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1 Introduction

The thesis you are now reading is the result of many hours dedicated to discussions regarding the question: “What is customer maturity”. The subject was picked in conjunction with an IT consultancy firm with a local office in Jönköping which were interested in a tool that was able to help them in assessing the quality and maturity of their customers. The company wanted the final deliverable to be some sort of tool that should be able to function in a “quick and dirty” environment, where a sales representative would have a short meeting with a potential customer and would benefit from a guide or assessment tool to help structure, measure and aggregate the critical aspects related to maturity. This was immediately recognized as an opportunity to research a previous unexplored subject, touching upon several different disciplines of research ranging from cultural aspects to the architecture of IS within the organization.

The final goal of the thesis was clear; find out what customer maturity means in the IT-consultancy context, figure out how to accurately to measure it and in the end distill this knowledge into a practically viable tool.

1.1 Background

The intended users of the Customer Maturity Analysis Tool (CMAT) this thesis seeks to design are professionals working within the IT consultancy and services industry which are in a position of evaluating a potential or current customer’s organizational maturity. The IS/IT industry is characterized by several unique risks associated with the implementation of large IS systems which motivates an evaluation of the organizational maturity to be included in the planning or implementation process.

Due to the extensive size and complexity of ERP and other major types of IS software the procedure of installing and starting up the software normally requires several months of preparation. The work associated with evaluating prospect systems, customizing the software and in the end going live has become a multimillion dollar industry. The high demands on the IS software in terms of stability and complexity makes many companies turn to IS/ERP vendors in order to purchase tested and validated software instead of developing it in-house. This decision has created an environment where companies invest large sums of money into implementing and using software that was not originally developed for their particular needs; the actual development work is done without direct contact with the final users (Johansson and Andersen, 2007).

Johansson and Andersen (2007) argue that because of the gap between the developed software and the actual needs of the implementing organization some form of modification is normally needed in order for the IS to actually fit into the organization. This gives the two fundamental options of either changing the software, the organization – or both. The current “standard operating procedure” adopted in the IS environment is to strive for minimal changes of the software and try and change the organization where it is possible instead. This method is adopted mainly because of the inherent risks and associated work in making changes in these types of large and complex software applications. Johansson and Andersen (2007) also argue, that due to the size and complexity of the implementation process the vendor or other third party organization are many times called in to facilitate or even lead the implementation process due to their large expe-

rience and knowledge regarding the standard IS implementation processes. However, hiring outside expertise can many times carry a very high cost, and many times the total cost of implementation ends up costing double the license fee for the software.

Rao (2000) and Al-Mashari (2000) claim that even though the implementing companies historically have been willing to adapt their own business processes to better fit the embedded processes in the IS software, and have been willing to pay for experts during the implementation process many implementations have not been able to show the promised benefits. In addition to this, Motsios (1999) argues that disagreements regarding the implementation approach as well as galloping costs can lead to conflicts between the implementing organization and the implementation consultants – further risking the success of the implementation attempt.

One of the main tasks in the implementation process is to match the implementing organizations needs with the functions available in the IS system. This assessment will be the base of the change in processes or software. An error in the needs analysis might cause costly and painful change that is unneeded or even counterproductive for the organization. The combination of high costs and risks for the customer organization in combination with a complex implementation procedure creates a market where firms possessing the ability to conduct successful implementations of IS, and especially ERP systems to become very successful (Johansson et al., 2007). This has made the market very competitive and firms have started to create “best practice magic methods” that will guide the whole implementation process – from business case creation to post implementation support. These methodologies can be very detailed and some contain explicit deliverables for each activity as well as descriptions of all activities in detail, but are very dependent on information gathering prior and during the implementation process. The company representative therefore asked for an investigation how additional knowledge regarding maturity aspects of the customer organizations could benefit this knowledge intensive process.

1.2 Problem Formulation

The ability to accurately capture the organizational needs and status of the implementing organization is part of the core competency of IT consultancy firms – and therefore a sought after area to establish a competitive advantage. The business processes are in many cases subject to change upon acquiring and rolling out an ERP solution or other similar IS project. Therefore the management of business process reengineering is often considered a critical success factor for implementation of large IS, and consequently a candidate to indicate maturity within the customer organization. However, when consulting literature and case reports connected to IS implementation many of the main reasons for failed IS/ERP implementations are not at all related to Business Process Management (BPM) or the actual product, some of these factors can be:

- Resistance to Change
- Lack of Buy-in from the implementing organization
- Inadequate Training & Education
- Poor Project Management

These types of reasons for implementation failure are more dependent on the actual skills, level of motivation and leadership ability in the implementing customer organiza-

tion than on the quality of the implementation solution. This view is shared by the representatives at the case company, who states that the implementation procedure many times have to be modified or simplified due to unforeseen low levels of maturity within pockets or areas of the implementing organization. Other important factors for the outcome of the implementation process can be:

- The IS/IT infrastructural level of the firm.
- Maturity and advancement of the pre IS/ERP processes and the way they are governed.
- Maturity and advancement of the employees in different positions within the firm.
- IT usage and knowledge within the customer organization.

This suggests that there are several potential information sources in the customer organization that are not necessary directly related to the product/service or its technical requirements that can be used to better understand the organization, and therefore be of value for consultants.

There are however at this point no prior models for assessing customer maturity which indicates a gap in both academia as well as the already established gap within the industry for this type of assessment tool. This thesis therefore aims to provide a framework capturing important aspects of maturity as well as formulate maturity measurements for these which combined forms a tool capable of capturing and analyzing customer maturity within the IS implementation context.

1.3 Presentation of purpose statement and research question

To investigate how a Customer Maturity Analysis Tool (CMAT) can be used to capture valuable information regarding customer organizations. The study aims to identify which concepts that need to be modeled and how these ought to be measured. The goal is to develop a tool that will be able identify and measure the most important concepts related to customer maturity while being considered practical enough to ensure a high level of acceptance among the potential users.

In order to fulfill the purpose of the thesis, the following research question was formed:

- Which aspects need to be covered by a CMAT in order to evaluate the pre implementation maturity for potential customers of our case company and how should these aspects be organized and measured?

1.4 Delimitations

As the primarily purpose of the thesis was to conceive a CMAT tailored to the demands of the case company no result past the literature review neither claims or have been tested for any kind of generalizability outside the particular branch of the case company that constituted the source of empirical data.

1.5 Interested parties

- IT-Consultants working with IS implementations or other related activities which are interested in obtaining a framework and maturity levels to develop their own CMAT or similar tool.
- Researchers within the customer maturity or IS implementation knowledge modeling discipline interested in a maturity framework as well as a taxonomy of concepts related to customer maturity.

1.6 Definition of key concepts

Customer Maturity

The concept of maturity is in this thesis assigned to the deliberate development of a wide array of aspects related to both effectiveness and efficiency within an organization. Maturity is also considered to be related to system awareness as well as optimization of resources and alignment of activities according to super ordinate goals. Customer Maturity is defined as the total observable maturity within an internal or external organizational unit that functions as a customer for the evaluating individual/organization.

Customer Maturity Analysis Tool (CMAT)

A Customer Maturity Analysis Tool is a instrument designed to capture and assess maturity from an external perspective for an entity designated as a customer. The CMAT proposed in this thesis contains four separate perspectives used for the evaluation of customer maturity; IT, Process, Culture and Business Governance.

IT Maturity

Organizational IT Maturity is regarded as a subset of the maturity concept for the context of this thesis. The IT maturity of an organization is primarily based on the development of capabilities and integration of services within the organization as well as the maturity of the capability and management practices of the current IT infrastructure.

Process Maturity

Process Maturity is a perspective within the CMAT that targets the deliberate development, management and capability alignment of processes within the customer organization. This perspective of maturity also incorporates the conscious management of enterprise level process enablers that allows high maturity processes to be conceived and thrive.

Cultural Maturity

Cultural Maturity is used in the CMAT as a perspective that targets organizational aspects which originates from attitudes or mindsets that potentially can affect the interactions with the evaluating organization.

Business Governance maturity

This perspective within the CMAT contains measurements and evaluations of the deliberate, formal and explicit aspects related to the governance of the customer organization. The perspective targets aspects such as the maturity of knowledge management and strategic planning from a strict managerial perspective.

2 Methodology

This chapter seeks to describe the scientific and research related decisions and methods that guide the thesis work. The chapter begins with describing the choice of research strategy that guided the scientific work of the thesis, followed by a description of the research design and ends with a explanation of the choice of method for data collection and analysis.

During academic work it is imperative to have a structured or at least a documented schematic of both the upcoming as well as the already conducted work. By keeping the research structured and documented other individuals can access, review and utilize the information that each piece of the research activity aims to create. The contemporary scientific method can be described as a repeatable cycle with at least five steps (Yin, 2003):

- Formulating explicit research questions
- Developing a formal research design
- Using theory and reviews of previous research to develop hypotheses and rival hypotheses
- Collecting empirical data to test the constructs
- Conducting analyses of the data

Before the formalization of the research associated with solving the research questions a number of assessments and decisions regarding the research needs to be made, these are in this thesis collected in the “Research strategy” subchapter.

2.1 Research strategy

The research strategy is composed of overlaying considerations and decisions regarding the questions:

- What is the relation between theory and research?
- What is acceptable knowledge?
- How is data looked upon in this thesis?

2.1.1 Relation between theory and research

There are two fundamental perspectives relevant for this thesis on how to look upon the relationship between theory and research; the school of deduction and the school of induction.

Deduction

The deductive approach is mainly focused on creating new knowledge by deducting one or several hypotheses from an already existing body of knowledge and empirically testing it. The research work begins with an examination of available theoretical material regarding the research topic, from this information a hypothesis is constructed and expressed in operational terms to enable measurement. The next step is to collect valid empirical data with an appropriate method to be used in the test of the hypothesis. The

test or analysis of the data in relation to the theory will confirm or reject the hypothesis which in turn will be revised or accepted (Bryman and Bell, 2003).

Induction

In a research approach based on induction the relationship between theory and research is that the theory is a result of the research activity. The empirical data gathered during the operational work is translated into information and interpreted, resulting in the forming of theory if the results are conclusive enough. To be considered “true” by inductive standards the conclusion must be based on a large number of valid observations where the observations are not heterogeneous and none of the observations contradicts the others (Bryman and Bell, 2003).

2.1.2 Qualitative or quantitative stance on data

This part of the research strategy aims to clarify the overlaying strategy for collection of data to be used in this thesis. The two main stances are either a qualitative view, or a quantitative view.

Qualitative research

Qualitative research utilizes methods of data gathering and analysis that do not rely on statistical methods and primarily measures data that cannot easily be quantified. The focus lays on understanding or interpreting the data to reach understandings.

Quantitative research

Quantitative methods are designed for conducting research focused on measuring and finding correlations and conclusions within the quantified data.

The quantitative and qualitative methods are summarized in Table 2.1 below:

The difference in emphasis in qualitative versus quantitative methods	
Qualitative Methods	Quantitative Methods
Emphasis on understanding	Emphasis on testing and verification
Focus on understanding from respondent's / informants point of view	Focus on facts and /or reasons for social events.
Interpretation and rational approach	Logical and critical approach
Observations and measurements in natural settings	Controlled measurement
Subjective 'insider view' and closeness to data	Objective 'outsider view' distant from data
Explorative orientation	Hypothetical-deductive; focus on hypothesis testing
Process oriented	Result oriented
Holistic perspective	Particularistic and analytical
Generalization by comparison of properties and context of individual organism	Generalization by population membership

Table 2.1 Describes quantitative and qualitative methods, from Ghauri & Grønhaug (2005, p.110)

2.1.3 Choice of Research Strategy

The most optimal strategy of this thesis was interpreted to be one that aims to integrate and modify “best practices” of separate research disciplines and adapt them to the customer maturity context. The creation of completely new theory regarding customer maturity was considered outside the scope and restrictions of the thesis. This motivates a deductive approach. However, the analytical work will utilize inductive thinking as the theoretical construct of the CMAT will be tested in a reality that might or might not correspond to the theoretical models, which may have to be modified to receive acceptance in the case company. Nevertheless, the research approach used in this thesis is mainly based on a deductive perspective in how to handle theory.

In order to evaluate the needs from the potential users of the CMAT, as well as identifying and operationalizing the different aspects of the model, rich and contextual information was deemed necessary. This favors the qualitative approach in gathering and analyzing data for the analysis.

2.2 Research design

A strategy influences and guides the organization, but it will not achieve the projected benefits if it is not executed properly; in this thesis the research design represents the tactical choices made in the formulation of the research strategy. It provides a framework that guides the research by structuring the data collection method(s). Some of the research designs described by Bryman and Bell (2003) are; Experimental, Cross-sectional, Longitudinal, Case study and the Comparative designs. The research design should be effective in providing data and information for solving the research question while operating within the “worldly” constraints of the researcher(s) (Ghauri and Grønhaug, 2005).

Upon reviewing the available types of research designs from a number of theoretical methodology collections the case study type was found to be most appropriate for collecting data relevant to our research question.

2.2.1 Case studies

A case study enables the researcher to conduct an in-depth investigation of the phenomenon that is the topic of research by focusing on one single organization or case. The focus of the study is according to Bryman & Bell (2003) to enable an intensive study of the phenomenon within its own environment. Including the context of the phenomenon into the study enables multiple variables to be identified which allows for a richer data pool and analysis, but significantly raises the complexity of the study. This often requires the study to utilize multiple data gathering techniques in order to cover enough of the applicable variables (Yin, 2003).

According to both Bryman & Bell (2007) as well as Yin (2003), case studies are well equipped for both quantitative as well as qualitative methods, and a combination of both. A case study can also contain elements of a longitudinal study, this occurs when a researcher returns to the case environment(s) on several occasions and during a prolonged time (Bryman and Bell, 2007).

Yin (2003) describes six main types of case studies in a 2x3 matrix. The first factor targets however the study features on a single or multiple cases where a singular case offers more in depth data gathering and multiple cases offers a wider spectra of environments to observe the phenomenon. The other axel in the matrix describes the main goal of the research; exploratory, descriptive or explanatory (causal).

Exploratory case study

In an exploratory case study the researcher sets out to collect data and impressions before the actual research purpose is defined. By observing a phenomenon within its context the researcher may discover new theory. An exploratory case study is often seen a prelude to another study, the phenomenon or data observed in the exploratory case study may reveal a need to enhance the study to a more formal or reform it to something completely different from a case study (Yin ,2003).

Explanatory (descriptive) case study

Compared to an exploratory case study the research problem featured in an explanatory case study can be considered structured and well understood. The first main task of the researcher is to produce a well designed research strategy and design to solve the semi-structured problem. Operationalization of the relevant data and its measurement is another important part of the researches work. Key characteristics of explanatory research are: structure, precise rules and procedures (Ghauri and Grønhaug ,2005, Yin, 2003).

Causal case study

Causal research is characterized by well structured problems and ‘cause and effect’ issues within the problem formulation. The main task for the researcher is to investigate the relationship between cause and effects within a population of concepts and variables (Ghauri and Grønhaug, 2005).

2.2.2 Choice of research design

By using a single case study method to organize the research several advantages will be available compared to using other design methodologies. A singular case study will enable a sense of familiarity to grow with the case organization and enable a more in depth investigation of the context surrounding the company, their needs and the characteristics of their customers. The research method will be characterized by an explanatory case study method as the supplied problem is structured and has already defined applications and context. This choice of research design will however limit the generality of the research but was deemed the most appropriate design in order to fulfill the purpose of the research.

2.3 Research method

If the research strategy and design correspond to the strategic and tactical choices in the thesis, the research method chapter relates to the operational activities associated with the research process and data collection in the thesis. This subchapter covers four main parts; the method of selection for the case company, the data collection method and the methodology guiding the literature survey. The fourth part explains the analysis work.

2.3.1 Setting-up the case study

The company selected for the case study was a pure selection of convenience. The company is an IT consultancy firm located close to the school and had expressed wishes to have a CMAT designed in collaboration with the school. This enabled the data collection to be performed in a corporate environment with a high degree of motivation and cooperation in order to finalize the research which enabled longitudinal data collection with a high level of detail. The downside is that the empirical data will be completely based on the attitudes and knowledge of a single company, the benefits of a single company case study was however deemed more important in order to complete the purpose in a reliable way. No other organization was contacted to serve as a source of empirical data.

2.3.2 Literature survey methodology

There are many reasons to conduct a thorough literature review prior and during research work. Some arguments that has been presented regarding heavy literature review to be included in the research process are “*all qualified research build on prior knowledge*” (Ghuri and Grønhaug, 2005, p.52) and “*research must be fully integrated with existing literature at all stages*” (Sharp and Howard 2002, p.22). It was early recognized that the main purposes of the literature review were to change during the evolution of the thesis. The literature survey work was divided into three main phases, early, mid and late thesis work.

During the early period of research work, focus lay on establishing a broad understanding of maturity in the context of organizations and IT. The initial study was conducted in line with the recommendations from Ghauri & Grønhaug (2005) where they advice the usage of already published research for framing the problem, identifying relevant concepts and positioning the study.

After the initial positioning and framing of the thesis the literature review held the function of distinguishing what has been done from what needs to be done and discovering important variables relevant to customer maturity within the thesis context. This was done in accordance with the reasoning from Hart (1998) on how to build on previous knowledge when starting a literature survey. This part of the literature review forms the main bulk of knowledge incorporated in the CMAT model. The literature used were identified by building on a few keywords related to maturity and by a “snowball” reference search for other cited articles within interesting aspects of organizational and customer maturity. Chunks of knowledge or models that were supporting or building on each other were grouped and represented in the model as concepts. One of the main points of this phase in the literature review was to identify and map theories regarding the different aspects of customer maturity where the theories supplied the thesis with a language and definitions to discuss maturity from several dimensions. This is mentioned in Sharp and Howard (2002) as one of the most important parts of the literature review work and allows the researchers to incorporate already existing models and knowledge into the CMAT without having to “reinvent the wheel”.

The third main purpose of the literature review in this thesis was to build on previous knowledge regarding how to operationalize and measure the validated concepts in the CMAT tool. This was mainly done by reviewing previous measurements published re-

garding the concepts included in the CMAT or by operationalizing concepts fetched from theory in cooperation with the case company during the analysis. The feedback provided by early researchers greatly helped in quantifying or defining different maturity levels and indicators from concepts that are measurable. By consulting previous research regarding the operationalization of concepts in the CMAT, the research-ability of the thesis were strengthened (Hart, 1998).

2.3.3 Data collection methods

Data collection can be a tedious and time consuming part of the research process, Sharp and Howard (2002) claim it to be the one of the decisive activities in the research process and needs to be planned and managed accordingly. Sharp and Howard (2002) argue that empirical data must first be located before collection and then arranged before analyse can commence. Sharp and Howard (2002) also propose a data checklist to be consulted before and during the data collection activities in order to ensure a high quality of data:

- The data actually measure what they purport to measure
- The proper attention was paid to measurement error and the reduction of its effects
- A suitable sample was used, in particular;
- That the conditions under which the data were gathered were properly noted
- That suitable data recording methods were used and efforts were made to detect and eliminate errors arriving during recording

Data used in analysis, especially in evaluating by qualitative methods needs to be gathered in both a feasible context as well as in a way that does not unnecessary disrupt the data. In many cases the data must be captured in such a way that it requires conversion before it can be used in any form of academic research. In many cases it is also difficult to directly measure the sought variable or phenomenon in empirical data's context. In these cases a surrogate variable needs to be developed, validated and deployed in order to conduct a measurement Sharp and Howard (2002). In order to capture the data needed for analyzing the content and operationalization of the CMAT as well as enabling direct feedback regarding the surrogate measurements the main bulk of data collection were decided to be done by interviews.

Interviews

Interviews are respondent researcher interaction dependent data collection techniques. Interviews can be done via mail, telephone or in person. For more valuable interviews the researcher will benefit from having basic information regarding the respondent as well as the interview topic to ensure the interview covers the right aspects. One of the main benefits of using interviews as a data collection method is the possibility of capturing data regarding a subject in a relevant population directly (Sharp and Howard, 2002).

Interviews can be organized in different levels of structure where the pure structured interview can be seen as a type of survey research. In structured interviews the researcher asks a standard set of questions to each subject included in the chosen sample. With a standardized interview format the researcher can compare respondents fairly and use

systematic sampling. When conducting all types of interviews an interview schedule and post interview documentation is important to secure the reliability of the collected data (Sharp and Howard, 2002).

The second type of interview is the unstructured interview which is depending on the interviewee's response to drive the interview. Unstructured interviews does not have any guide or detailed list of questions to ask to the candidate but only key questions prepared before the interview. The type of data than can be collected in more unstructured interviews is rich and flexible compared to surveys or heavily structured interviews. However the context and meaning of this type of data must be properly decoded and understood in order to bring value for research (Sharp and Howard, 2002).

Semi-structured interviews are a type of interview located between unstructured and structured interviews. In a semi-structured interview the researcher have a set of questions and a predefined topic is flexible enough to enable the interviewer to ask different questions and add more questions during the interview. Semi structured interviews can be viewed as a guide to capture a complex phenomenon or reality in a structured way without being too obstructing. This type of interview is especially valuable for exploring and discovering relationships (Ghauri and Grønhaug, 2005).

Semi-structured and unstructured interviews differ from structured interviews in that they demand greater skills from the interviewer, as in semi-structured and unstructured interviews we often obtain information about personal, additional and value-laden material.

2.3.4 Choice of data collection method

During the initial contact with the case study company several meetings were scheduled in order for the case company to validate the ongoing work on the CMAT as well as to be used as continuous data gathering for the background research. Additional meetings were scheduled at key progress points in order to evaluate and gather feedback on the ongoing work. These meetings evolved into semi-structured interviews which in the beginning primarily focused on establishing perspectives and assigning concepts for each perspective. One the perspectives and concepts became more stable the focus switched to establishing and evaluating measurements and maturity levels for the concepts included in the CMAT.

