customer-focused services (e.g. direct delivery, cross-docking)	◉	○	○	◉	○	○	○
E-commerce services	◉	○	○	◉	○	○	○
Promotional services (e.g. point-of-sale displays, promotional materials, telemarketing)	◉	○	○	◉	○	○	○
After sales service and reverse logistics	◉	○	○	◉	○	○	○
Administrative services (e.g. purchasing, order processing, invoicing, export/import operations, customs brokerage)	◉	○	○	◉	○	○	○
Customer service	◉	○	○	◉	○	○	○
Consulting	◉	○	○	◉	○	○	○
Financial services	◉	○	○	◉	○	○	○

You are almost done!

Please provide any additional comments about your company's service offering. (optional)

What is your position in the company? (optional)

Please provide any additional comments about your experience with the survey. (optional)

Appendix 3: Survey questionnaire to logistics users

The purpose of this short survey is to briefly characterize the logistics needs of your company and the outsourcing relationship with your logistics provider. It should take about 5 minutes to fill.

The survey is anonymous. Neither your company nor your logistics provider need to be identified.

You will be asked multiple-choice questions. Please choose the best fitting answer to each question, even if it is not a perfect match for your situation. In case you work with several different types of providers, please choose a certain logistics provider to focus on.

You can comment on a possible mismatch or complement your answer in the comment box.

What is the role of you company in the supply chain?

- ○ Manufacturer
- ○ Distributor/wholesaler
- ○ Retailer (including e-commerce)
- ○ Owns the entire supply chain

Which logistics functions are relevant to your company? For each relevant function, please mark whether you perform it in-house or outsource it to a logistics provider.

	Not relevant	Performed in-house	Outsourced
Transport planning and management	◉	○	○
Warehousing and inventory management (e.g. storage, order picking)	◉	○	○
Information technology services (e.g. order tracking, stock analysis)	◉	○	○
Production- and product-related services (e.g, product assembly, postponement, labelling, packaging, just-in-time support)	◉	○	○
Customer-focused services (e.g. direct delivery, cross-docking)	◉	○	○
Promotional services (e.g. point-of-sale displays, promotional materials, telemarketing)	◉	○	○
After-sales service and reverse logistics (e.g. repairs, returns)	◉	○	○
Customer service	◉	○	○
Logistics solutions consulting	◉	○	○
Logistics-related financial services	◉	○	○

How does your company work with the logistics functions listed above?

- ○ A few people interfacing with the logistics provider
- ○ Smaller groups performing some of the functions
- ○ A logistics organization supporting numerous functions

How would you assess the overall level of your company's in-house logistics skills?

- Low
- Medium
- High

What type of relationship do you have with your main logistics provider?

- Tactical partners, short-term (a few months)
- Service partners, medium-term (1-2 years)
- Strategic partners, long-term (several years)

Who mostly drives the evolution of outsourced logistics functions over time?

- You as the customer
- Your logistics provider

Please write any additional comments about your logistics functions handling, or about your experience with the survey. (optional)

What is your position in the company? (optional)

Appendix 4: Categorization of VAS

Inventory and logistics Management	Customer service	Warehouse Management	Transportation
Freight Consolidation Freight Distribution Shipment planning & Management Traffic Management Inventory Management Carrier Selection Order entry/Management Back-order capability & fulfillment Forecasting Cycle count and auditing	Freight Payments Auditing Order Management Fulfillment Help desk Carrier selection Rate Negotiation Warranty parts recovery Custom brokerage Selection of software Consulting services After sale services Operation of IT systems Reverse logistics	Packaging Product Making Labeling/re- labeling Warehousing Receiving Sort and direct put away Merge and pack-out Manifest documents Bar code printing Pick and pack Product testing Assembly & Installation	Fleet Management & operations Cross-docking Product return Merge in transit

Table 10: VAS in Different Areas of Logistics (Vaidyanathan, 2005).