The interviews were booked through the main responsible representative or by approaching the respondents directly in their workplace. All interviews but #5 were conducted with the main company representative for the thesis which in the company were the team manager responsible for implementation activities. The expert chosen to be interviewed in interview #5 was the customer interaction and sales manager of the case company division. These two representatives were part of the case company management and were the responsible for the CMAT initiative as well as potential users of the tool and which were considered to know enough about the requirements of the CMAT to serve as the sole source of empirical data. No formal interview questions was used as the perspectives, concept model and tool were the main topic of each interview which were presented and discussed in great detail during each meeting. The interviews can therefore be considered to be semi-structured as the topic for each meeting was set (the

different deliverables for the CMAT) but not prepared in detail beforehand to constitute a structured interview format.

Before each interview an agenda was sent to the respondent together with the current progress of the thesis in order to orientate the respondent of the current work progress. Notes were taken during the meeting and a summary was conducted and agreed on before concluding the interview. These notes were also translated into feedback regarding proposed changes to the model or tool and again sent to the respondent to ensure the feedback was correctly understood, these notes are available for review in Appendix 1. Due to the active participation of the interviewee in the feedback for the CMAT no recordings of the interviews were considered to be needed.

2.4 Analysis model

The purpose of this research is to create a tool capable of measuring customer maturity in organizations potentially willing to purchase an IS/IT solution. The literature review as well as the interviews conducted in the case company resulted in keywords, maturity levels and measurements that needed to be validated and frequently adopted in order to fit into the CMAT context. This was done through a “translation” process where theoretical and academic input was used to form and validate the concepts and measurements included in the tool. The analysis model is displayed as Figure 2.4.1

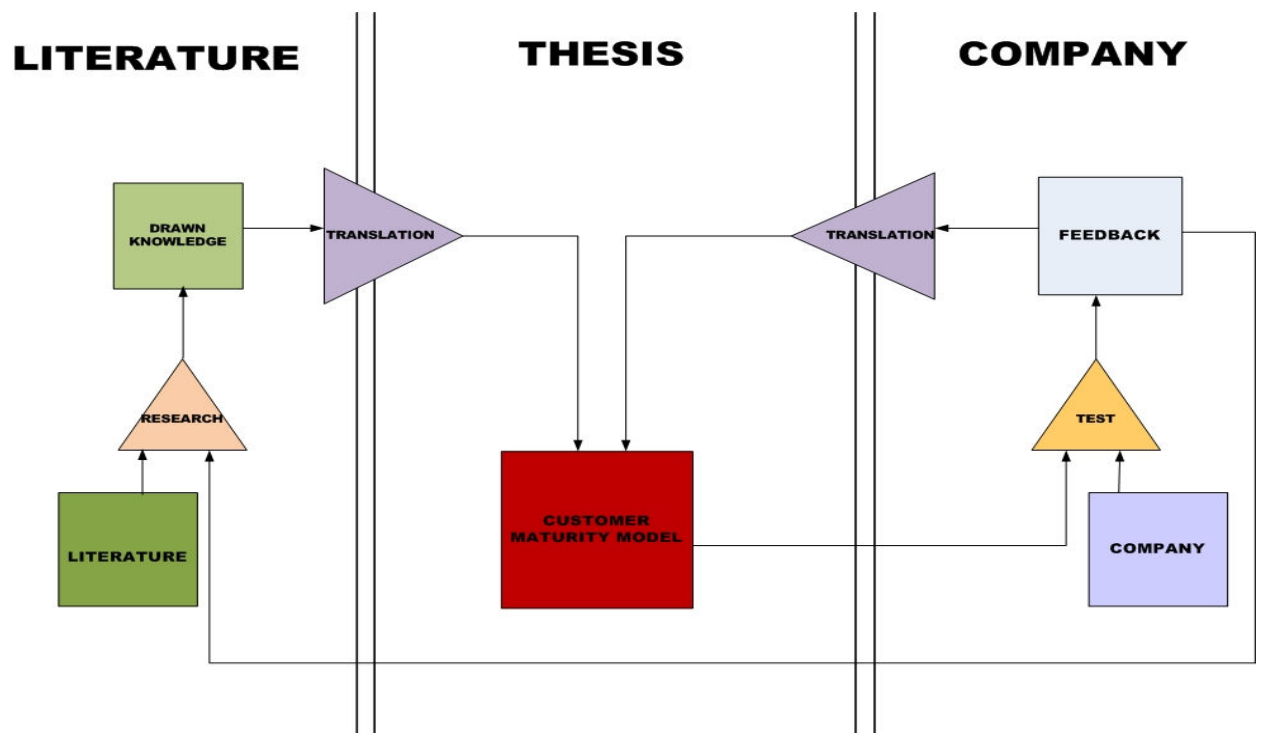


Figure 2.4.1: The analysis model used for the iteration of both academic and empirical input for the CMAT

2.4.1 Literature perspective

Theoretical methods, models and techniques are constantly being developed and revised, adding to the combined public knowledge regarding the research topic. Within the context of the thesis, this process is especially evident in the research activity regarding ERP systems. ERP has shown an impressive development in the last few years, visible through a constant increase of the number of articles, special issues of journals or dedicated sessions in international conferences (Botta-Genoulaz, Millet and Grabot, 2005). This constant development of information and knowledge is a source of both general and specific information which can be used for both the background as well as the specific parts of the CMAT.

Literature square: Contains published models and theories identified to be able to be related to customer maturity. In the analysis process, the material is filtered according to research questions and the context of CMAT.

Research triangle: After identifying potential aspects to be included in the CMAT either from the literature review or from the case company, an analysis and synthesis of the information is conducted to create a general understanding of the topic and potential measurements.

Drawn knowledge square: The knowledge regarding a potential concept based on the literature review is stored and later forwarded to the translation triangle between the theory and thesis perspectives.

Translation triangle: To become useful for the customer maturity model, drawn knowledge sometimes requires transformation to the specific context of the CMAT. Translation is the process of adapting and filtering concepts and measurements to the customer maturity model.

2.4.2 Thesis perspective

Second section of the analysis model is the thesis perspective. This perspective contains information and activities that are directly related to the creation of the deliverable of the thesis.

Customer maturity analysis tool: The repository of aspects, measurements and relationships between aspects that has been identified during the research process.

2.4.3 Company perspective

This thesis includes company support and this section is where the company support occurs for customer maturity model. Company section can be also seen as the practical side of the thesis where the model is evaluating by the experts.

Company square: The Company concept represents the Company Experts, their knowledge and “real work practices”. Experts are the decision makers and examiners of the model according to the cases they faced while working in the industry.

Test triangle: Experts in the company know, which specific areas this model needs to cover and which questions are waiting to be solved. With Test Triangle, company tests and evaluates customer maturity model.

Feedback square: After Customer maturity model being evaluated during the test process then it gives feedback related to non-completed sides of the model. Feedbacks is very important for the efficiency and the reliability of the model. This feedback can be simple and go directly to the translation triangle (process) for customer maturity model or can go to literature review to be more motivated.

Translation triangle: This process translates simple feedback from company to customer maturity model and gives the ability to improve the underlying model as well as the CMAT.

2.5 Evaluation of the choice of method

2.5.1 Method evaluation techniques

There are several different types of criteria for evaluating the quality of conducted research. Bryman and Bell (2007) claims that historically, reliability, replication and validity have been very common measurements of the quality of the scientific work. However, Yin (2003) argues that in the case of a case study the quality metrics for measuring scientific quality are different. He proposes four logic tests of the scientific quality for a case study; Construct validity, Internal validity, External validity and Reliability.

Reliability

The reliability measurement targets the security of the research method. A high measured reliability of the methodology enables a high probability of that the same results would be found if the research would be replicated. In order to create a high level of reliability for a case study documentation of data as well as the actual data collection (interview protocols etc) needs to be gathered and presented (Bryman and Bell, 2003).

Internal validity

The internal validity metric measures the reliability of the causality in the connection between dependent and independent variables in the research. The internal validity is dependent on proven connections between dependent and independent variables used in the research, in a case study this can be achieved by matching patterns together. A pattern could be a theoretical model or empirical collection of data that are compared and matched with the primarily data of the own research. Another method to achieve a high internal validity is to create a logical chain that anchors each deductive step of the research process (Yin, 2003).

External validity

The third quality measurement is the external validity of the case study research. The external validity measures the ability to generalize the findings of the conducted case study. This is traditionally a problem for both single and multiple case studies due to the low amount of cases in many cases constitute a weak foundation to create generalizations. (Yin, 2003)

2.5.2 Reliability and validity discussion

Reliability

The aim of the literature review was to establish a model that was broad enough to identify important concepts of customer maturity while having enough depth to assist in creating valid measurements of the reviewed concepts. In order to increase the reliability extra methodological material regarding literature review were consulted prior and during the review phase.

The interviews were mainly based on evaluating the parts of the CMAT, which initially was completely based on the literature review. Therefore the opening interview manu-

scripts would most likely be similar if this research would be replicated. The consecutive interview manuscripts were based on the modified CMAT as per input from the empirical data collected from the case organization. The reliability was during the whole research process maintained by thorough documentation of actions and procedures for all parts of the scientific process. The literature review as well as the interviews are reviewed by experts before being utilized in any analytical work to ensure the feedback was captured correctly.

Validity

Construct and Internal validity is in this research mainly based on the quality of the literature survey as well as how the feedback from the case organization is handled with regards to its incorporation in the underlying CMAT models. By using a self reinforcing, iterative analytical process for analyzing the concepts and measurements included in the CMAT based on both general (theory) and specific (empirical data) information the validity of the research will be reasonable high within this context.

The initial model constructed from the literature review will hold a reasonably high degree of external validity if the literature review satisfied the quality requirements, but will not contain any empirical validation from this research at this point. As analytical work progresses, the generality of the CMAT will decrease as the internal aspect of the empirical data will shift the CMAT towards a more specific form, tailored to suit the case company's needs. The external validity is structurally limited in this research due to the single company case design, which limits the empirical data collection to employees from a single organization. The final CMAT has therefore not been validated for generalizability outside the case company.

3 Theoretical Framework

The theoretical framework is the result of a literature review covering aspects that can be related to maturity in potential and confirmed customers of a IT-consultancy firm. The chapter is divided into four perspectives of maturity; IT Architecture, Process, Culture and Business governance. In every chapter a description of each of the concepts that will be evaluated for the CMAT is provided.

The notion of modeling, whether it is modeling of processes, information flows or product schematics is for many organizations a natural part of gathering and presenting information. Obtaining an information advantage is crucial in competitive environments where uninformed decisions can affect the market share of the organization. In order to formalize and structure the information modeling many organizations have made the choice to develop maturity and capability models to assess and benchmark aspects of the organization that is identified as important. Numerous companies and educational organizations have published their own capability maturity models to support assessments, change and implementation activities within organizations (Luftman, 2003). These models covers a wide spectrum of areas such as: software development, integrated process and product development and many more. Some of the most cited capability maturity models are:

- e-Sourcing Capability Model (eSCM) (IT Services qualification center at Carnegie Mellon University)
- Capability Maturity Model Integration (CMMI) (Software Engineering Institute at Carnegie Mellon University)
- IT Architecture Capability Maturity Model(ITacmm)(US Document Of commerce)

In order to structure the information encountered during the literature review the concepts related to customer maturity were divided into four separate maturity perspectives; IT Architecture, Process, Culture and Business Governance The perspectives were formed from what was considered to be the four most significant denominators of the reviewed literature as well as with consideration to the initial input regarding main areas of customer maturity that the case company had mentioned during interviews. Each perspective is in turn divided into sub-chapters containing aspects that were identified to be related to customer maturity within the IT consultancy context. After every sub-chapter of the literature review keywords of the literature will be presented to clarify which aspects that are utilized in the CMAT. In the end of every aspect a taxonomy of the hierarchy and relationships between the concepts is presented.

3.1 IT Maturity

Many enterprise business operations are performed with the help of or by IS/IT infrastructure. Companies who are planning to reengineer their business processes and who are expecting dynamic changes, often realize the importance of their IT infrastructure capabilities (Broadbent, Weill, and Neo,1999). Companies who find themselves in a competitive environment where companies within the same niche are trying achieve competitive advantages against each other IT infrastructure is increasingly seen as a fundamental differentiator (McKenny 1995).

Functions supplied by IT has changed and evolved from a purely data processing tool in the mid 1900's, to the strategic enabler of today (McFarlan & McKenney, 1983. McFarlan, 1982).With high IT maturity levels; goals for the company, functional processing capabilities, data format, database relationships and presentation formats of output can be gathered and analyzed more easily. With this type of detailed and accurate infrastructure information, implementation of IS systems can be passed through the customer organization easily, reducing gaps or misfits both from the customer perspective and as well as from the vendor perspective.

The available infrastructural capabilities within a firm affects the level of decision making and transactions that can be performed, where some authors even claim that: *“In today's companies , transactions have to be made in real-time, while communicating with customers and suppliers.”*(Steghuis et al. 2005, p.1) Both parties need updated data and a well integrated system to accomplish these transactions in the quickest and most beneficial way. Fully integrated companywide systems can support businesses all the time and in every situation. Companies, who realize necessity of the updated system, but who do not have real time transactional capabilities, will try to change (Steghuis et al. 2005) As a result of this most of the companies know that to handle a successful change it's an obligation to improve their IT-related development processes. This problem is partially solved by capability assessments; *“Capability maturity models address this problem by providing an effective and proven method for an organization to gradually gain control over and improve its IT-related development processes”* (US Department of Commerce (US DoC), 2003 p.1).On this direction US Department of Commerce (2003) aimed to first identify the weak areas of the architectural processes and depending on the maturity levels of the model, show where can these areas suit with future improvements.

On the other hand, IT infrastructure services/functions and the ranges of those services are included in the overall concept of IT infrastructure, and the infrastructure capability grows in a complementary manner with IT infrastructure services and their ranges. Before starting the complex ERP implementation lifecycle choosing the right way to implement or even before that choosing the most suitable ERP software is vital. Capability of the Information technology infrastructure is getting more vital in the concept of competitiveness for organizations. Firms, who can change rapidly according to opportunities, generally become more effective and more successful.

3.1.1 Strategic Context and Patterns of IT Infrastructure Capability

According to Broadbent et al., (1999) the most extensive IT infrastructure capability was found in firms where:

- Products change quickly
- Attempts were made to identify and capture synergies across business units
- There was a greater integration of information and IT needs as a part of planning processes
- There was a greater emphasis on tracking the implementation of long term strategy.

Broadbent et al. (1999) further argue that there are two different layers of IT infrastructure; the bottom layer is information technology levels which can be seen as computers and communication technologies. The next layer consist of shared information services which work on human information technology services, this is displayed in Figure 3.1.

Governance of large scale data processing or governance of firm-wide data base system can be seen as examples for these shared information services.

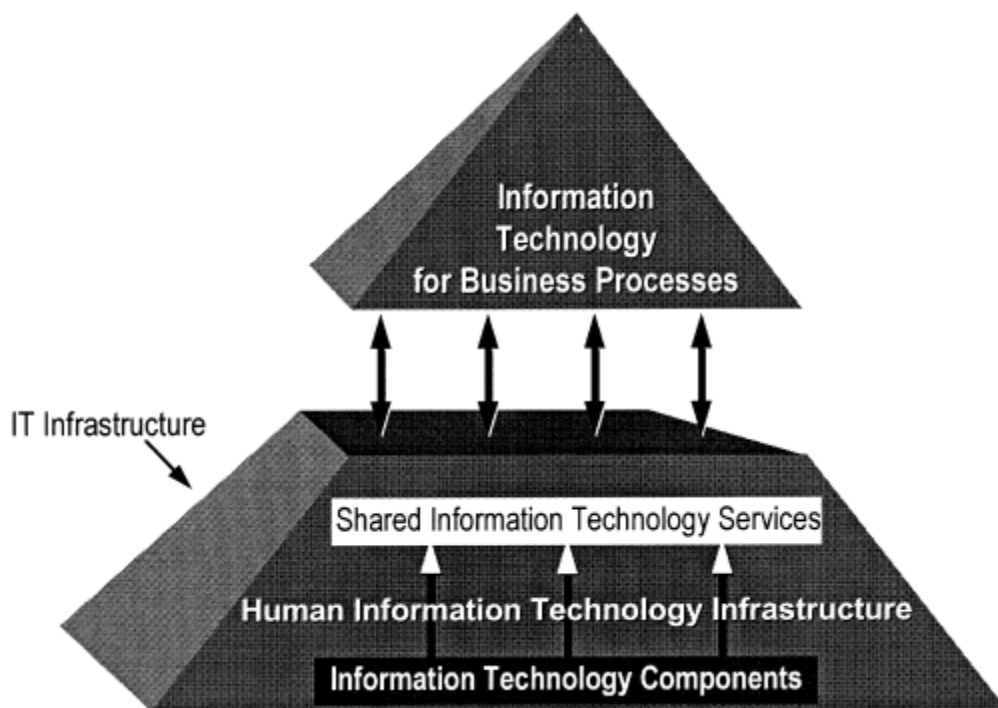


Figure 3.1.1: Displaying the elements of organizational IT infrastructure as portrayed in Broadbent et al. (1994).

These points can be grouped into two separate clusters. IT infrastructure services and their reach and range. More extensive integration of these concepts gives higher IT infrastructure capability maturity level.

Functions

IT infrastructure services which are being used across firm wide are mentioned as functions. These functions are focused and used to analyze the capability of the IT infrastructure. The functions required to be hosted by the infrastructure can be described as: “Cross functional process changes require a shift in the role of the IT function from being guardians of information systems to providing infrastructure support, particularly in the form of data management expertise and connectivity across areas and computer plat-

forms” (Dixon et al., 1994, Earl & Kuan 1994 p2 in Broadbent et al., 1999). This branch of IT Architecture Maturity Model, compares the common functions that company uses with the desired companies. According to research done by Broadbent et al. (1999), company functions have similarities depending on different factors like type of the industry, necessity of product change, flexibility issues and others. But companies have some common services that affect their power, dominance, future expectations and other specifications through their maturity. Broadbent et al. (1999) mentioned that there are five main services that all the researched companies have in common. These Functions are:

- Manage firm-wide communication network services.
- Manage group-wide on firm-wide messaging services.
- Recommend standards for at least one component of IT architecture.
- Security, disaster planning and business recovery services for firm-wide installations and applications.
- Technology advice and support services.

Reach and range

The level of IT Infrastructure capabilities depends on how much IT infrastructure functions can be reusable and sharable across the enterprise. The business connectivity of IT infrastructure can be defined in terms of reach and range (Keen, 1991. Keen & Cummins, 1994). Reach refers to locations that can be connected via the infrastructure, while range determines the level of functionality that can be shared automatically and seamlessly across each level of reach Broadbent et al. (1999). Improvements on reach and range will allow to have new relations between new and old locations and wider range area; and this brings higher business IT connectivity. The measurements of the reach and range matrix by Broadbent et al. (1999) can be seen in figure 3.1.2

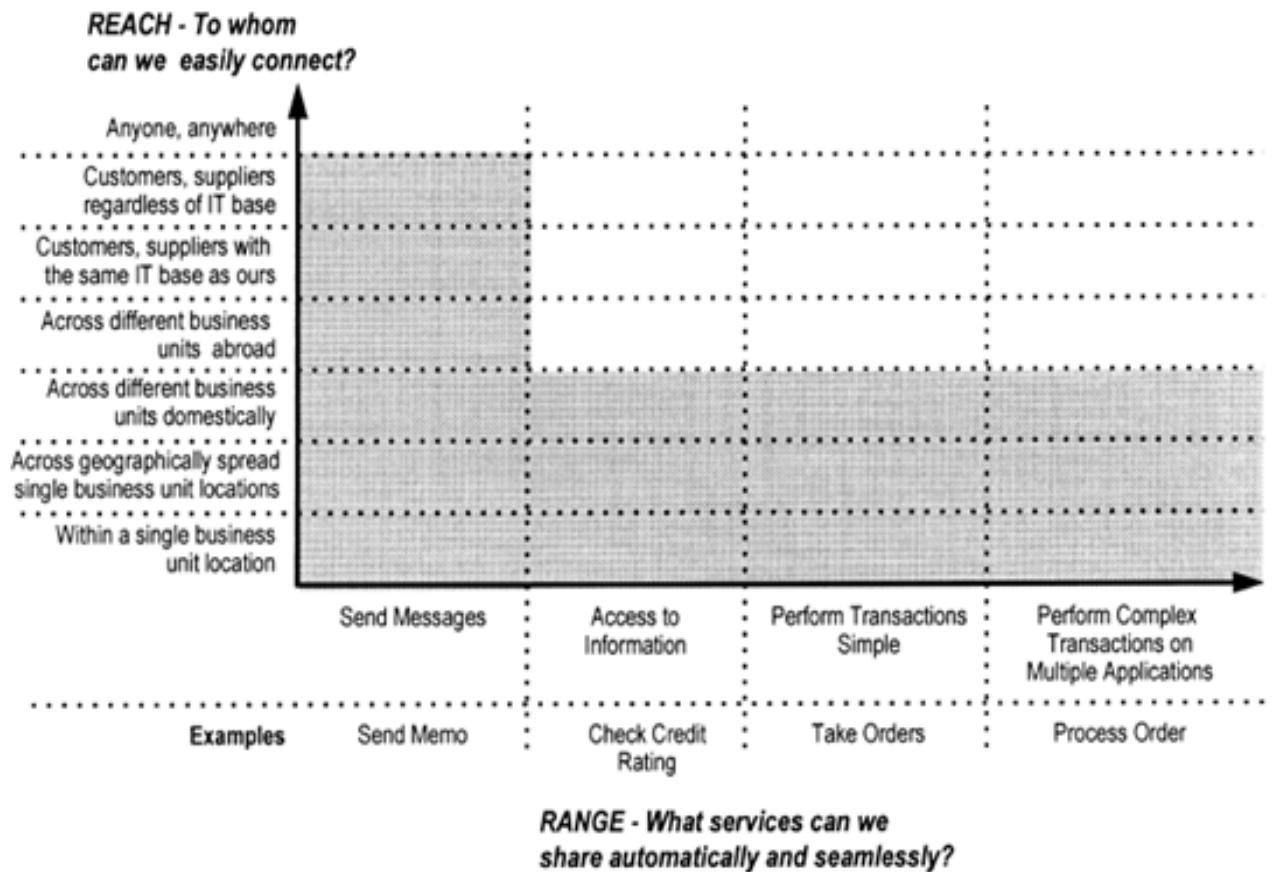


Figure 3.1.2 *The Reach and Range matrix presented by Broadbent et al. (1999) allowing the reach and range of the infrastructure to be evaluated*

For a firm to have the minimum level of maturity in terms of reach and range, it has to have IT infrastructure that covers all the shaded blocks in the figure above. Based on Braodbent et al. (1999) findings, the shaded area in the figure corresponds to 35 points out of a total 100 allowed by the matrix (each cell in the matrix is assigned a particular score by Broadbent et al.). Therefore, a firm that covers these particular 35 points is said to be of the minimum sufficient maturity for reach and range. The detailed scores given for each of the cells is provided in Appendix 1.

IT capability maturity keywords: Functions ,Reach and range matrix

3.1.2 Information Technology Architecture Capability Maturity Model (IT ACMM)

The capability maturity model assesses maturity levels for different aspects of the infrastructure and allows decision makers to identify an improvement path. The model harbors maturity levels from ad-hoc stage through middle/immature processes to well managed mature processes (US DoC, 2003). The levels are:

- No architecture
- Initial

- Under Development
- Defined
- Managed
- Optimized

After the mapping of architecture capability maturity in first two steps, another tool takes place to understand the overall IT maturity of the company. This tool is Architecture Capability Maturity Model Scorecard. This model divides enterprise to nine different elements and maps the whole maturity of the IT architecture related to these elements.

1. Senior management involvement.
2. Operational unit participation.
3. IT security.
4. Architectural processes.
5. Architectural development.
6. Business linkage.
7. IT investment and acquisition strategy.
8. Governance.
9. Architectural communication

The nine elements regarding IT architecture maturity as described by US DoC (2003) are summarized below:

IT investment and acquisition strategy

The IT investment and acquisition strategy of the organization affects the development and long term capability of the IT infrastructure. In the IT ACMM this concept investigates how the enterprise architecture affects the IT investment and acquisition strategy. The measurement range from no formal IT investment and acquisition strategy to a disciplined control and renewing process regarding their investment and acquisition strategies. By achieving a higher maturity in this element of IT architecture the organization can more effectively invest to align the infrastructure with the overall strategic objectives.

Senior management involvement

Controls if the projects are seen as business initiatives - not IT projects and have a strong commitment from the top management. The element relates to the question however the managers and employees understand the need of senior management involvement in long term change processes with supporting architectural standards or they think that everything is fine the way it is and no need for senior management on the way of working.

Operational unit participation

In the model, this measurement targets how integrated the functional and operational parts of the organization are in the decision making and design of the IT infrastructure. By including operational units in the IT development processes the architecture will have a greater chance to be designed and aligned according to the core demands of the organization.

IT security

One of the most important milestones for companies is securing what they learned so far. Experiences are vital for companies who are trying to be in a better position within their competitive area. These experiences can be stored and used as knowledge regarding the activities and processes within the organization. IT architecture harbors every important data and values for company to operate. Any type of harm can turn to fatal problems within the company. This section checks if they are aware of these consequences and awareness and considerations about IT Security within the organization.

Governance

In the model, the governance measurement investigates to which extent IT architecture governance processes are formalized and supported. By formulating clear and explicit ownership and goals for the IT architecture processes the organization will be able to control and drive the process with increased maturity.

Architectural processes

This concept checks is if there is an established IT architecture process. Levels for this concept change from “no architecture processes exist” to “well developed architectural processes and mature procedures for architectural process optimization”(US DoC 2003,p.5).

Architectural development

To initiate a development process related to organizational infrastructure, first of all documentation of the previous systems design and capabilities needs to be secured. This element investigates the documentation of the architecture processes and is there any standard for architecture development processes. Levels for this section can change from “no architecture documentation to speak of” to “Defined documented IT architecture metrics are used to derive continuous process improvements.” (US DoC , 2003, p.5)

Business linkage

The business linkage of IT architecture development and control processes give an indication of how integrated the architecture is in the organizations core activities. By transferring from an informational storage or transactional perspective of IT to a business driver the IT architecture can be developed and controlled on a strategic level.

Architectural communication

This concept concerns IT Architectural maturity from three perspectives; *Architecture education*, *IT architecture process documentation*, and *Electronic availability of the IT architecture content*.

- Architectural education: To what extent is architecture education done across the business on the IT architecture process and contents.
- IT architecture process documentation: To what extent are the decisions of IT architecture practice documented?

- Electronic availability of the IT architecture content: To what extent is the content of the IT Architecture made available electronically to everybody in the organization?

Keywords for IT architecture maturity: Senior management involvement, Operational unit participation, It security, Architectural processes, Architectural development, Business linkage, It investment and acquisition strategy, Governance, Architectural communication.

3.1.3 Level of infrastructure homogeneity

Standardization in working environments and the instruments are vital in large companies. According to the size of the company processes their administration can become more complex. Different software can have different types of outputs and this different type of output can need a transformation to be useful for next processes. “Quite often companies are faced with the need to exchange data in dissimilar formats or between databases” (Rob, Coronel and Crockett, 2008 , p.529). This kind of homogeneity can only be solved by using same/sibling software. Different types of software, needs different types of hardware specifications and different types software also requires some level of qualification of hardware. All these requirements can be solved by discovering a top hardware level depending on the program specifications. This top level can be the base level of the “hardware specification levels” which supports all required software.

Hardware homogeneity

The hardware that supports the infrastructure is constantly evolving as technology progresses. As a result of this, hardware specifications can become easily outdated. Different software systems can require different hardware specifications and before implementing a firm-wide software all the requirements need to be full filled. Homogeneity of the hardware systems can decrease the risk of having problems which appears form hardware adequacy and compatibility. Rob et al.(2008).

Software homogeneity

For an efficient IS infrastructure, companies need to have compatible software programs and overall homogeneity of the software programs used in the company terminals. Homogeneity is important in the implementation of new types of software, due to the different types of software within the organization, many considerations and adoptions needs to be done in order to secure connectivity between different systems. To accelerate the speed of pre-implementation phases for firm-wide software systems such as ERP or CRM, software homogeneity can be an important factor. Some software is designed to be compatible with other software like Microsoft Office applications and Microsoft Dynamics AX. In that sense standardization of the software for business purposes across the organization affects IT maturity of the organization. (Rob et al.,2008)

Infrastructure homogeneity keywords: Hardware ,Software

3.1.4 IT Maturity model for IT Maturity based on the literature review:

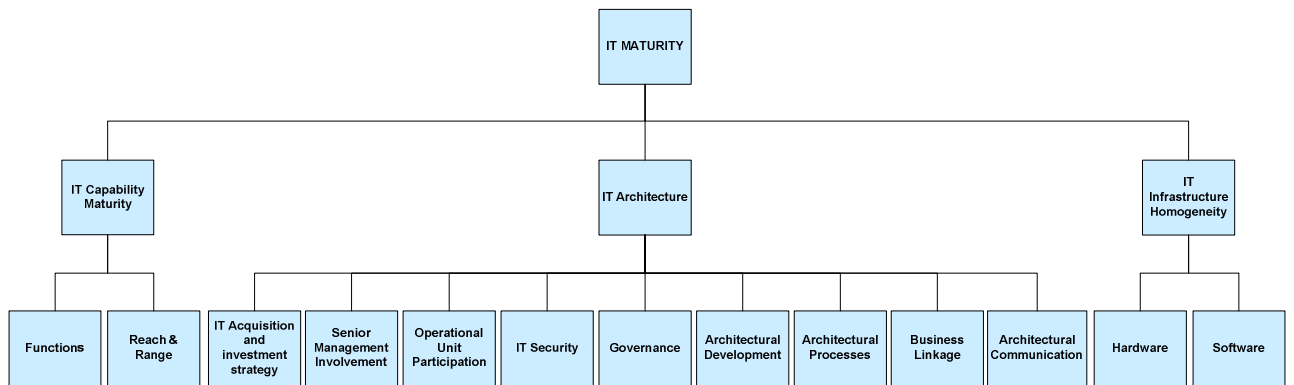


Figure 3.1.3: Shows the maturity aspects selected for the CMAT according to the literature review of the IT perspective of the model.

3.2 Process Maturity

By adopting effective management of processes virtually every industrial area has been able to reduce costs, improve their product quality, lower their lead times and witness an increase in their profits (Hammer, 2007). This shows the importance of both designing as well as managing the organizations processes effectively and efficient. By measuring how adept an organization is at both managing and designing their individual processes (Business Process Maturity) as well as managing and designing the whole network of processes (Business Process Management Maturity) a strong indication of the maturity of the organization should be able to be formed (Hammer, 2007).

Fisher (2004) reasons that a complex concept such as organizational process maturity cannot be measured and displayed in a simple way, and argues that maturity levels are 1) multi-dimensional and, 2) non-linear. Fisher (2004) highlights the need of analyzing process management maturity from three core perspectives: *People*, *Process* and *Technology* as well as two extended perspectives: *Alignment* and *Governance*. The *People* perspective measures aspects such as the skills of the process performers, the overlaying organizational cultures effects on the processes and how the organizational structure affects the process performers' abilities to perform the processes in a mature way. The *Process* perspective deals with the practices and operating methods that the process is designed around. *Technology* deals with the surrounding IT infrastructure and supporting IS systems that interface with the processes. *Strategy* is used as a measurement of the positioning and focus of the company as an indicator of the organizations available support for mature processes. The final perspective is *Controls*, which contains metrics, as well as management and administration maturity of the organization as an indicator of how well processes are managed. Fisher (2004) further argues that the three core perspectives are insufficient; if the three core perspectives are not aligned with the overall strategy of the company they will not create the "right" value and maturity. Likewise, if the core process maturity indicators are not controlled and managed in a mature way the processes will not be able to deliver the promised value.

The second part of the analysis model from Fisher (2004) consists of guidelines of how the non-linear assessment presented of how mature the process management maturity is in the organization should be interpreted. Fisher (2004) argues that each of the previous mentioned perspectives can be defined as being in one of five different maturity stages, where the defined stages reach from;

- Siloed
- Tactically Integrated
- Process Driven
- Optimized Enterprise
- Intelligent Operating Network.

Due to the non-linearity of the analysis model, as shown in Figure 3.2.1, different amounts of "work" is required for moving between the levels of maturity depending on the organization and the involved processes. At the same time different dimensions will play different roles in the transition between different maturity stages, and therefore be

of varying importance in different stages of the model. The different levels of maturity as defined by Fisher (2004) are described more in detail below:

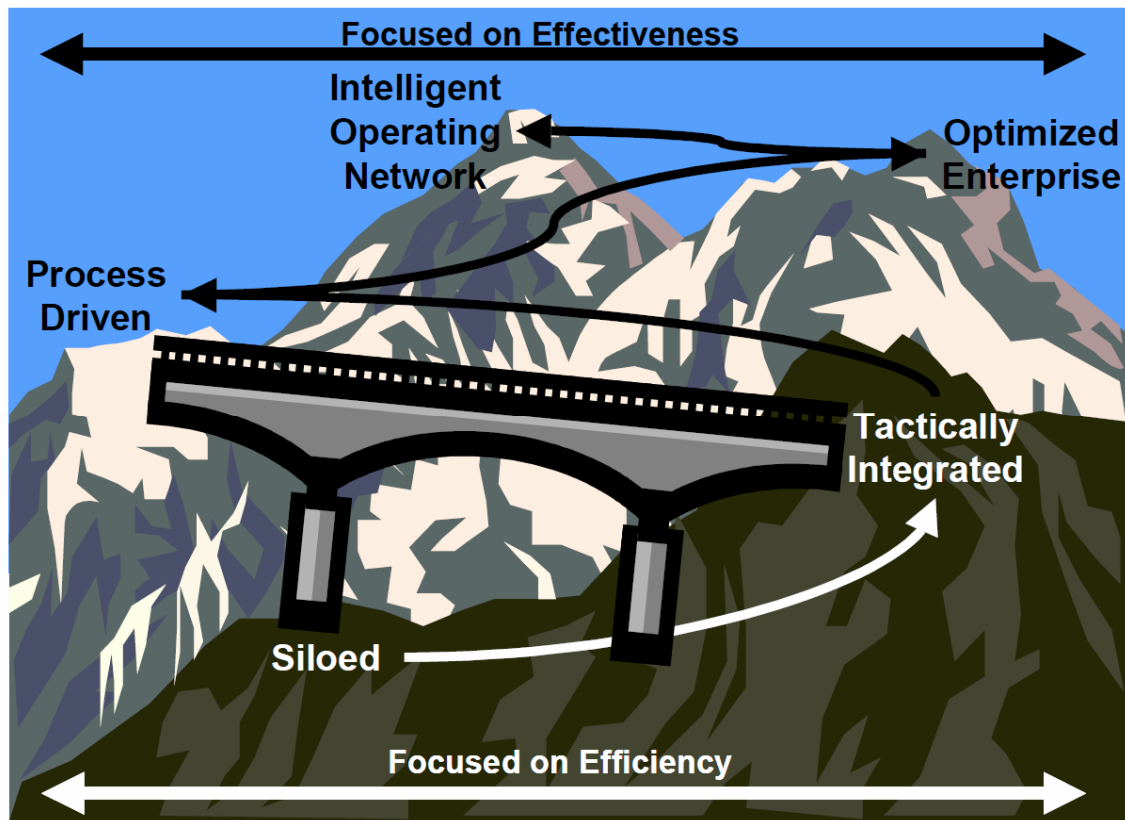


Figure 3.2.1: Shows the non linear maturity model for business process management proposed by Fisher (2004)

i. Siloed

Siloed is the default position of maturity in Fishers (2004) process maturity model. The organization is organized and/or functioning as functional, geographical, or product line silos. Change and improvement initiatives mainly arises from optimization of the “home” silo, but does not connect to the overlaying organizational strategy or take on the perspective of end-to-end solutions. Information and knowledge does also suffer from the silo mentality causing decision making to be slow and sometimes based on ambiguous information due to separated information systems.

ii. Tactically integrated

The next step in the maturity model is the tactically integrated level. This stage of maturity is met when the organization has begun the process of integrating the different parts of the organization, often being an initiative of the IT-department or through the use of “new” IS/IT-solution within the company. By standardizing the data integration and retrieval interfaces of information through an unified IS/IT solution the organization has the opportunity to make better informed decisions and improve their working efficiency. However, at this maturity level the organization does not reason in terms of end-to-end processes and aligning different silos from an overlaying strategic perspective. The governance of other resources than IT is still fragmented and sub-optimized and re-

sistance is to be expected upon further integration and reorganization to better suit a more unified alignment of resources. The people aspect of the organization does not yet recognize the end-to-end process model of how to organize and work within the organization.

iii. Process driven

Process driven is the maturity level of organizational maturity that enables the organization to embrace a more mature way of managing and working with processes. This requires substantial effort for all perspectives and is only satisfied once process enabled thinking is anchored in both the people and management which needs to be instanced by strategically aligned processes and supported by an agile infrastructure. This often requires a top-down mandate and firm leadership to force the organization through this often painful road.

iv. Optimized enterprise

The next step of the maturity levels is the optimized enterprise. After reaching the level of 'process driven organizations', the next maturity level is reached when the organization have begun optimizing and aligning all parts of the organization. The organization is aiming for continuous improvement and is developing the necessary metrics and control functions to ensure this work is carried out in a effective way. The organization is now dedicated to process and team based work and process based thinking influences everything from planning to execution.

v. Intelligent operating network

The last and highest levels of maturity of the dimensions in the model is the intelligent operating network. This is defined as a state where the aspects of an optimized enterprise continue to expand and improve in all dimensions and reach out to suppliers and customers forming an integrated ecosystem. Partnerships where all included organizations seeks to optimize from an end-to-end perspective where all parts recognize their responsibilities in the supply chain. This goes below point to point integration that is achievable in lower instances of the model and requires a collective set of strategies, controlling functions, culture and technologies to be integrated and aligned for optimal efficiency.

Fisher (2004) defines the model as being prescriptive instead of being just descriptive; the model aims to not just describe how mature the process maturity of the organization is, but also describe steps of how to further advance the maturity levels from all five perspectives.

Fisher (2004) keywords for process management maturity: Non linear measurement, multidimensional

The maturity perspectives: *People, Alignment Governance, Process, Technology*

Rosemann (2005) defines a number of factors as the most critical for the success of business process management within an organization, these are; 1) Aligning the BPM approach with corporate goals and strategy on an enterprise level, 2) Focus on custom-

ers and their requirements, process measurement and improvement through well developed metrics, 3) The need for a structured approach to BPM, 4) Top management commitment, 5) Benchmarking and 6) Process-aware information systems and infrastructure alignment.

The model shares resemblance with the CMM (Capability Maturity Model) where five stages of maturity have been defined, these are:

1. Initial State,
2. Defined,
3. Repeatable,
4. Managed, and
5. Optimized.

The definition of the five different stages has been provided more comprehensively defined in the BPM maturity model compared to the original CMM in order to more exactly describe the different aspects of business process management maturity instead of the capability maturity that were the original unit of measurement. The model retains the pre-requisite method where in order to reach level four; the previous levels of maturity must all still be fulfilled in order for the factor to be described as a higher level of maturity. The maturity levels are described in Figure 3.2.2 below.

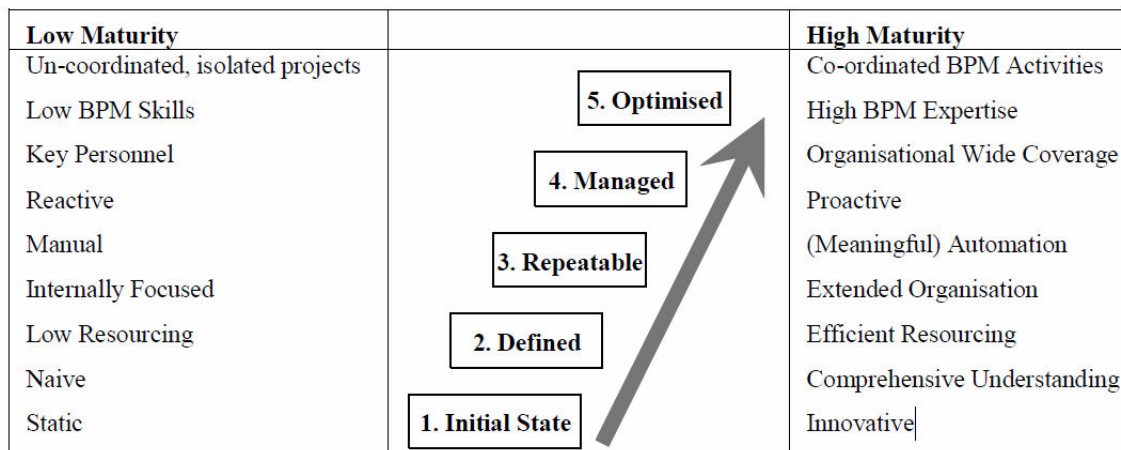


Figure 3.2.2: Describes the maturity levels and their characteristics as proposed by Rosemann (2005).

The model by Rosemann (2005) measures business process maturity from the two perspectives of coverage as well as proficiency of BPM. In this model, coverage relates to the measurement of how widely the BPM capability is spread within the organization as well as the implementation level of BPM where it is adopted. Proficiency measures the scope and effectiveness of the BPM related activities in the organization.

Coverage is defined as “how far” the business performance management has been implemented in the organization in terms of:

- The number of processes included in BPM practices.
- Staff involvement / level of staff undertaking BPM activities.

- Links to other management tools (such as budgets, KPI, organizational charts, among others).

The proficiency relates to the question of “how well” the activities within that can be defined as part of BPM are executed and managed, this is measured by three aspects which are:

- Response to BPM issues and initiatives.
- Frequency of conducting BPM activities and initiatives.
- Suitability of BPM tools, resources and practices.

The proficiency measurement is further expanded into five factors of organizational maturity, these are:

- *Information Technology and Systems (IT/IS)*: This aspect relates to how developed and suitable the IT/IS infrastructure is for BPM as well as the actual proficiency of utilizing IT/IS in these activities.
- *Culture*: The acceptance and general opinion regarding the effectiveness of adhering to business process management activities widely affects how effective these types of initiatives will be in the organization.
- *Accountability*: This aspect aims to measure how responsibility and accountability are assigned, distributed and affecting the management and performance of the processes within the organization.
- *Methodology*: The capability and formality of the business performance management activities conducted within the organization.
- *Performance*: The level of effectiveness of BPM and its instances throughout the company as parts of a process or unit.

The process maturity assessment model proposed by Rosemann (2005) is shown in Figure 3.2.3 below.

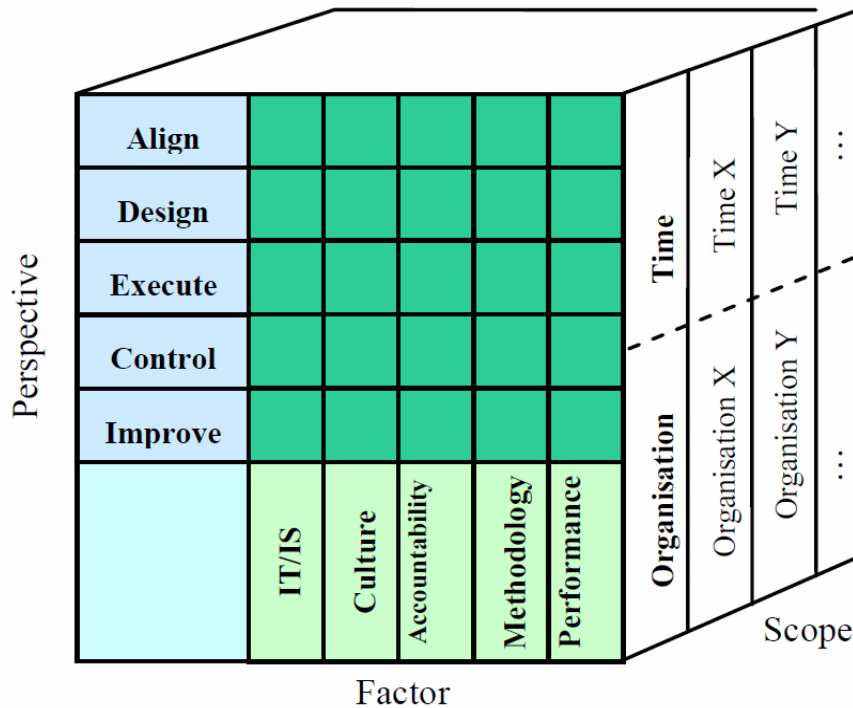


Figure 3.2.3: Shows a process management maturity assessment model design as proposed by Rosemann (2004).

Rosemann (2004) keywords for the process management maturity:

Five maturity perspectives: 1. *Information Technology and Systems (IT/IS)*, 2. *Culture*, 3. *Accountability*, 4. *Methodology*, 5. *Performance*

Two separate measurement areas: *Coverage and Proficiency*

Hammer (2007) reasons that the relationship between processes and organizational performance goes all the way from the initial process design to the attitudes of the process performers. The design quality of a process is a mixture of how well thought of and defined different aspects of the process are, for example; the specification which people that should execute the activity and which tasks that are included in the process. Other aspects are; in what order the tasks are executed, in what location tasks are performed as well as under what circumstances, with what information and to what degree of precision the tasks should be carried out. By measuring the maturity of the organization with regards to how these aspects are handled Hammer (2007) argues that one can extract vital knowledge regarding the maturity of the process related activities in the organization.

There are five *process enablers* as defined by Hammer (2007). These are:

- **Design:** The complexity of the process design and comprehensiveness of the specification of how the process is to be executed.
- **Performers:** The level of skills and knowledge of the people who execute the process
- **Owner:** The presence of an executive who has responsibility for the process and its results and the involvement of the executive branch in process management.
- **Infrastructure:** Information and management systems that support the process.
- **Metrics:** The measures the company uses to track the process' performance.

The *Design* process enabler has already been discussed above; the *Performer* perspective addresses the ability, skills, and motivation of the people performing the process. *Owner* is a measurement of how mature the ownership, authority and responsibility definitions are and how the power is distributed in practice. *Infrastructure* relates to IT and HR systems and how aligned they are to the processes and their ability to support processes. *Metrics* is the maturity measurement of how the processes are measured, where a more mature metric score allows processes to be more accurately managed due to the higher availability of information regarding the process performance. The process enablers in Hammer's maturity framework are designed to be mutually interdependent; for example without mature infrastructure and performers a high maturity design will not be able to utilize all its advantages compared to a less mature design.

The second part of the framework Hammer (2007) developed deals with the environment the processes are surrounded by. In order to sustain high performance processes there needs to be a supportive environment consisting of *leadership*, *culture*, *expertise* and *governance*. These are by Hammer (2007) called enterprise capabilities and are defined as:

- **Leadership:** The senior executives who support the creation and management of processes and process programs.
- **Culture:** The values of customer focus, teamwork, personal accountability, and a willingness to change.
- **Expertise:** Skills in, and methodology for process redesign.
- **Governance:** Mechanisms for managing complex projects and change initiatives. Companies can use their evaluations of the enablers and capabilities, in tandem, to plan and assess the progress of process-based transformations.

Leadership maturity is related to how upper and middle management are involved and supporting the process mentality and execution in the organization. *Culture* is in this framework related to the organizational culture regarding the usage and faith in process based activities. *Expertise* is a measurement of how mature the knowledge base regarding processes and the management of processes is developed in the organization. *Governance* pertains to the maturity level of the controlling functions of the enterprise and how the cluster of processes in the organization is controlled.

Hammer (2007) keywords process maturity and process management maturity:

Process enablers: *Design, Performers, Owner, Infrastructure, Metrics*

3.2.1 Process maturity discussion

Rosemann (2005) joins both Hammer (2007) and Fisher (2004) in arguing that process maturity measurement should be conducted with a simpler model rather than a complex one. A more complex model has the ability to provide a potentially higher level of description and measurement of reality but the simpler variant has the advantage of being easier to understand and leads to a higher level of user acceptance. This is however not as evident in the instantiation of Rosemann (2005) and Fisher (2004) compared to Hammer (2007) due to the multidimensional and non linear measurements. Maturity levels such as “intelligent operating network” that is used in Fisher (2004) are not as straightforward to use compared to the numerical maturity levels used in Rosemann (2005) and Hammer (2007). Hammer’s (2007) framework is designed to be able to be used by non-experts when evaluating the organizational maturity and the interface of the tool is designed for simplicity and a high usability instead of aiming to be an advanced and highly accurate method of analyzing maturity.

Hammer (2007) supplies the most complete framework for analyzing process management maturity as the model incorporates the largest part of the keywords and measurements discussed in Rosemann (2005) and Fisher (2004), this is shown in table 3.1 that summarizes the similarities and differences in the concepts covered by the three frameworks. The framework supplied by Hammer (2007) will therefore be the main theoretical component used for process management maturity in the CMAT.

Table 3.2.1: Lists the concepts included in Hammer (2007) and how they are related to Rosemann (2005) and Fisher (2004) models for process management maturity.

Hammer (2007)	Rosemann (2005)	Fisher (2004)
<i>Design</i>	N/A	<i>Process</i>
<i>Performers</i>	N/A	<i>People</i>
<i>Owner</i>	<i>Accountability</i>	N/A
<i>Infrastructure</i>	<i>Information Technology and Systems</i>	<i>Technology</i>
<i>Metrics</i>	N/A	N/A
<i>Leadership</i>	N/A	N/A
<i>Culture</i>	<i>Culture</i>	N/A
<i>Expertise</i>	<i>Methodology</i>	N/A
<i>Governance</i>	<i>Business process management coverage, Performance</i>	<i>Governance, Alignment</i>

3.2.2 Process maturity model based on the literature review:

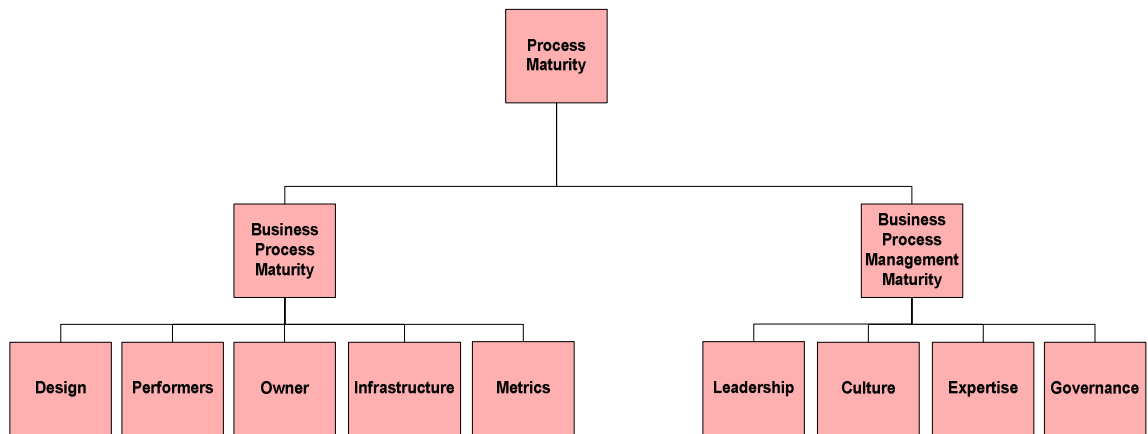


Figure 3.2.4: Shows the maturity aspects selected for the CMAT according to the literature review of the process perspective of the model.

3.3 Cultural Maturity

The cultural perspective in the literature review aims to identify and capture aspects of an organization that is related to the collective attitudes and mind-sets of the organization. The chapter is divided into two main categories; readiness for change and organizational attitudes.

3.3.1 Readiness for change

Due to the rapid advances in business enabling IT technology in conjunction with today's competitive and global business environment organizations are forced to make decisions regarding change much more frequently than before. An organizational trait that has been widely discussed is the ability to conceive, go through and accept changes. Organizations that are more likely to go through change in a successful way are perceived as dynamic and as being mature and strong enough to go through painful change. Implementing and successfully maintaining organizational wide information systems has historically proven to be a painful experience for many organizations, where numbers reaching 60-90% of attempted ERP implementations failed to be perceived as successful by the implementing organization (Kwahk & Lee, 2008). One of the main reasons for the low success of implementation projects in this area is claimed to be the resistance to change of the implementing organization. An enterprise wide implementation of an IS system may cause major change to the business processes, the organization itself and its power structure. (Kwahk & Lee, 2008).

The concept of "Readiness for change" can be defined as the extent organizational members perceive change in their organizational context. Kwahk & Lee (2008) divide readiness for change into two main categories of factors, the *organizational commitment* and the *perceived personal competence*. *Organizational commitment* relates to the factors that enable the individuals of the organization to accept "pain" related to the change due to their loyalty or affection for the organization. *Perceived personal competence* is the placeholder for aspects related to the individuals self efficacy and confidence. This is based on the premise that an organization with numerous individuals that perceive themselves as being competent and able to perform well in previous unknown environments will have a higher acceptance of both self initiated and forced change (Kwahk & Lee, 2008).

According to Kwahk & Lee (2008) the prime purpose for managers trying to create an environment with a high readiness for change should not be to decentralize decision making regarding change or try to have the change initiated from the grassroots; change decided on the senior management level forced down the ranks has proven to be as successful as bottom up initiatives. Organizational members have a higher probability of being productive during and after the change process if they believe in the change initiative and that the employees themselves will fit into the changed organization.

Aladwani (2001) argues that when implementing an enterprise resource planning (ERP) system or a similar large IS, top management commonly faces an unwanted attitude from potential users –for one reason or another they choose to resist the implementation process. Resistance to change in companies can be observed as; persistent reduction in output, requests to change the working area or even employees quitting their jobs, Con-

sequently, Jarar , Al-Mudigimh, and Zairi (2000) argues that ERP users need to make sense of , and understand , their reactions to this technology, and their changing computer environment and computer-related tasks in order for change to be accepted.

Keywords for change readiness: Resistance to change, Attitude towards change, Change readiness, Perceived personal competence

3.3.2 Organizational attitudes

A decision to implement an ERP system is usually affecting the whole organization and most of the administrative personnel might find themselves in a situation where large changes to their ways of working might be subject for a complete reengineering. Due to the repercussions of a project this large the decision to invest is usually taken at the top senior management level. This might reduce adoption rates of the IS innovation as the decision and the changes it brings forth is forced down the ranks of the organization. The implementation of an large enterprise wide IS innovation such as an ERP forces the users to adhere to an alien system and its infrastructure which can cause a significant change of ownership attitude among the users compared to internally homegrown systems (Milford, Jewels, , Hunter, , Hunter, 2000).

Milford et al. (2000) describe implementation of an ERP system to be a technological diffusion run through a social system of three phases; introduction, adoption and diffusion. Through the social process there are three main cultural inhibitors, these are; the relationship between business and IT, the previous history of adoption of IS/IT innovations and lastly the influence and attitude of highest ranking IT executive.

In addition, Milford et al. (2000) describe four main types of organizational obstacles that will obstruct the implementation and adoption of IS innovations. These organizational obstacles are: Bureaucratic complexity, Personality conflict, Technical complexity and acute resource scarcity.

The desired cultural relationship with IS adoption is in many cases different from the actual culture. If there is a gap in terms of adoption inhibitors or change readiness related factors resistance to the implementation and adoption of the IS innovation risks affecting the end result and usage of the innovation. Milford et al. (2000) split the resistance into two main categories; the undermining of the implementation process and the obstruction of creating an adoption friendly climate.

Keywords for organizational attitudes: The relationship between business and IT . Influence and attitude of highest ranking IT executive (Business sponsor of IT)

Luftman (2000) reasons similarly to Milford et al. (2000) regarding using the communication between persons, departments and organizations as an indicator of the maturity level of the organization. A culture that supports effective exchange of ideas and effortless sharing of information will be able to react more agile as well as more easily adopt and align the organization to strategies and external environmental factors. It will also

enable a higher level of understanding between departments and units within the organization.

Keywords for organizational attitudes: Organizational attitudes: Protocol rigidity, Understanding of business by IT, Understanding of IT by business

In addition to aspects related to communication Luftman (2000) argues that the management attitude present in the organization gives an indication of how effective the organization will be in handling organizational stress and unforeseen problems. According to Luftman (2000) the informal prioritization process gives an indication of how mature the organization is in regards to day to day operational management as well as overlaying strategic governance. The prioritization process is combined with evaluations of the management structure and style together with the power distribution (Locus of power) to form a complete evaluation of management related cultural aspects that might affect the maturity level of the organizational attitudes (Luftman, 2000).

Keywords for organizational attitudes: Prioritization process, Management structure, Management style, Locus of power

Another aspect covered in Luftman (2000) regarding organizational alignment maturity is the partnership between IT and Business within the organization. By integrating and aligning the business operations together with IT the organization can achieve a state where IT both enables and drives the business forward. Due to the importance of IT support for most of today's enterprises, having an organization that supports and welcomes IT as a business driver can be an indicator of maturity.

Keywords for organizational attitudes: Business Perception of IT / Attitude towards IS/IT

3.3.3 Cultural maturity model based on the literature review:

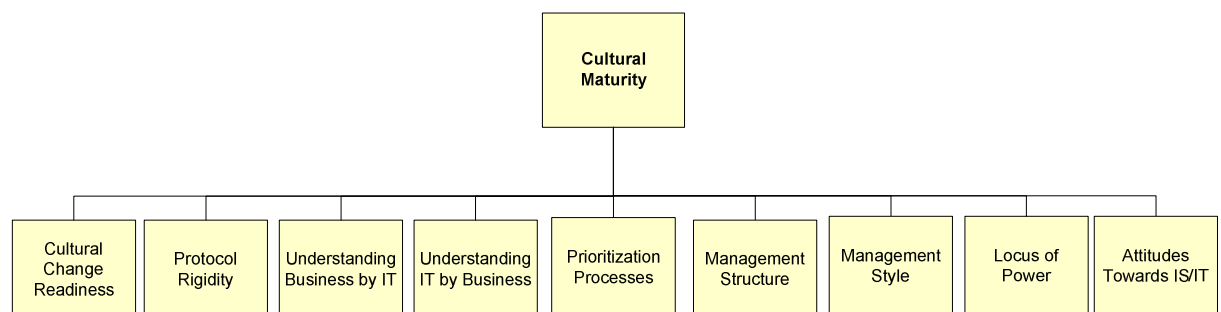


Figure 3.3.1: Shows the maturity aspects selected for the CMAT according to the literature review of the cultural perspective of the model

3.4 Business Governance Maturity

Business governance is a term used for the perspective in the literature review that targets concepts related to the formal, planned and tangible management activities as well as disciplines that are present in the customer organization. The chapter is divided between the concept groups of; Change management maturity, Knowledge management, Strategic Alignment, Business metrics, Service Level Agreements, Strategic planning and Project management.

3.4.1 Change management maturity

Many large organizations have reserved big amounts of money for their whole ERP investments while they were drawing up their budget. “About half of ERP projects fail to achieve hoped for benefits because managers underestimate the efforts involved in managing change” (Pawlowski, Bourdreau, & Baskerville, 1999).

Globalization and the current economic climate forces companies to change quickly and frequently. Changes can be sometimes large and more frequent and depending on this, companies need to change more professionally to prevent from time consuming and unexpected results of lack of adaptation. Change management is very essential for major system implementations and shows which way to use during the change phases and prepares the organization for changes. Companies who can change more professional and can see the change as a routine business in their working schedule became more successful. Due to the globalization and rapid advances of IS support many organizations finds themselves where “A changing marketplace, empowered workforce and technological advancements have created an environment where change is becoming business as usual” (Prosci 2004 p.2).

There are many different views and perspectives about change management maturity. According to Powell (2008) change management maturity have five factors which affect business operations. Change scheduling, automation, process adaptation, change testing environment and completeness of change testing. Figure 3.6 below illustrates these five factors with business benefits.

	Fewer Production Problems	Lower Percent of IT Staff Devoted to Change Management	Fewer Emergency Changes	Greater Confidence in Changes	Smooth Change Management Process
Regularly Scheduled Changes	✓	✓	✓	✓	✓
Change Management Automation	✓	✓	-	✓	✓
Testing Environment	-	-	✓	✓	✓
ITIL Adoption	-	-	-	✓	✓
Test Against Entire Stack	✓	-	-	-	✓

✓ Significant impact identified - No significant impact identified

Figure 3.4.1: Business Benefits of Change Management Maturity presented in Powell (2008)

ERP innovation implementation model incorporating change management

For an organization to be mature in adapting to external and internal forces of change there are many aspects of the organization that need to be able to cope with the associated responsibilities that follow the successful management of change. Five critical areas in this field are: top management support, business case management, change management, project management and training. One of the main reasons of the low levels of successful ERP implementations is the absence of high level change management during the implementation process. Kemp & Low (2008, p.2) define implementation of an innovation as “the process of gaining targeted employees’ appropriate and committed use of an innovation”.

Following this definition Kemp (2008) argue that the main objective of the change management should be a constant focus on creating and sustaining an environment which is favorable for change initiatives. In order to achieve these activities such as: project championship, employee training, communication of system features and benefits, communication of new business processes and organizational change.

Managing an organizational wide climate that is supportive of the IS innovation creates a positive attitude towards both the implementation process and the implementation object itself. By managing the whole process of change during the implementation procedure on both enterprise, departmental and individual levels in conjunction with a strong positive implementation climate the potential of a motivated workforce ready to adopt the innovation increases. The relationship between activities defined as change management and the implementation climates effect on the implementation effectiveness is shown in figure 3.4.2 below.

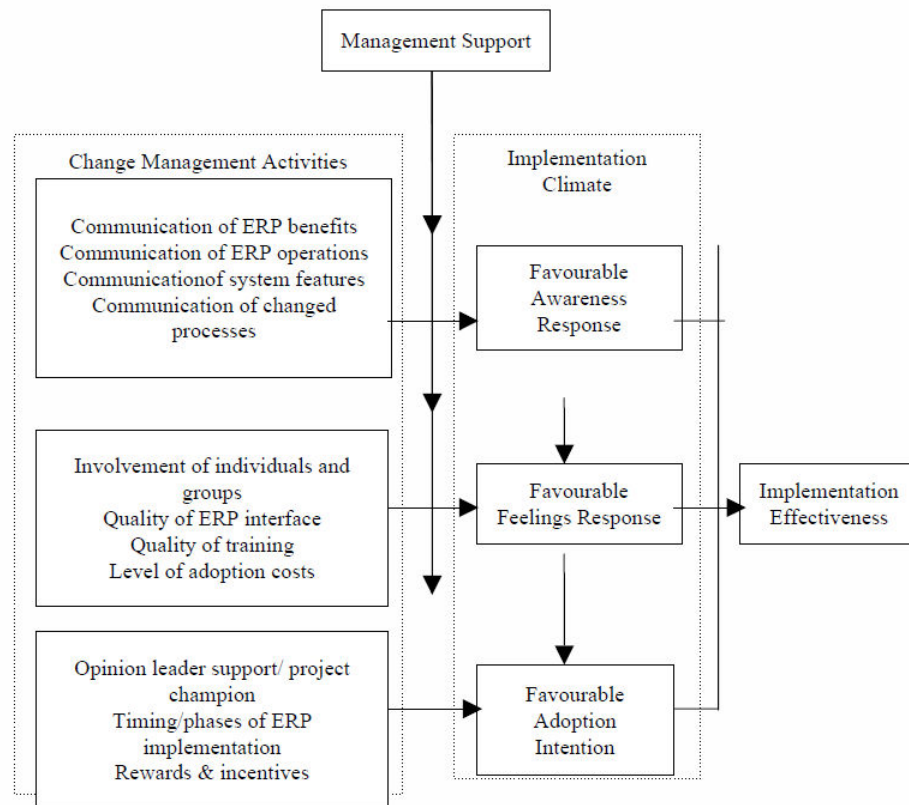


Figure 3.4.2: *Kemp & Low (2008) Illustrate the relationship between change management activities and implementation climate effectiveness*

Prosci (2004) presents a change management maturity model which is based on benchmarking research and interactions with companies going through change. The model explains different levels of the change management capability of an enterprise. Levels of change management maturity model vary from level one “no change management” to level five “organizational competency”. Each level has different stated characteristic situations.

First level is “initial” overall change management. In this level user groups do not know anything about the change. Project managers do not care about abstract situations and facts of change only cares funding, schedule, resource management and some other tangible aspects. Communications between elements are very rare. Understanding of first effect of the change comes with internal comments on it not by briefings or presentations. Leaders and managers are also not aware of change.

Second level is called isolated projects. In this stage management of change is included in some of the isolated projects. Communications between parties are more common but still needs more sponsorship. Employees have no scheduled change management training by their managers. The ones who get change management training cannot face new things very fast because of the lack of change management information between projects and they need to re-learn basic change management skills.

Third level is named “Multiple Projects”. With this level project groups started to have a structured management process, but still they do not cover most of the organization

and there are no standards for change management processes. Communication between project departments are more common even first intention of the change and experiences can be shared. Training of managers and employees are provided and project leaders can educate some of their employees in the future.

Fourth level according to the model is called “organizational standards”. This is the first step of using an overall standard for change. Organization implemented these change management standards to use in new change projects. For this stage change management knowledge is organization-wide. Employees understand and concede the importance of change and change management. Resistance to change expected in some cases though.

Fifth and the top level of change management model is “Organizational Competency”. Change management is seen very important from the beginning till to the end. Effectively managing change is an explicitly stated strategic goal, and executives have made this is a priority. Change readiness is in the highest level with the support of managers and supervisors. As a result of that resistance of change will not seen as a big problem . Change management is second nature - it is so commonplace that it is nearly inseparable from initiatives. Information has been collected by the project leaders for next trainings and future improvements.

Keywords for Change Management Maturity: Training, standards, Communication, Management Support

3.4.2 Knowledge management

This perspective contains all identified aspects related to the management of data, information and knowledge that were able to be related to customer maturity during the literature review. Kulkarni & Freeze (2004) argue that the first step to obtain knowledge is to find it, rather than to try to capture or store it, other authors say: “that which doesn’t get measured, doesn’t get managed” (Redman ,1998, p.80).

Defining the knowledge is one of the critical parts for measuring knowledge management maturity and after defining the knowledge another critical point to assess how mature the organization is constructing the metrics. Knowledge assets are intangible capabilities and there is a recognized need to “make a greater effort to quantify the value of such intangible assets” (Teece,1998; Kulkarni & Freeze, 2004).

Kulkarni and Freeze (2004) present a knowledge management maturity model. This model depends on four knowledge capability areas which are:

- Expertise :The knowledge which gained through experiences or formal educations.
- Lessons learned: Lessons can be seen as past success and failures and learning can be seen the essence of these lessons.
- Knowledge Documents: Expresses obvious knowledge already been published. All kinds of reports, policies, pictures, diagrams, etc. can be one part of this area

- **Data:** Data can be seen as the results or figures of surveys, experiments but this data is not the one being used in the operations but historical data which stored in the databases.

According to this model, knowledge management maturity has six levels from zero to five.

Knowledge sharing is frustrated by organizational culture and most of the units in the organization do not give expected importance to knowledge sharing and do not want to share their knowledge within the enterprise for the “Zero Level”. Knowledge assets are also not recognized in the infrastructure.

Next level and higher level is called the “First Level”. Knowledge sharing in this level is not discouraged and most of the units are willing to share their knowledge in the organization. But only the ones who understand the importance of the knowledge do the sharing. Knowledge assets are identified in the infrastructure.

Third level is named “Level Two”. In this level organization understand the importance of the knowledge assets. “Executive class is supporting knowledge sharing and explicit knowledge assets are stored in some fashion” (Kulkarni and Freeze, 2004).

Next level is “Third Level” and to be in this level employees expected to practiced knowledge sharing and knowledge sharing is a necessary for work processes. Knowledge assets are saved to databases in a way that allows search for them for every parties as a result of using knowledge management tools. After from this level normal work flow encloses knowledge management related activities in it.

Knowledge sharing and related systems are accepted as easy by the employees in “fourth level”. The degree of knowledge sharing is monitored and quantified by the organization. Training about knowledge management is now available. Usability and understandability of the knowledge management activities are improved.

The last level of knowledge management maturity model is “level five”, “The highest level, is reached if an organization not only monitors how well its performing in knowledge management related tasks, but also constantly strives to improve them” (Kulkarni and Freeze, 2004).

Aydin et al. (2005) argue for the advantages for organizations moving into a structured e-learning solution for managing the training and development of the employees. The concept of using deliberate training to ensure employee competency is part of the knowledge management framework concept and therefore included as an aspect to indicate the level of knowledge management maturity.

Keywords for Knowledge Management Maturity: Expertise, Lessons learned, Knowledge documents, Data management, Training

3.4.3 Service level agreements

Service level agreements are internal or external contracts that regulate commitments and regulations for a service (Niessink & Vliet, 1998). Many organizations develop and sell IT services as a business concept and others outsource their needs for IT to IS/IT service providers. There are several examples of these services which range from software, the management and maintaining of workstations to network developing issues. Suppliers and customers require the service agreements to be clearly defined in order to manage and plan the dependent and surrounding activities (Niessink & Vliet, 1998).

According to De Haes and Van Grembergen (2004) there are two important functions regarding service level agreements that must be defined and attained;

- Acceptable service levels by the customer and attainability of them by the service provider.
- Set of indicators of the quality service which is agreed and accepted from both parties.

Keywords for Service level agreements: Acceptable service levels, quality service indicators.

3.4.4 Business metrics

Luftman (2000) describes business metrics maturity as an indicator of how easily the organization can measure and communicate between organizational borders. Especially significant is the alignment between financial and business metrics with metrics describing aspects of IT and HR. By having clear and unified metrics to describe the specifics as well as common concepts within and between departments managers will have the opportunity to improve their management of the organization.

Keywords for Business metrics: Business metrics maturity

3.4.5 Strategic alignment

The range of the available information technology functionality has been rapidly expanding during the last 20 years. This enables decision makers to more rapidly process information to adapt current and form new strategies. By opting out of utilizing information technology or not including strategic concerns regarding IT infrastructure will severely hinder the strategic development of the organization. Some authors even claim that: “Across the wide spectrum of markets and countries, IT transcending its traditional “back office” role and is evolving toward a “strategic” role with potential not only to support chosen business strategies but also to shape new business strategies” (J. C. Henderson & N. Venkatraman, 1999, p.472) . In addition, describing the strategic alignment maturity of the organization gives an excellent vehicle for understanding and

improving the relationship between Information Technology and Business (Luftman, 2000).

Keywords for strategic alignment: Business strategies, strategic role of IT

3.4.6 Strategic planning

Strategic planning incorporates diverse considerations such as human and financial resources, culture and opportunities which together will be evaluated and used as the basis of the strategic direction of the organization. With strategic planning companies can find their goals and outline the borders that they need to stay in to reach their goals (Hackos, 1997). Strategic planning starts with understanding the market place for products and customer needs in that market. Strengths and weaknesses of the company are one of the important factors that affect the strategic planning. These strengths and weaknesses can cause problems for companies who are in the competition for opportunities in the market. By conducting routinely performed benchmarking activities the important information can be obtained regarding other successful strategies and process designs. There are many business analysis techniques to use while stating the strategy for the organization like the; SWOT and the PEST.

Keywords for strategic planning: Benchmarking, Strategic planning

3.4.7 Project management

Many projects undertaken in organizations do not deliver the value that they were set out to do due to inadequate preparation of the organization and the project participants prior to the project launch. Due to the frequency of high importance projects normally observed in organizations today the ability to plan, perform and evaluate projects can be seen as an important skill for all organizations.

According to Robertson (n.d.) project management maturity has five important levels from ad-hoc (Level 1) to optimizing (Level5);

The lowest level of maturity in the framework, ad-hoc, represents a project management environment where there is no formal standardization of project management processes. The organization may struggle with numerous projects where many are incomplete or abandoned. The success of a project is heavily dependent on the individuals in the project management group and project management activities are often not supported by the organization. Experiences from projects are not documented and not used in other projects.

The second level in the maturity assessment is branded as “Foundation”. This level of project management maturity has started to find support from the organization and common tools are used for specific and vital project management processes. Simple project management themes are used for common processes.

With level three approaches of project execution is viewed in a larger scope and more focus is on making the results more reliable. Project management support is now includ-

ing the senior management level. Employees and managers who are going to participate in project development are educated in project management phases. Lessons learned are documented end passing to other projects. Basic projects can be planed, managed, integrated from now on with consistent use of techniques.

Project portfolio management becomes an important and integrated element in the organization's business planning processes in the fourth level of the model. Multiple projects can now be planned, managed and integrated in the organization. Information gathered from previous projects are stored in a database or similar, with continuing projects enjoying support from the information database.

Last and the highest level is "Level 5". Especially the improvements of project management are supported by every unit in the organization and the structure of the organization is now become project-centered. Training of the project managers becomes a career program and training of the employees develop into a key component in staff development.

Keywords for Project Management: Support, Multiple projects, Documentation

3.4.8 Business Governance Maturity Model based on literature reviews:

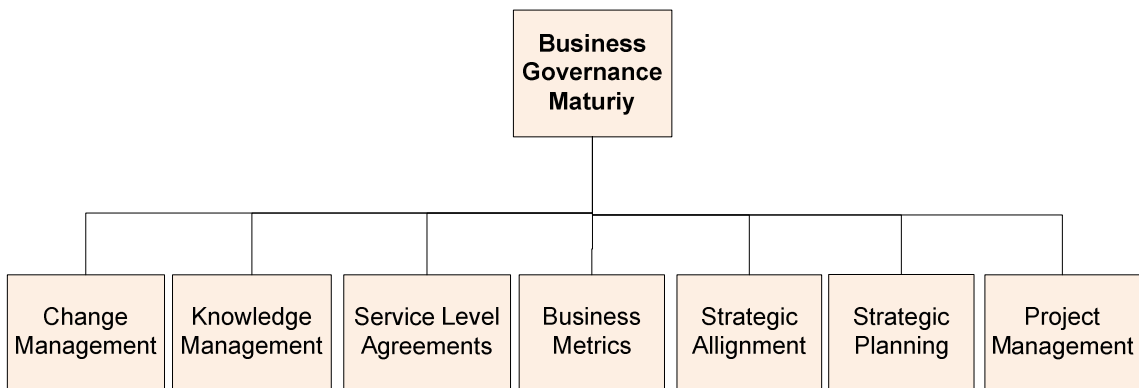


Figure 3.4.3: Shows the maturity aspects selected for the CMAT according to the literature review of the business governance perspective of the model.

3.5 Customer maturity model based on the literature review

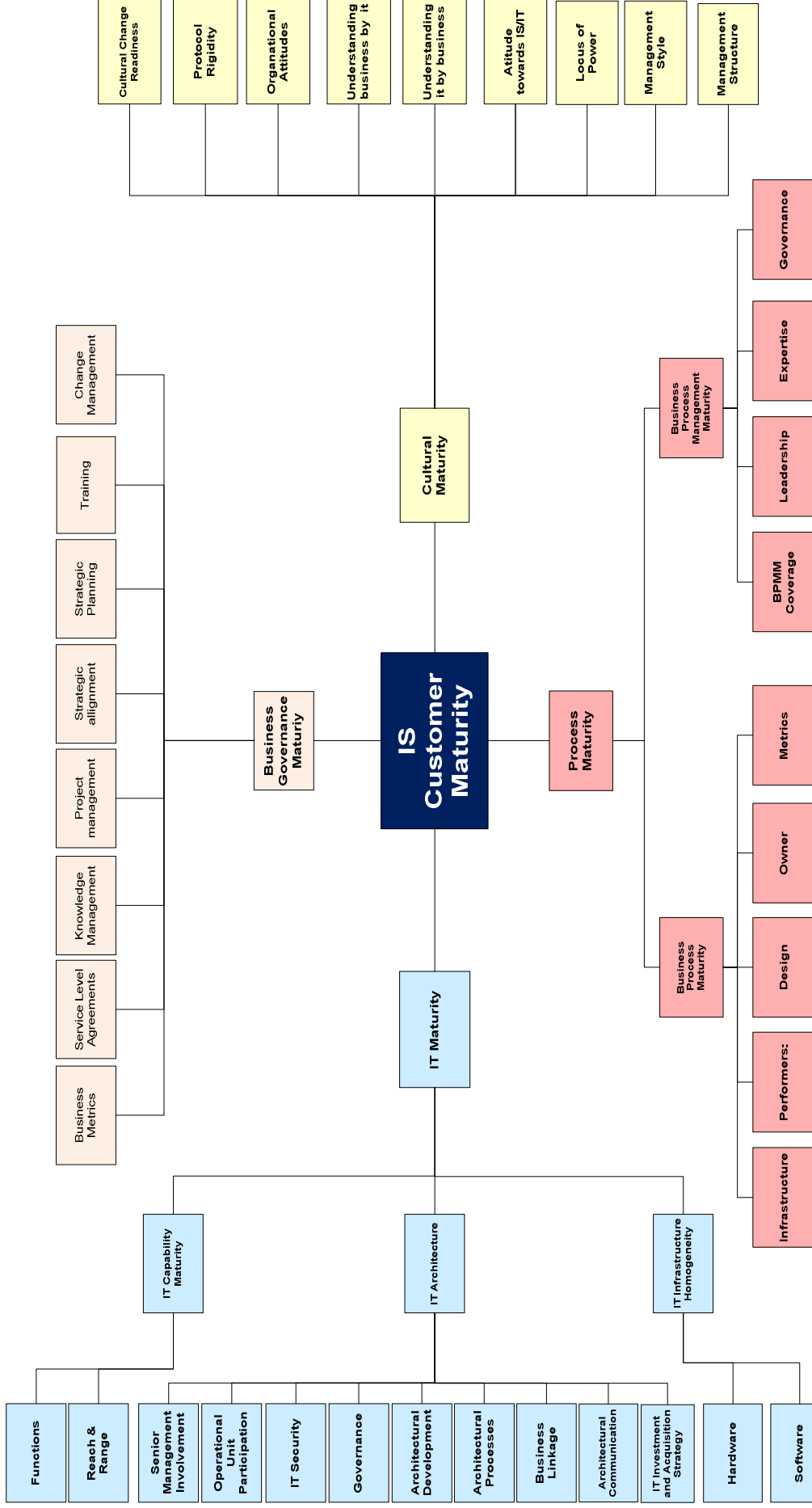


Figure 3.5.1: Shows the concepts to be included in the CMAT according to the literature review

4 Empirical Data

This chapter presents the empirical data collected during the interviews with the case company in order to provide feedback to the CMAT. The chapter is structured according to the feedback received for aspects included in each of the perspectives.

The interviews were conducted at the following dates:

1 st interview	02 February 2010
2 nd interview	23 February 2010
3 rd interview	17 March 2010
4 th interview	06 April 2010
5 th interview	15 April 2010
6 th interview	11 May 2010

4.1 General feedback from the interviews

After the early meetings that topic selection and motivation of the topic took place. Customer Maturity Tool (CMAT) was decided to include concepts from several perspectives, the ones discussed were; IT, Processes, Power structures, Company size, and Standard Operating Procedures. The measurements related to the concepts should be able to be used by both experts as well as non-experts.

Lack of the number of questions and also low understandability of the measurement levels appeared to be evident for most of the concepts in models. Necessity of grouping questions according to customer meetings is mentioned. Questions can be grouped like “first meeting questions” and “Already acquainted meeting questions”. First meeting questions are important for company to evaluate the risk .

Structuring and composition of the model is discussed with the start of third meeting. The third interview was conducted with the goal of discussing and receiving feedback regarding the choice of the 4 main perspectives for the model as well as discussing the appropriateness of the so far identified concepts included in the model. According to the literature reviews the illustrated based on four important perspectives IT, Process, Culture and Management. This method of organizing the literature was deemed acceptable by the company at this point of the work process due to the easy overview and clustering of concepts. Rests of the interviews are done according to these four perspectives and feedbacks are taken according to these perspectives.

4.2 IT

New concepts were discussed starting from the third interview and to be reviewed until every next meeting; IT architecture, Application integration, IT homogeneity (Hardware / software) and senior management involvement in IT processes and planning are the ones from third meeting. After investigating “the homogeneity of the IT architecture”, it is determined unnecessary for the company expectations and hard to relate to maturity during the fourth meeting and removed from the model.

Master data management and (virtualization of mobile Units) is determined a necessary concept to have in the model and needed to be motivated with questions in the tool.

Before the sixth interview all questions and levels are double checked and problematic ones are rephrased. During the sixth interview every concept in the model and question in the tool are reexamined one by one with case company. “Architectural processes” and “architectural development” concepts are stated to be merged to improve understanding of concept. Some questions are determined unnecessary or redundant; these ones are eliminated or rephrased with company experts. Rephrased or eliminated questions were related to concepts; “Functions”, “IT Investment and Acquisition Strategy” and “Operating unit participation”. Rest of the questions are determined essential to have in the tool, at the same time because of touching the core idea with asking question in well formed way and also to show that they are vital for this section some questions are also rewarded with stars.

4.3 Process

During the third meeting feedback were received regarding the concepts relating to individual process maturity. This was deemed to bring little value to the total assessment as individual process evaluation would be outside of the time frame as well as give little indication of the total (process) maturity of the organization. Standard Operating Procedures were deemed too local and too detailed and therefore outside the scope of the assessment.

Instead of having numerous and weak concepts, appropriate way of developing is described as having less but powerful concepts.

With the third meeting lack of the number of questions has appeared for most of the concepts in the model. Necessity of grouping questions according to customer meetings is mentioned also for Processes perspective.

Some measurements included in process are closely related to concepts covered within the cultural perspective. To which perspective these concepts going to be related is discussed in meetings three, four, and five and then after sixth meeting concepts which are belonging to Process perspective are settled.

During sixth meeting every question is read individually and discussed with company and agreed on it except Knowledge and Skills measurements in the Performers concept are indicated as “too similar” and asked to rephrase their levels. Some questions and levels are marked differently to identify early and later meeting questions.

4.4 Business governance maturity

Like the other perspectives, Management perspective is also created in the third meeting. Necessity of the managerial maturity measurement in the customer maturity model is expressed by Person 1 in the third interview.

Further research was conducted about what to have in this perspective to cover expected area and discussed in next meetings. “Change management”, “change reporting”, “change communication” are discussed in third meeting and then they grouped under “change management concept”.

Change management, Strategic Alignment, and Managerial structures and the related Power structures are determined as essential and needed to be added to this perspective.

Models and questions related to “Change Management” and “Knowledge Management” examined with case company in fourth meeting. Lack of the number of questions appeared for most of the concepts in the model.

In Knowledge Management some questions are eliminated because of redundancy and in Change Management some levels for models are rephrased to improve better understanding. The remainder of the questions are analyzed in the sixth meeting. Updated versions of questions about change management and knowledge management are re-checked in sixth interview.

Dilemmas for some concepts -which occurred after literature review- with Culture perspective, are solved in most of the interviews and at the end of sixth meeting they were all settled.

4.5 Culture

Due to the closeness of certain aspects from the maturity models provided for process maturity to the cultural perspective some aspects needs to be broken off from its parent model in order to adhere to the perspectives. Maturity of the business processes which come up from emotional situations are considered to be in another part called cultural maturity. This creates a problem as cultural aspects as well as individual process measurements are considered important for process maturity.

During the fourth interview integrating culture to the model was still problematic for both parties. After performing more research about these areas two ways of modeling were proposed. First one is dividing the culture to three parts in a way which could fit in to IT, business process and managerial perspectives.

In the first meetings cultural aspects needed to be expanded because culture consisted of managerial structures and employee skills and attitudes. Employee skills are divided as “experiences”, “current application skills” and “education level. Nevertheless both the researcher as the company representatives are not satisfied with these concepts and these concepts are saved during the interviews and sub concepts are evaluated to “education” and “skills” and grouped under “Employee Background” concept.

Cultural aspects were realized to be either sensitive to ask, too complex/academic or very hard to measure in a casual way. Culture homogeneity was discussed during meetings but eliminated because of unfeasibility of measuring.

Fifth meeting was done with person 2 and asked which were the most important aspects of customer maturity and what had been left out by our customer maturity model. Feedback is seen to be already covered in the model. But “Risk orientation Concept” determined as not related to Culture perspective but “project management” concept form Management perspective.

All the questions are reexamined one by one during the sixth meeting. Some questions in Organizational Style are fixed during the meeting and feedbacks are taken for further fixes.

5 Analysis

The analytical process for identifying and forming measurements for the CMAT is based on iterations between reviewing literature and collecting feedback from the case company in order to form concepts and measurements. The analysis chapter is structured around the four maturity perspective, the concepts as well as the associated measurements are analyzed within their respective subcategory as defined by the initial literature review.

The analytical work was conducted according to the analytical model described in Figure 2.5.1, based on individual number of iterations between empirical data, literature or both for each concept. The number of iterations were decided by the quality of theoretical support for the concept as well as the richness of feedback concerning the concept from the case company. The final questionnaire related to cultural maturity according to the analysis carried out in this chapter is shown in appendix, Part 2.

5.1 IT

By evaluating the current IS/IT infrastructure in terms of capability and how it's managed a CMAT can potentially identify valuable information to an IS/IT supplier in an early stage of the sales process. Having surveyed the literature with regards to IT maturity Concepts for IT Maturity can be divided into three branches, the IT capabilities of the organization, the IT architecture and the homogeneity of IS/IT related concepts within the organization.

5.1.1 IT capability:

The IT capability analysis model by Broadbent et al.(1999) provides a framework for measuring and evaluating an organization's IT capability. The total capability is based on two separate concepts, the functions that are hosted in the infrastructure as well as the reach and integration of key functions.

Functions: By analyzing the functions that are supported by the infrastructure an indication of how mature the organization is, where an infrastructure supporting more functions is considered more mature. This idea sprung early in the interviews as many IS/IT solutions require certain core capabilities in order to be implemented and used. By measuring the maturity of the available functions allows more informed decisions to be made during the planning and sales activities related to the IS/IT solution. Many of the functions supplied by Broadbent et al. (1999) were however considered to obsolete by the potential users of the CMAT and new functions were designed by the case company representatives to replace the obsolete ones and better measure the capability of the infrastructure.

Apart from the framework supplied by Broadbent et al.(1999) the capability of managing and running master data libraries that constitute the main database of ERP and similar systems was considered a powerful indicator of which capability maturity the infrastructure in the organization has. The master data maturity in the customer organization was considered important enough to break off the general capability measurement and be measured separately in order to enable aggregating only the master data maturity measurements.

The *master data* measurements were designed around ownership, number of connected systems, standardization levels and unification across the enterprise as per recommendation of the case company representative. In addition, a measurement regarding the customer company's ability to host virtualized services were added as per request of the case company as an indicator of capability maturity.

The second part of the IT capability measurement consists of an evaluation of the *reach and range* of the applications and services that the organization hosts. This concept sets out to evaluate how far the enterprise has integrated its services (reach), and how diverse the service structure can be considered (range). The reach and range matrix presented in Broadbent et al.(1999) was included in the CMAT without any modification. Based on the Broadbent et al.'s (1999) scores, the maturity levels were designed to correspond to the following scale:

- A score in the matrix between 0 – 17 corresponds to a level 1 maturity
- A score in the matrix between 18 – 35 corresponds to a level 2 maturity
- A score in the matrix between 36 – 58 corresponds to a level 3 maturity
- A score in the matrix between 59 – 80 corresponds to a level 4 maturity
- A score in the matrix between 81 – 100 corresponds to a level 5 maturity

The levels have been set this way because in Broadbent et al.'s study the mean score found to correspond to 35 points. Lowest scoring firm registered 17 points, and the highest scoring firm registered 80 points. Based on that, the above scale has been chosen to reflect the levels of Reach and Range Maturity.

5.1.2 IT architecture

The original aspects distilled from the model provided in US DoC (2003), which are; Operational Unit Participation, Senior Management Involvement, Architectural Processes, Architectural Governance, Architectural Development, IT security, IT Acquisition and Investment Strategy, Business Linkage, Architectural Communication where evaluated in respect to the provided context of the tool as well as together with the feedback of the case company. Upon this review it was identified that the area of Business linkage is already being covered deeper by the Reach and Range matrix used in the capability section of the IT maturity perspective.

In addition, the Strategic Alignment concept presented in US DoC (2003) is already covered in the Business Governance perspective by measurements provided by Luftman (2000) on both a general level as well as related to IT Alignment. The measurements presented in Luftman (2000) were deemed both more reliable as well as user friendly and the Strategic Alignment concept from US DoC (2003) was therefore removed instead of moved to the Business Governance perspective. This was repeated for the Architectural Communication concept which is covered in the Knowledge Management measurement group in the Business Governance perspective.

During the interviews we focused on the measurements of Architecture Process and Architecture Development which were considered to be too similar to motivate two separate measurements in the form provided in US DoC (2003). Both measurements are

however kept in the model as they were deemed interesting enough on a concept level as indicators of IT architecture maturity.

The original measurements from US DoC (2003) contained six separate maturity levels (0-5) which were reduced to five by merging maturity level zero and one into a single maturity level to simplify the integration of the framework into the CMAT which is mainly based on a five level measurement scale for the concepts.

5.1.3 IS/IT homogeneity

The IS/IT Homogeneity concepts were dropped during the last iterations of the CMAT during the interviews. The concepts were considered interesting but no measurement capable of indicating a clear relationship between homogeneity and maturity was able to be created. The creation of measurements and maturity levels separating an organization with a chaotic and diverse infrastructure from an organization with a deliberate specialized architecture that is heterogeneous could not be achieved with respect to maturity and therefore the IS/IT Homogeneity concept was dropped from the CMAT.

5.2 Process

Business processes and the management of processes are cited as one of the most influencing factors for organizational performance by Fisher (2004), Hammer (2007) and Rosemann (2005). This was confirmed during the interviews where Business Process Reengineering (BPR) and process change management as well as the initial process maturity status was cited as decisive factors regarding the success of implementations or adaptations of IT related services and solutions.

Fisher (2004), Hammer (2007) and Rosemann (2005) all propose similar aspects of process maturity to be of importance for the management of organizational processes. These can be divided between factors that primarily aim at measuring aspects that can be identified for actual processes (Business Process Maturity) and factors that are more general and affects the climate and management of all processes in the organization (Business Process Management Maturity).

5.2.1 Business process maturity

Fisher (2004), Hammer (2007) and Rosemann (2005) all discuss maturity factors related to process maturity. The analysis models provided by the authors contain similar concepts but Hammer (2007) was deemed as the most optimal one to convert into the CMAT format and the concept names used by this model are therefore the basis of the process perspective in the CMAT. The feedback from the interviews regarding including process maturity in the CMAT concluded that although the information can be “good to know”, the effort related to mapping individual processes would be higher than the value of the information. The framework supplied by Hammer (2007) was however indirectly supported by the other authors which justified to include it from an academic perspective. However as per feedback regarding the measurement of individual processes the actual measurements of process maturity were converted to fit both individual processes as well as to be used on a “general” or “average” process in the organization, thus giving an indication of how mature the general process is. All concepts had an extra maturity level added to additionally differentiate between the lower levels of maturity which were considered too narrow as well as to comply with the “standard

fit' of the CMAT which is based on five levels of maturity. The concepts used in the CMAT for process maturity are; *Design, Performers, Owner, Infrastructure and Metrics*

5.2.2 Business process management maturity

Business process management maturity is the term used in the CMAT for the activities, policies and knowledge focusing on creating an environment for processes to improve. An organization that is mature in its business process management will push the processes to constantly improve, rather than restrict them from becoming more capable and mature. As shown earlier in the literature review the authors Fisher (2004), Hammer (2007) and Rosemann (2005) have quite similar models where Hammer (2007) is the one that is best suited for the purpose of the CMAT. In addition to the aspects used by Hammer (2007) the concept *BPMM coverage* was adopted from Rosemann (2005) and included in the CMAT model as Hammer (2007) does not measure the actual level of implementation of BPM through the enterprise. The level of BPMM gives a strong indication of what to expect from the customer organization in terms of complexity in their current processes that can create problem for the IS/IT provider as well as the capability of managing the integration of the IS/IT solution. The measurements *Leadership, Expertise* and *Governance* were all converted to a five level maturity scale from the original 4 that was used by Hammer (2007). The section pertaining to cultural capabilities in Business Process Management were deemed to better correspond to the cultural perspective of the CMAT and therefore transferred and adapted to the cultural perspective of the CMAT to avoid redundancy in the tool.

5.3 Culture

During the interviews and literature review process a number of concepts were identified as important to include in a CMAT either by the case company, the literature or by both. Among these, several concepts had a common denominator of mainly addressing cultural issues and these concepts constitute the cultural perspective in the CMAT. The concepts that were incorporated into the cultural perspective of the CMAT were in turn grouped according to three themes; Organizational attitudes, Change readiness and Employee background. The most common characteristic of the aspects in the cultural perspective of the CMAT is the lack of clear measurements provided by the literature review which can be directly derived from organizational maturity as well as the difficulty of defining unambiguous maturity levels of the concepts.

5.3.1 Organizational attitudes

The Organizational attitudes concept is introduced as a placeholder group name for cultural aspects that has been identified as important to include in a CMAT in order to measure cultural maturity, but not different or important enough to receive its own sub-category. The organizational attitudes concept does not contain any direct measurements as all measurements are delegated to the sub-concepts. The chosen concepts are:

Prioritization process: Prioritization process was mentioned in an interview as a good indicator of how mature the organization is in handling day to day bottlenecks and reacting to unforeseen problems. An organization that prefers and is capable to plan ahead instead of acting shortsighted can be seen as more mature and therefore add to the

concept of cultural maturity. The CMAT measurement of this concept was inspired by Luftman (2000) which provides a similar measurement as part of a framework for evaluating strategic alignment for IT. In the CMAT the measurement is slightly rephrased to better fit with a cultural perspective as well as having the maturity levels slightly changed to be easier to distinguish between level four and five which was considered to be ambiguous and hard to differentiate by the potential users.

Protocol rigidity is mentioned by Luftman (2000) as an indicator of how mature communicational aspects are within the organization. A less formal organizational culture is considered to be easier to work with and in, and is therefore considered more mature. The measurement used in the CMAT is taken from Luftman (2000) but was modified to sound less academic in the tool as per feedback from the interviews.

Understanding of IT by business: During interviews with both company representatives the understanding of IT by business executives and managers was mentioned as one of the most important indicators of how mature the organization would be for purchasing and implementing an IS solution. The reverse relationship, *Understanding of business by IT* was found in an article by Luftman (2000) and is also included in the model.

Teamwork: The attitude towards organized teamwork across organizational borders is in Hammer (2007) used as an indicator of how mature the “enterprise capabilities” of the organization are in terms of supporting business processes. This is however also applicable for indicating mature customer attitudes, where low resistance and willingness to participate in cross functional teamwork is considered to be a mature attitude. Luftman (2000) does also mention high levels of teamwork as a part of mature project management but does not have as explicit definitions as Hammer (2007). In the CMAT the measurement from Hammer (2007) (four levels of maturity) is used with an addition of an extra maturity level to fit in with the other measurements in the organizational attitude cluster of the tool. This concept and measurement was broken off from the process maturity framework supplied by Hammer (2007) and moved to organizational attitudes within the cultural perspective as it was considered too general to only measure process maturity as the measurement targets the overall organizational culture.

Attitudes to IS/IT: The organization’s overall attitude to IS/IT was mentioned in interviews as one strong indicator of general customer maturity for potential customers of the case company. A mature attitude to IT can according to the interviewees be described as pervasive and an organizational culture that has not yet accepted IT as an important leverage can be considered as immature. Attitudes to IS/IT were therefore placed within the organizational attitudes subgroup and measured by the levels used by Luftman (2000) to measure the organizational perception of IS/IT value for the organization.

Customer focus: Hammer (2007) uses customer focus as one of the aspects of having a mature organizational culture that is able to support and nurture high level business processes. Customer focus is considered by the case company as an important aspect of general customer maturity. Due to the generality of the measurement provided by Hammer (2007) it was decided to move the customer focus aspect and measurement to the cultural perspective of the tool, as customer focus is not limited to process management maturity but rather measures an overall organizational attitude. In the CMAT a modified version of the maturity levels proposed by Hammer(2008) is used.

Responsibility: During an interview with the sales representative one aspect of cultural maturity that were discussed were the way the organization handled responsibility and how it can be used as an indicator of cultural maturity. This area of cultural maturity is partly covered by Hammer (2007) in the enterprise capability section of the process maturity model. In the model by Hammer (2007) maturity levels are provided and a modified version is included in the CMAT. These maturity levels matched well with the type of measurement that was asked for by the case company but was converted from a four to a five level maturity measurement to better fit in with the other aspects of organizational attitudes.

5.3.2 Change readiness

The ability to capture cultural elements that affect the organization's ability to accept and go through change was mentioned as one of the absolutely most important tasks of the cultural perspective in the interviews. This view is supported by numerous authors throughout the literature review as change is often closely linked to IS/IT implementation. This subgroup of the cultural perspectives shares many semantic aspects with the organizational attitudes but was made a standalone group to enable independent evaluation and analysis of the change readiness aspect of the organizational culture. The measurements assigned to this concept is a mixture of the change readiness measurements provided by Hammer (2007) as part of the enterprise capabilities as well as questions used for project management maturity by Andersen (2002). The measurements collected from Hammer (2007) were converted to a five level maturity scale to better fit with the other measurements within the cultural perspective.

5.3.3 Employee background and Skills

Another topic frequently mentioned during the interviews was to use the background and skills of the employees of the customer organization to indicate how mature the organization would be. There were however no one-to-one relationship identified between education and maturity of organizations. The education level of the employees are rather an indicator of the type of tasks and activities conducted by the employees rather than the maturity. A mature organization would rather have found the right level of education and skills instead of overeducating, causing maturity levels to be different for each company and therefore hard to measure and quantify. However, according to the representatives of the case company the process of educating and gaining skills that employees go through have generally proven to develop the employees enough to constitute an indicator of maturity. This indicator was however not seen as strong enough to indicate a relationship between customer maturity with employee education and background, and in the end this concept was excluded from the CMAT.

5.4 Business governance:

The business governance perspective contains the identified indicators of maturity that are related to formal control and governance methods as well as the instantiations of the management practices in the organization. The analysis is formulated around 5 main concept groups; Change management, Project management, Knowledge management, Business strategy and Business management

5.4.1 Change management

Powell (2008) argues that incorporating change management into the core organizational competences is a clear sign of a capable and developed organization. By deliberately developing the change management abilities the organization is able to navigate through imposed or purposeful change with a much higher reliability of achieving the projected goals of the change processes. This view of the importance of housing capable change management practices within the organization was shared by the case company which argued for change management to be included in the framework of the CMAT. In the CMAT, change management covers the formal and management oriented activities that deal with the planned, structured or guided aspects of change. This concept was originally part of the change readiness aspect located in the cultural perspective but was moved and made a standalone concept covering the formal and deliberate activities related to organizational change.

The measurements for the change management maturity is formed around the Change Management Maturity Model presented in Prosci (2004). From this framework, critical success factors for Change Management Capability were extracted and validated by the case company as concepts capable of indicating change management maturity. Kemp et al. (2008) argue for the need of managers to manage the implementation climate related to major changes within the IS/IT architecture of the organization. This is covered partly by the framework by Prosci (2004) that is used for measurement of change management as well as by some of the measurements within the “Change readiness” concept group in the cultural perspective of the CMAT. The model provided for analyzing change management maturity by Prosci (2004) contains both prescriptive as well as descriptive elements.

Training: According to the interviews, one of the most important factors in determining the success of a major IS/IT project is 1) how training is conducted within the implementing organization and 2) how much effect the training activities have on the actual users attitudes and skills. The evaluation of training was split between cultural aspects located within the change readiness concept group and the more deliberate and planned aspects were assigned to the change management concept group. Aydin et al. (2005) discuss how to evaluate readiness for e-learning within organizations as well as suggest a framework containing true or false statements to be used for the evaluation. The framework provided was developed especially for organizations in developing countries but were adapted together with the case company to better fit the case company’s requirements and is the sole source of measurements used in the CMAT for the training aspect of change management.

5.4.2 Business management

The Management concept within the business governance is a group name for aspects related to governance and management of the organization but not critical enough according to the literature review and interviews to be measured separately. The concepts included in the business management concept group are; Locus of power, Decision making processes, Management style and Company structure.

Locus of power: Locus of power is a term used for measuring the power distribution in the organization developed in Andersen (2002). The concept was extracted and dis-

cussed during the interviews as an indicator of which type of management structure that the customer is employing. This type of information is according to the interviews as well as by Andersen (2002) an indicator of how adaptive the organizational leadership can act during the implementation project.

Management style: Luftman (2000) provides a five level maturity assessment for evaluating the management style present in an organization. The measurement aims to differentiate between long term relational management activities and more short sighted transactional management. Organizations employing management guidelines and protocols to promote long term relationships are valued as more mature in terms of management style. The measurement used in the CMAT is taken from Luftman (2000).

Company structure: The company structure was mentioned in the interviews as an indicator of the overall organizational maturity. In medium to large organizations the relationship between the CEO and the highest ranking IT manager is a strong indicator of the organizational maturity as a potential IS/IT solution customer. According to the case company representatives, the closer to the CEO the CIO (or equivalent) is positioned in the organizational structure, the more mature the organization is to be considered from an IS/IT customer perspective. A vaguely similar measurement was used, but not explicitly mentioned in Luftman (2000), this measurement was modified and included in the CMAT according to the feedback received from the case company.

5.4.3 Project management

Andersen (2002) and Robertson (n. d.) discuss project management maturity within organizations where they argue that project management should be considered as important as an organizational core competence as change management. Project management is in many cases linked with the change management competency in the organization but is used as a standalone concept in the CMAT due to the clear difference of the final measurements compared to the change management measurements. Andersen (2002) provides several measurements that can be related to project management maturity which were included in the CMAT.

Risk orientation: During the interview with the sales representative the question regarding however risk orientation could be an indicator of a mature organizational culture was discussed. Luftman (2000) uses risk orientation to measure project management maturity in an organization with an emphasis on measuring risk and rewards and how these are distributed within the organization. This measurement was considered theoretical and academic with little real use in practice by the case company in its current state and was therefore dropped from the CMAT.

5.4.4 Knowledge management maturity

Knowledge management in the CMAT addresses the formal and conscious sharing of knowledge and knowledge assets development that is present within the customer organization. Managing the processes related to identifying, transforming and storing knowledge that can be of value for the organization is in this model considered as an indicator of organizational maturity. Kulkarni and Freeze (2004) claim that although many tools and methodologies for measuring knowledge management capabilities are published, very few of them has been tested for validity. The framework for measuring

knowledge management maturity that is provided in Kulkarni and Freeze (2004) provides measurements for evaluating the knowledge management maturity within organizations. The framework, although validated from an academic viewpoint was considered cumbersome to use and overly academic in the phrasing of questions and maturity levels by the potential users in the case company. The framework therefore underwent cosmetic changes to raise the acceptance of potential users while trying to keep the functionality of the framework unchanged.

Business metrics: Business metrics maturity were discussed in interviews as a general indicator of how mature the business governance of the organization is. The measurements of this concept includes a broad range of concepts from definitions of organizational standards for key metrics to budgetary control measurements. Upon further analysis the type of metrics that were considered by the case company to have the most impact from a maturity perspective was the measurement of IT related activities and results. These are measured both from a technical maturity perspective as well as regarding how linked and accepted the IT metrics are in relation to the more common business metrics. Luftman (2000) provides maturity levels for business metrics as a sub-measurement for strategic alignment of IT which fit well with the maturity dimension of the CMAT and were included with minor modifications in the CMAT.

Service level agreements: According to the interviews, service level agreements are a maturity indicator by only its presence within the customer organization. Luftman (2000) includes a single measurement of the service level agreement maturity of organizations which were considered too narrow by the case company and new measurements were developed to better fit with the case company's expectations regarding the measurement of service level agreements maturity. Service level agreements were considered a type of business metric and therefore moved to the knowledge management concept group in the CMAT.

5.4.5 Business strategy:

The business strategy concept is a group name for organizational activities and considerations related to Strategic Planning and Strategic Alignment. These concepts were considered important by the case company due to the ability to act as a potential indicator of the maturity within the strategic development and control of the organization. This view is shared by Luftman (2000) where maturity of activities related to the business strategy development is used to assess the general maturity of strategic alignment within the organization. In the CMAT a modified version of the measurements provided by Luftman (2000) is used for measuring maturity in activities related to both strategic planning as well as strategic alignment.

5.5 Customer Maturity Analysis Model

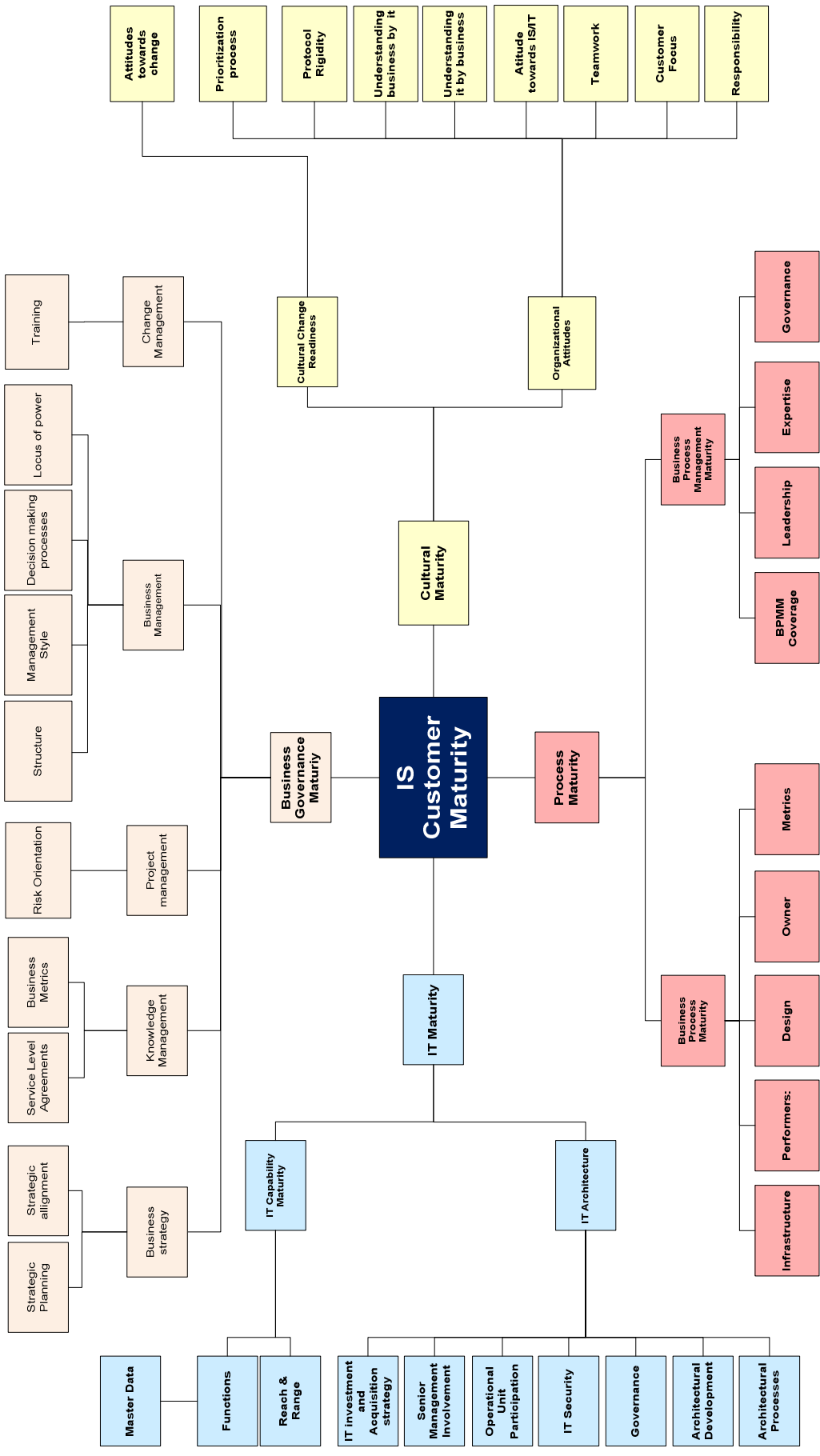


Figure 5.5.1: Displays the Customer Maturity Analysis Model according to the initial analysis of the empirical data

5.6 Customer maturity analysis model structure analysis

During the analytical iterations between theory and empirical data it became clear that the original design of the model which contains four distinct perspectives of customer maturity had some inherent structural weaknesses. The three main weaknesses that were identified during the analysis process were:

- The difficulty of identifying measurements and defining clear maturity levels for culturally related concepts
- The forced separation of already validated models and frameworks in order to adhere to the predefined four perspectives.
- The issue of distinguishing between concepts (and measurements) that primarily describe potency and those that describe maturity, which is not always the same.

Due to these limitations of the concepts and measurements in the CMAT the question wherever the four strict perspectives were the most optimal way of evaluating customer maturity within the IT solution customers' context arose. Upon further analysis, the majority of the issues with the current model composition were linked to the decision of having a separate cultural perspective. Therefore a second alternative of organizing the model was created and evaluated to address the weaknesses associated with the four separate perspectives.

5.6.1 Alternative #1: CMAT based on integrated culture

A CMAT based on a model featuring an integrated cultural perspective solves many of the inherent weaknesses identified in the original organization of the tool, the structure is shown in Figure 5.6.1 and the actual organization of the concepts in the model presented in 5.6.2. This alternative operates on three main axioms:

- Cultural aspects of the organization affect all concepts of maturity, and should not be separated into a separate perspective as culture is pervasive in nature, and must therefore be integrated into the other perspectives.
- In order to receive information that is rich and of high quality in the evaluation of the three remaining perspectives, the cultural aspects relating to IT, Business governance and Processes must be measured together with the non cultural aspects in order to give meaning to the perspectives as a whole.
- The general difficulty of establishing unambiguous measurements and maturity levels for the mainly intangible culturally related concepts and integrate it will not lower substantially the reliability otherwise mainly tangible perspectives.

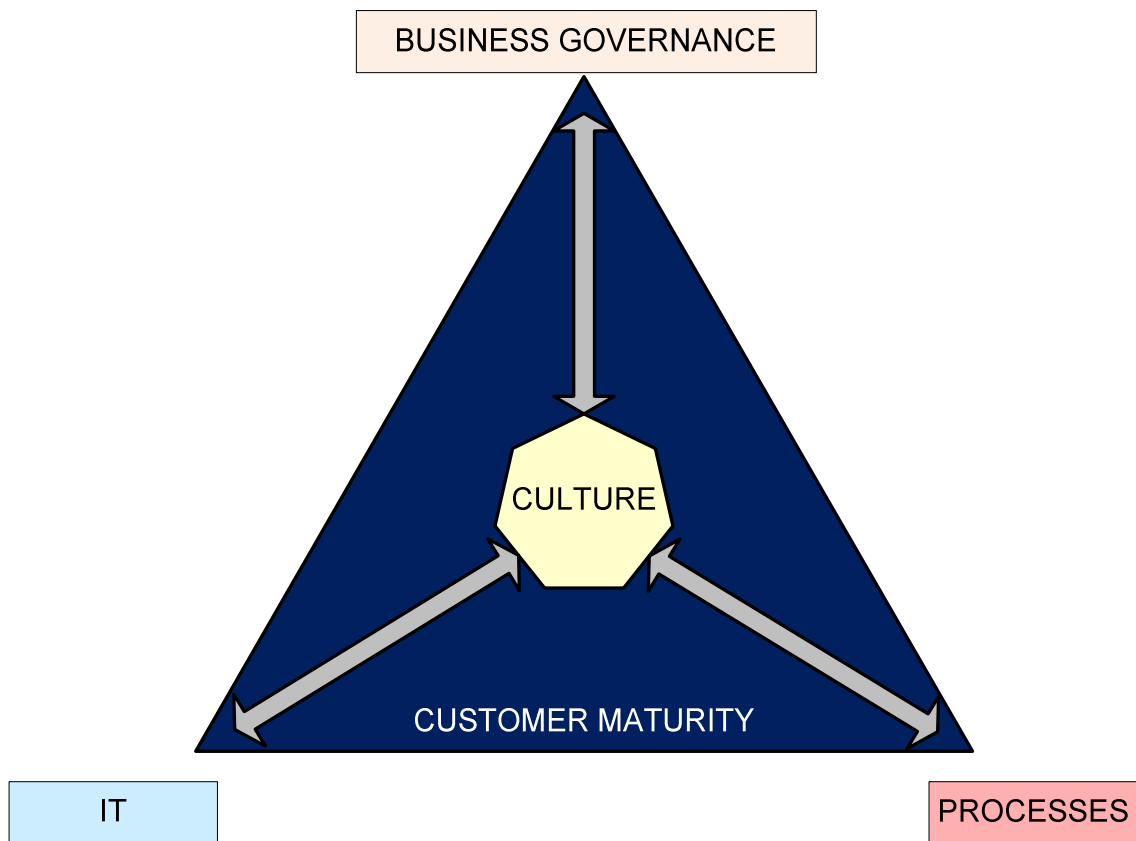
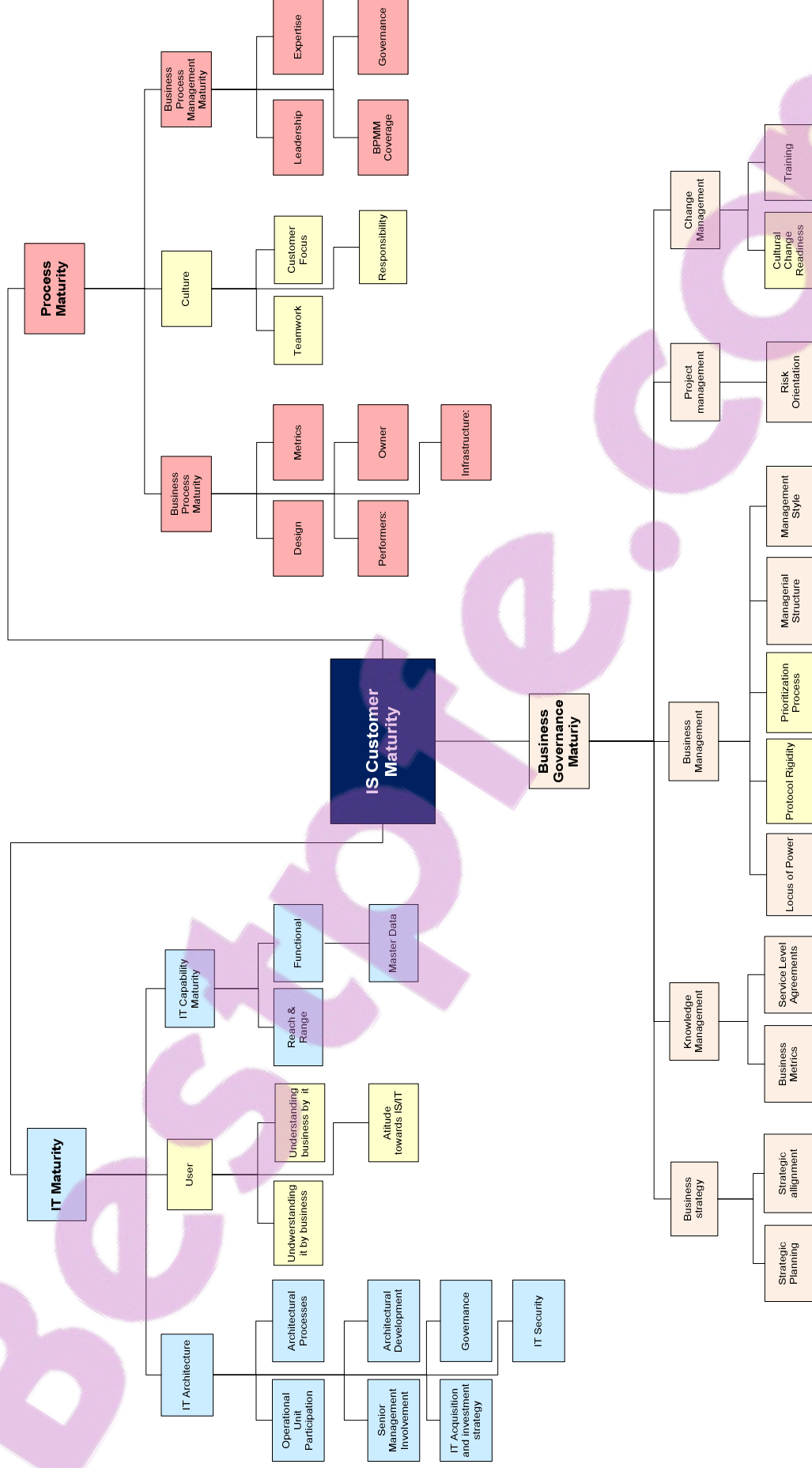


Figure 5.6.1: Shows how culture is related to the other perspectives in the second alternative of the model structure.

By integrating the cultural aspects of the CMAT into the other three perspectives each of the perspectives will be able to give a complete, standalone evaluation of all the identified aspects, tangible and intangible related to IT, Business governance and Process maturity. This will solve the issue with breaking off concepts from previously validated maturity models as well as give a richer total measurement for each of the three remaining perspectives.

5.6.2 Integrated Customer Maturity Analysis Model



5.6.3 Alternative #2: CMAT based on culture as a separate perspective

By organizing the CMAT according to the perspectives used in the initial analytical work the final model will be characterized by three main characteristics:

- The model contains four strict perspectives with very clear themes. All cultural aspects are positioned within the cultural perspective.
- As the cultural concepts from the CMAT are considered to have the worst reliability in terms of measurements and maturity assessments, the cultural aspects kept within cultural perspective. This is done to ensure a higher total reliability of the measurements used for the other three perspectives.
- The IT, Process and Business Governance perspectives will not include cultural aspects and concept groups provided by external assessment models will be separated according to the four distinct perspectives.

During the analytical work it was discovered that many cultural aspects cannot be measured easily in the practical context perceived for the CMAT. This might risk lowering the exactness of the other perspectives if culture related measurements are used for the IT, Process and Management perspectives. Due to the pervasive nature of culture in organizations, the cultural maturity is not easily measured as a separate concept.

The practical restrictions imposed on the CMAT by the case company does not allow data gathering from customers in a detailed enough way to reliably capture pervasive and implicit aspects of the customer organization's culture. By keeping the cultural aspects in the cultural perspective this can be rectified by allowing the user of the CMAT to manually compensate when the environment does not allow implicit information to be captured easily. In the light of these considerations it was decided to give all the four different perspectives an equal weight in the analysis model utilized in the tool but at the same time enable the user to consider the final maturity score to consist of four individual and separate perspectives that not are required to be merged and averaged.

6 Conclusion and Reflections:

This chapter concludes the academic work and presents the deliverable related to the purpose and research question of the thesis. Also a discussion regarding the final shape and contents of the CMAT is conducted. The second part of the chapter covers reflections regarding the use and appropriateness of the theory as well as the research and analysis methods. The chapter ends with the researchers evaluating their own work from the perspectives of the main contributions of the thesis and a recommendation of further research based on the knowledge assets developed by the thesis.

6.1 Conclusions

The purpose of this thesis is to conduct an investigation of concepts related to customer maturity from an IT consultants perspective and evaluate how these concepts can be organized into a tool capable of conducting measurements and assigning maturity levels for the concepts included in the tool. This purpose resulted in the research question:

- Which concepts need to be covered by a CMAT in order to evaluate the pre implementation maturity for potential customers of our case company and how should these be organized and measured?

The result is the Customer Maturity Analysis Tool displayed in Appendix #3. An alternative way of organizing the underlying maturity model in order to compensate for perceived structural weaknesses is shown in chapter 5.6.2. Both models have been based on theory concerning organizational maturity from four different perspectives giving a general foundation which then were adopted to a more specific context through collaboration with the company featured in the case study.

The case company decided to have the final CMAT organized according to the design from alternative #2 featuring culture as a completely separate perspective. The result is a tool validated by the case company that is perceived capable of assessing organizational maturity of current and potential customers from four distinct perspectives.

6.2 Main contributions of this thesis

The research conducted in order to finalize this thesis contributes in terms of academic work in mainly four different ways:

- The thesis presents a multi dimensional literature survey regarding customer maturity to be used in further research as a taxonomy of concepts.
- During the literature review, no other model capable of assessing the complete customer maturity from several distinct perspectives have been found. This implies that the CMAT presented in this thesis is one of the first complete maturity models capable of assessing maturity in an external organization.
- The thesis provides a concept-by-concept analysis of the perceived value and appropriateness of the concepts included in the CMAT from potential users and experts; linking theory and practice with a high degree of detail.

- The CMAT presented in this thesis provides measurements, maturity dimensions and aggregations of aspects identified to be related to customer maturity; either from already established maturity models or based on the analysis of empirical data collected during the research process.

The CMAT together with this thesis contains a complete repository of information regarding the process of forming this version of the CMAT. Due to the scarcity of similar models this thesis represents a reference and a stepping stone for other authors aiming to create their own CMAT.

6.3 Implications and propositions for future research

Much of the reviewed literature regarding customer maturity is based around an internal assessment, with time and resources being substantially larger compared to an assessment performed from an outside perspective. Further research identifying the most significant indicators of customer maturity from an outside perspective could be beneficial for companies interested in developing their own CMAT.

Due to the broad orientation of the thesis additional research focused on expanding, aligning and developing the concepts and their measurements on a more detailed level would be beneficial for the validity of the CMAT.

The CMAT provides a novel perspective on customer maturity which is not validated but rather based on aggregation and abstracting of similar concepts. A more in depth evaluation on alternative organizations of a CMAT would increase the validity of the construct.

6.4 Reflection on choice and quality of theory

The iterative analysis process of selecting and creating measurements for the concepts to be included in the CMAT showed that the theoretical framework proved to conform with the expectations of the case company in terms of forming perspectives establishing concepts. The theoretical framework, however, did not and to a large extent impress the case company regarding the formulation and style of the concept measurements. In many cases the proposed maturity models and measurements within the theoretical framework were considered too abstract and inadequate for usage in “live” situations within the industry by the case company. This was concluded to be a clash of perspectives, where the maturity models primarily was designed for internal use with access to information, resources and time whether the case company expected the tool to function without access to the internal knowledge stored within the customer organization.

The absolute majority of the concepts identified during the literature review were included in the final version of the CMAT, indicating that there is some support in the industry regarding which concepts that should be measured in order to identify customer maturity in organizations presented by researchers. According to the empirical data of this thesis the conflict rather relates to how to design the measurements of the concepts than to which aspects that are important.

6.5 Reflection on practice and analytical work:

Due to the clash of perspectives between the projected resource availability between the internal perspective mostly used in the theory, and the external perspective asked for by the case company many iterations in the analysis were directly related to converting measurements of concepts to an external perspective. The model of analysis used in the thesis was well suited for this type of iterations in order to incorporate both new theory and empirical data into the process and evaluating how to best model the CMAT. The interviews proved to be efficient in both supplying background knowledge as well as evaluating and proposing changes to the iterations of the CMAT. By utilizing a quantitative approach in establishing a link between the concepts identified in the literature review and customer maturity from a number of sources the actual relationship could possibly be verified in a much stronger way than a qualitative one case study is capable of. However, due to the high degree of concepts in the final model that were extracted directly from the literature review and later confirmed by the case company in the empirical data as related to customer maturity we consider the linkage between the used theory and reality to be reasonable strong. This allowed this research project to adopt a qualitative approach in order to explore and develop maturity measurements of the concepts by combining and building upon the already established knowledge from each of the four perspectives used in the model.

6.6 Reflection on the CMAT and conclusion

The final tool delivered to the case company covers all the identified aspects of customer maturity within the requested context. During the analysis the tool has moved from a general format to a specific, tailored to the demands of the case company. The result is a CMAT tailored for this particular company which still holds a strong connection to the theory on a conceptual level.

7 References

Aladwani, A.M. (2001), Change management strategies for successful ERP implementation, *Business Process Management* 7 (3), pp. 266–275.

Al-Mashari, M., (2000). A proposed integrative framework for effective SAP R/3 deployment. In: *Proceedings of GITM'2000*, pp. 39–42.

Broadbent, M., Weill, P and Neo B. S. (1999) "Strategic Context and Patterns of IT Infrastructure Capability," *Journal of Strategic Systems* (8:2), pp. 157-187.

Botta-Genoulaz, V., Millet, P., Grabot, B. (2005) A survey on the recent research literature on ERP systems, *Computers in Industry* 510–522.

Bryman, A., & Bell, E. (2003). *Business research methods*. Oxford, Oxford University Press.

Callaway, E (1999). Enterprise Resource Planning “Integrating applications and business process across the enterprise” *Computer Technology Research Corporation*

De Haes, S. and Van Grembergen, W. (2004) IT Governance and its Mechanisms. *Information Systems Control Journal*,1.

Department of Commerce (2003) , IT Architecture Maturity Model.

Dixon, J.R., Arnold, P., Heineke, J., Kim, J.S. and Mulligan, P., (1994). Business process reengineering: improving in new strategic directions. *Californian Management Review* 36 4, pp. 93–108.

Earl, M. J., and Kuan, B. (1994). "How New is Business Process Redesign?" *European Management Journal* (12:1), 1994 , pp. 20-30.

Earl, M.J. and Kuan, B., (1994). How new is business process redesign?. *European Management Journal* 12 1, pp. 20–30.

Fisher, D.M. (2004). The Business Process Maturity Model. A Practical Approach for Identifying Opportunities for Optimization. [Online]. Available: http://www.bptrends.com/resources_publications.cfm

Ghauri, P.N. and Grønhaug, K. (2005), *Research Methods in Business Studies: A Practical Guide*, 3rd ed., Financial Times Prentice-Hall, London.

Hackos, J. T. (1997). From Theory to Practice: Using the Information Process Maturity Model as a tool for Strategic Planning. *Technical Communication*, (44): 369-381

Hammer, M. (2007) The Process Audit, Harvard Business Review, April, pp. 111-121.

Henderson, J., and Venkatraman, N. (1993). "Strategic Alignment: Leveraging Information Technology for Transforming Organizations," IBM Systems Journal (32:1)

Jarrar Y, Al-Mudimigh A and Zairi M (2000) ERP implementation critical success factors: the role and impact of business process management. Proceedings of the 2000 IEEE International Conference on Management of Innovation and Technology, 12–15 November, Singapore

Johansson, B & Andersen, N-B. (2007) Identifying requirements for future erp systems. Proceedings of the 30th ERP Systems Research Seminar in Scandinavia IRIS 2007)

Keen, P and Cummins, M. (1994) Networks in Action (Wadsworth Press, Belmont, CA)

Keen, P.G.W., (1991). . Shaping the Future: Business Design through Information Technology Harvard Business School Press, Boston, MA.

Kulkarni, U. and Freeze, R (2004), Development and validation of a Knowledge Management Capability assessment model. W. P. Carey School of Business Arizona State University Tempe, AZ USA

Kulkarni, U. and Freeze, R (2005), Measuring Knowledge Management Capabilities W. P. Carey School of Business Arizona State University Tempe, AZ USA

Kwahk K. & Lee J. (2008), "The role of readiness for change in ERP implementation: Theoretical bases and empirical validation", Information & Management, 45(7), 474-481.

Luftman, J., (2000). Assessing Business-IT alignment maturity. Communications of AIS, 4.

Luftman, J., (2003). Competing in the Information Age: Align in the Sand, 2nd Ed., Oxford University Press

M.J. Kemp, G.C. Low. (2008) ERP innovation implementation model incorporating change management. Business Process Management Journal. Bradford: 2008. Vol. 14, Iss. 2; pg. 228

McFarlan W. (1982), Portfolio Approach to Information Systems, Journal of Systems Management, January

McFarlan, F.W. and McKenney, J.L.(1982) "The Information Archipelago-Gaps and Bridges," Harvard Business Review, Volume 60, Number 5, September-October 1982, pp. 109-119.

McKenney, James L. (1995), Waves of Change: Business Evolution through Information Technology, Boston, MA: Harvard Business School Press.

Motsios, T. (1999). 'Implementing ERP systems', Athens University of Economics and Business, Athens

Nah, F-H. (2002), Enterprise Resource Planning Solutions and Management, IRM Press, Hershey

NASCIO Enterprise Architecture Maturity Model, (2003)

Niessink, F. and van Vliet, H. (1998). Towards Mature IT Services. Software Process -- Improvement and Practice, 4(2):55--71.

Pawlowski, S., Boudreau, M-C., and Baskerville, R. (1999). "Constraints and Flexibility§1§1 in Enterprise Systems: A Dialectic of System and Job," In Proceedings of the Fifth Americas Conference on Information Systems. Milwaukee, Wisconsin: 791-793.

Pawlowski, S., Boudreau, M-C., and Baskerville, R. (1999). "Constraints and Flexibility in Enterprise Systems: A Dialectic of System and Job," In Proceedings of the Fifth Americas Conference on Information Systems. Milwaukee, Wisconsin: 791-793.

Prosci's Change Management Toolkit (2004) (<http://www.change-management.com/changemanagement-toolkit.htm>).

Rao, S. (2000), ``Enterprise resource planning: Business needs and technologies'', Industrial

Management & Data Systems, Vol. 1000 No. 2.Redman, T. C. (1998). The impact of poor data quality on the typical enterprise. Communications of the ACM, 41(2), 79-82.

Rob, P. and Coronel, C. (2008).Database Systems, 3rd edition. Boston, MA:

Robertson, Ken. Project Management Maturity Model. Retrieved from http://www.klr.com/white_papers/pdfs/pm_maturity_model.pdf 2010- 05-16

Rosemann, M. & de Bruin, T. (2004). Application of a Holistic Model for Determining BPM Maturity. Proceedings of the AIM Pre-ICIS Workshop on Process Management and Information Systems. Washington, D.C., 12. December 2004, 46-

60. Maturity. Proceedings of the AIM Pre-ICIS Workshop on Process Management and Information Systems 12

Rosemann, M. & de Bruin, T. (2005), Towards a business process management maturity model, , 'Proceedings of the 13th European Conference on Information Systems

Sammon, D. Adam, F. (2010) Project preparedness and the emergence of implementation problems in ERP projects. *Information & Management* 47 1–8 Business Information Systems, University College Cork, Ireland

Sharp, J.A. and Howard, K. (1998) *The Management of a Student Research Project*, Gower.

Stewart, G., M. Milford, et al. (2000). "Organizational Readiness for ERP Implementation." *JOURNAL OF SOFTWARE*, VOL. 5, NO. 5, MAY 2010

Steghuis, C. and Daneva, M. and van Eck. (2005). Correlating Architecture Maturity and Enterprise Systems Usage Maturity to Improve Business/IT Alignment. In: *Proceedings of REBNITA 2005. First International Workshop on Requirements Engineering for Business Need and IT Alignment*, 29-30 Aug 2005, Paris, France. pp. 64-73. University of New South Wales Press.

Sylva, L., Figueroa, E.B., Gonzalez-Reinhart, J.: Interpreting IS alignment: a multiple case study in professional organizations. *Information and Organization* 17(4), 232–265 (2007)

Teece, D. J. (1998a). Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *California Management Review*

Teece, D. J. (1998b). Research directions for knowledge management. *California Management Review*

Yin, R. (2003). *Applications of case study research*. Beverly Hills, CA: Sage Publishing.

8 Appendices

8.1 Appendix 1

An explanation how the points are assigned within the reach and range matrix supplied by Broadbent et al.(1999).

Anyone, Anywhere	2	4	6	8
Customers, suppliers regardless of IT base	2	4	6	8
Customers, suppliers with the same IT base as ours	2	4	6	8
Across different business units abroad	1	2	3	4
Across different business units domestically	1	2	3	4
Across geographically spread single business unit locations	1	2	3	4
Within a single business unit location	1	2	3	4
	Send Messages	Access to Information	Perform Simple Transactions	Perform Complex Transaction on Multiple Applications
Score for Company X:	6	10	15	12

8.2 Appendix 2: Interview protocols

The interview protocols presented here are a transcription of the interview notes taken during the meetings with the case company. The interview protocols are presented in the order which the interviews were held.

First interview 02 February 2010

The first interview was expected to have some short introduction and background of the company and us to show the willingness to do the research. In the first meeting we went to company with two master thesis proposals.

Most of the thesis offerings which related to ERP systems were depending on usability criteria's and user customer group analyses. That's why we prepared one of our proposals about usability criteria's and how to upgrade them.

The purpose of first thesis proposal is to investigate how an information advantage can be obtained by the company by developing user classification and usage patterns. For our thesis purposes one, we are also interested in trying to collect user data on how usability is defined and if it differs between user groups.

Second proposal was about developing a usability assessment model based on different perspectives on IS interaction for example the concepts of; Human Computer Interaction (HCI), Usability theories and the Technology Acceptance Model (TAM). The deliverable of this proposal is a tool capable of assessing one or several parts of an ERP systems usability based on a theory-driven set of criteria.

Feedbacks gathered from the meetings are:

- The key area is customer quality depending on areas mainly
- Learnability profile.
- Change readiness profile.
- ERP maturity profile.

With keeping this in mind the identifying user groups and describing them in terms of needs for enhancement in both implementation and governance to upgrade customer quality.

This research can fit in a way that can work compatible with Microsoft Sure Step ERP implementation methodology.

Second interview 23 February 2010

Second interview was about presenting three different thesis proposals. These proposals developed with the relation of first meeting. Main points of these proposals are;

Proposal #1 -Looking into the MS Sure Step ERP implementation methodology:

- Which tangible/intangible benefits of using the Sure Step methodology can be observed?
- How can the methodology be modified/ adapted to better suit you and your customers needs?
- Can the Sure Step methodology be enhanced by reinforcing weak areas with externally developed tools and procedures?

Proposal #2 -Customer Maturity modeling:

- Aiming to improve the quality of company's ERP implementations by adding customer maturity modeling to the implementation process.
- Which are the organizational maturity factors that historically have affected the end result (customer perspective) and the working process (Interviewee Company perspective)?
- How can this knowledge be of practical use and create value for the company?

Proposal #3 -Hybrid: Customer maturity in MS Sure Step:

- Will modeling of customer maturity add value to the Sure Step methodology?
- How to best integrate maturity modeling in Sure Step?
- Which tangible and intangible benefits can be achieved
- Company's interest was on the second proposal more than the other two but with some modification.

Third interview 17 March 2010

With third meeting both company and we are agreed on the importance of deliverables of the thesis.

Deliverables of the thesis is the model depending on the literature already been developed and feedbacks from practical side of the knowledge and questionnaire which measures the maturity of the customer according to developed model.

Two different versions of the end tool were also discussed; one for “experts” and one for “other” where the first version would be much more extensive.

Necessity of the managerial maturity measurement in the customer maturity model is expressed by Person 1.

Maturity of the business processes which come up from emotional situations are considered to be in another part called cultural maturity

Lack of the number of questions is appeared for most of the concepts in the model.

Necessity of grouping questions according to customer meetings (First meeting / Already acquainted meeting)

Fourth interview 6 April 2010

The fourth interview was about again evaluating the model and questions related to the feedback from Person 1.

Integrating culture to the model was still problematic both for us and company. We had two ways of doing to decide first one is dividing the culture to three parts in a way which could fit in to IT, business process and managerial arrows of the model or another option which is adding ‘the culture’ to the model as a big own arrow.

- Questions are evaluated according to interests of the company.
- Homogeneity of the IT architecture determined unnecessary for the company expectations.
- Lack of questions is appeared in parts which culture included in.

Some of the questions picked as an example questions and be modified by the Person 1 to be the guide for the rest of questions.

Fifth interview 15 April 2010

Fifth interview was done with a different expert. We informed the interviewee before the meeting about what means what in our model, what we tried to express and cover by adding each boxes to the model. We expected to talk about:

Which are the most important aspects of customer maturity and are we missing any boxes in our customer maturity model?

In your experience which aspects related to maturity are the most critical to survey in order to ensure the success of a project?

Feedback taken about mature management types

The dimensions and concepts included are based on a review of current public research related to maturity of organizations. We all agreed on to have four perspectives in the

model are 'IT Architectural Maturity', 'Process Maturity', 'Cultural Maturity' and 'Management Maturity'. Questions which are stated ready were examined in the meeting.

Sixth interview 11 May 2010

This interview was based on evaluating questions according to the maturity and case company expectations. With the support of Person 1 Customer Maturity Analysis Model and Tool is reexamined in the sixth meeting like this ;

Meanings of architectural processes and architectural development according to company perspective are complementary to have. Instead of having two different boxes these two concepts should be merged under one general name.

Knowledge and Skills measurements in the Performers concept are indicated as "too similar" and asked to rephrase their levels.

Culture perspective is agreed to have as a different perspective.

During 6th meeting every question is read individually and discussed with company. Some of the questions for "functions" are determined unnecessary or redundant. Same issue is valid for "IT Investment and Acquisition Strategy" and "Operating unit participation" also. Different type of marking, for the questions are expected by the supervisor to differentiate the "first meeting" and "already acquainted" and also "core idea" questions. As a result of that company expert marked questions as "Un-necessary", "Necessary" and "Star". Some of the Unnecessary ones are eliminated and the rest is rephrased within the meeting. Stared ones are stated as the core idea questions and vital for this section. Redundancy for the questions are also determined for some questions in Knowledge Management .

Change Management some levels for models are rephrased to improve better understanding.

Dilemmas for some concepts -which occurred after literature review- with Culture perspective, are solved in most of the interviews and at the end of sixth meeting they are all settled.

Some questions are marked with stars to differentiate questions for "first" and "second meeting" and also to show the main idea for that concept.

Only minor changes are requested which were corrected and returned by email and , no further meeting is determined necessary to finalize the questionnaire and model.

8.3 Appendix 3 CMAT

Customer Maturity Analysis Tool

Part 1: **IT**

Part 2: **Process**

Part 3: **Culture**

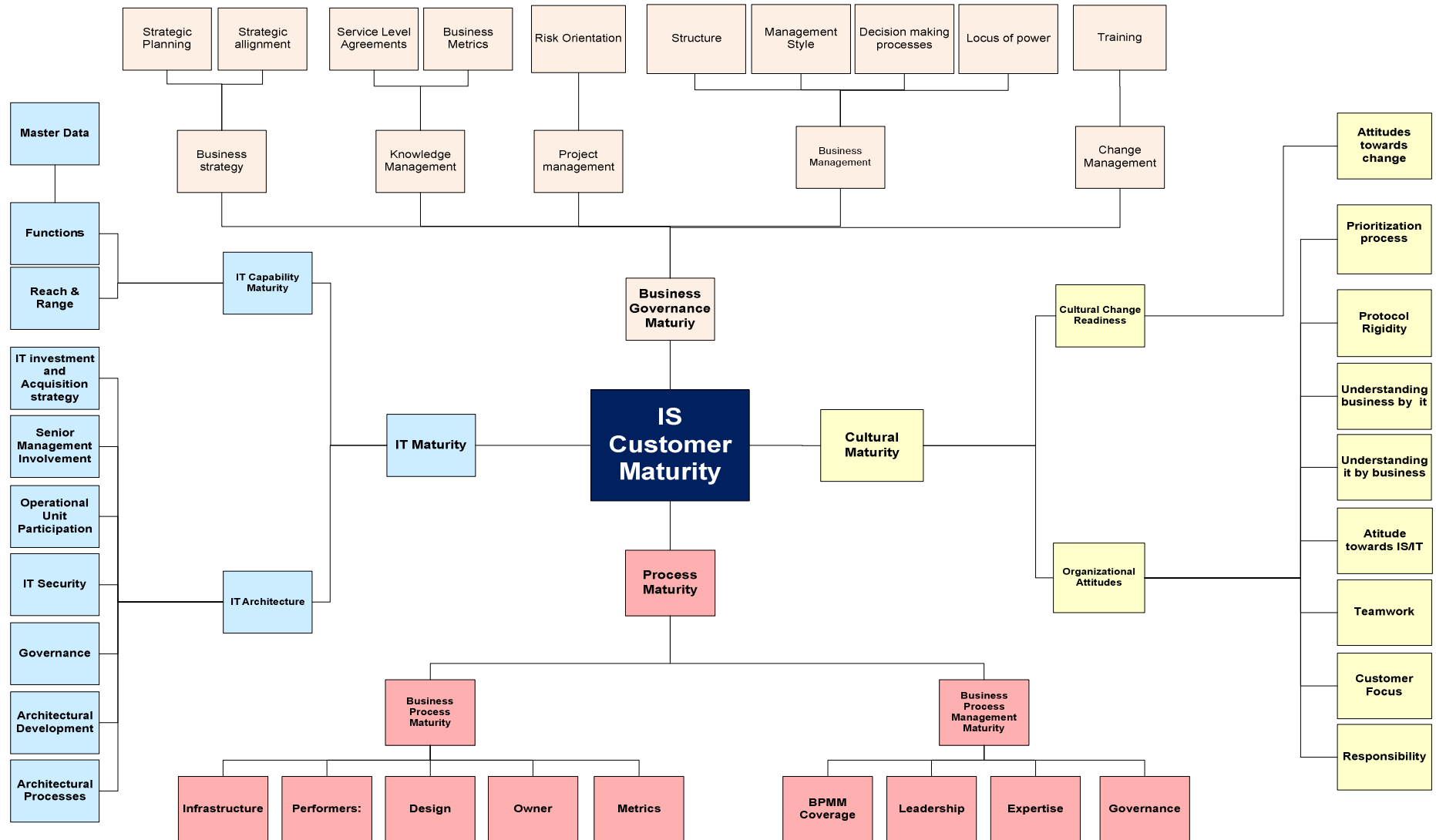
Part 4: **Business**

Governance

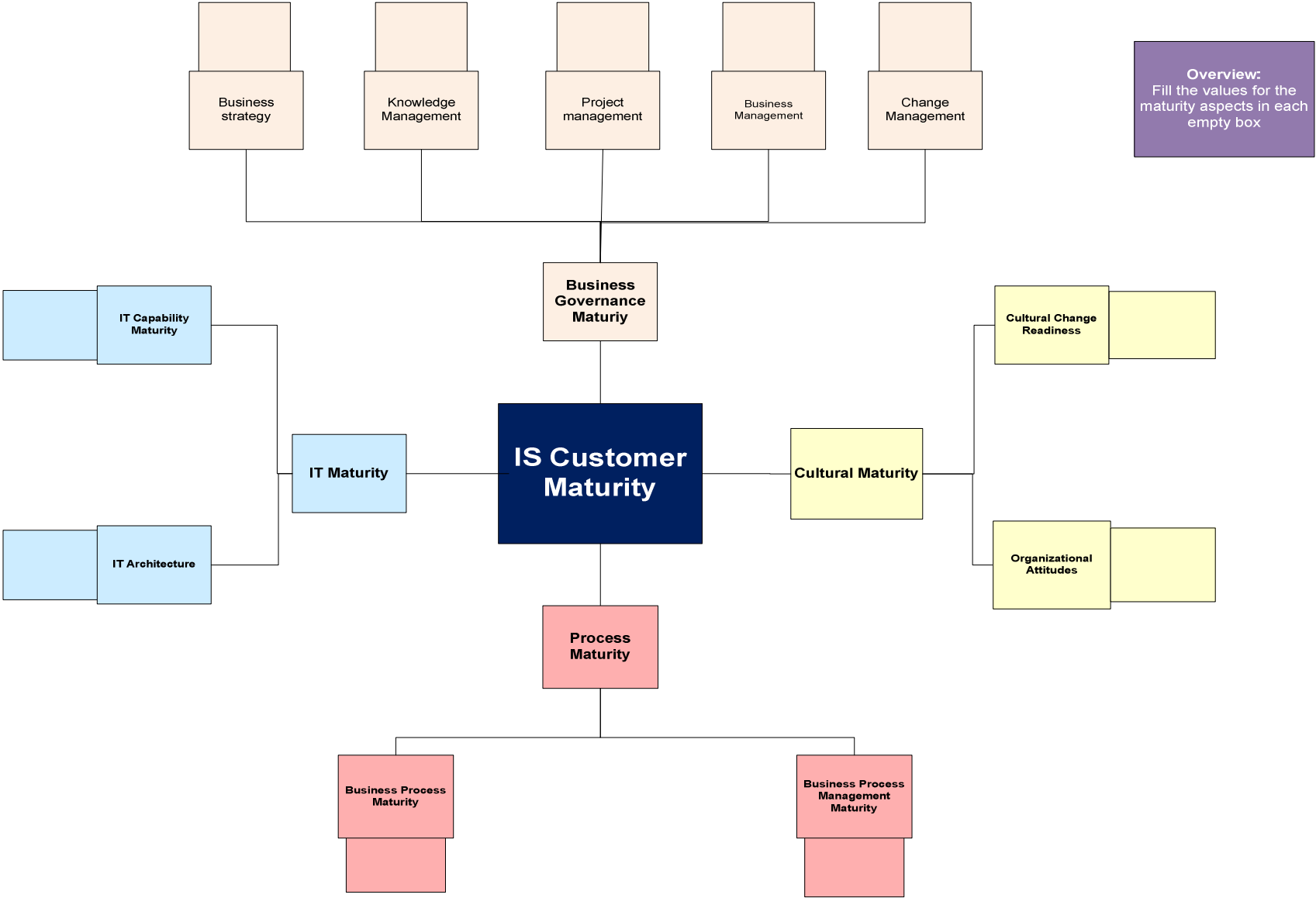
Disclaimer

This tool has been developed based on the extensive survey of literature pertaining to IT and IS Maturity Models. Questions and model levels defined and used in the tool have been adopted, reformulated, extended or used as is in order to create this tool. All original sources have been included in the reference list provided in the document. The authors do not claim original authorship of the metrics provided here. The tool has been synthesized from the literature.

Customer Maturity Analysis Tool Model



Overview



IT MATURITY

I. IT Capability Maturity

I.1.Functions

L1: Please tick the capabilities currently in the organization:	Name of capability				Presence of capability in organization	
	Instant messaging?					
	Virtual private networking?					
	Wireless networking – LAN or WAN?					
	Company can Manage firm-wide communication network services					
	Company can Manage group-wide on firm-wide messaging services					
	Security, disaster planning and business recovery services for firm-wide installations and applications					
	Develop and Implement new security, disaster planning and recovery protocols for business units					
	Perform IS project management					
	Data management advice and consultancy services					
	Perform IS planning for business units.					
	Enforcement of IT architecture and standards					
	Identity and test new technologies for business purposes					
	Develop business-unit specific applications					
	Manage firm-wide or business unit database applications					
	Management of business-unit specific applications					
	Firm-wide or business-unit specific applicants					
	Develop and manage electronic linkages to suppliers or customers					
	Develop a common systems development environment					
Multi-media operations and development (e.g. video-conferencing)						
Capacity to host virtual services						
Number of Applicable Functions	0-4	5-8	9-12	13-16	17-20	
Associated Level:	1	2	3	4	5	

I.2. Master Data

L2: Master Data	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
What characterizes ownership of master data.	No formal ownership is formulated for master data.	Master data is managed by a set number of individuals who unofficially 'own' the data management activities.	Master data ownership is loosely assigned to individuals or organizational units in the organization.	The management and development of master data has a clearly defined ownership structure.	Master data management and ownership is recognized as an important aspect of maintaining the IT infrastructure and enjoys support from higher levels of management in the organization.
How many manual inputs does an organizational wide update of one item in the master data library require in order to be fully implemented (Level of automation).	Five or more	4	3	2	1
What characterizes Standardization of master data.	Master data is not standardized.	Partly standardized within isolated applications.	Master data standardization processes are established and are routinely performed.	Master data standardization is part of tactical and strategic considerations and is formally planned	Master data standardization across the whole organization is recognized as an important aspect of maintaining the IT infrastructure and enjoys support from higher levels of management in the organization.
Master data maturity level result: [(A1 +A2+A3)/3] =					

I.3.Reach and range of IT infrastructure

Reach: ↓				
7.Anyone, Anywhere				
6.Customers, suppliers regardless of IT base				
5.Customers, suppliers with the same IT base as ours				
4.Across different business units abroad				
3.Across different business units domestically				
2.Across geographically spread single business unit locations				
1.Within a single business unit location				
Range of services offered →	1.Send messages	2.Access to information	3.Perform simple transactions	4.Perform complex transactions on multiple applications

Scale:

Anyone, Anywhere	2	4	6	8
Customers, suppliers regardless of IT base	2	4	6	8
Customers, suppliers with the same IT base as ours	2	4	6	8
<i>Across different business units abroad</i>	1	2	3	4
<i>Across different business units domestically</i>	1	2	3	4
<i>Across geographically spread single business unit locations</i>	1	2	3	4
<i>Within a single business unit location</i>	1	2	3	4
	Send Messages	Access to Information	Perform Simple Transactions	Perform Complex Transaction on Multiple Applications
Score for Company X:	6	10	15	12

Levels	1	2	3	4	5
Points	0 – 17	18 – 35	36 – 58	59 – 80	81 – 100
L3 Total					

IT Capability Maturity Overall	
L1: Maturity level of Functions	
L2: Master data management maturity	
L3 :Maturity level of Reach and range	
G1: Maturity level of IT Capability $[(L1+L2+L3)/3]=$	

2. IT Architecture

2.1.IT Investment and Acquisition Strategy

L1: IT INVESTMENT AND ACQUISITION STRATEGY	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
How is IT architecture investments and acquisitions managed in the organization?	Strategic IT acquisitions and investments are not considered in the organization. / Little involvement of strategic planning and acquisition personnel in enterprise architecture processes.	Little or no formal governance of IT Investment and Acquisition Strategy.	IT acquisition strategy exists and includes compliance measures to IT Enterprise Architecture. RFQ, RFI and RFP content is influenced by the IT Architecture. Acquisition personnel are actively involved in IT Architecture governance structure. Cost-benefits are considered in identifying projects.	All planned IT acquisitions are guided and governed by the IT Architecture. RFI and RFP evaluations are integrated into the IT Architecture planning activities.	Operating Unit has no unplanned IT investment or acquisition activity.
Which is the general maturity of IT planning activities in the organization?	No formal IS/IT strategic planning present in the organization./ Ad-hoc and reactive	Functional tactical planning of IS/IT development.	Focused planning on the functional level, some inter-organizational activities present in the organization.	Managed across the enterprise and aligned with the business strategy	Integrated across and outside the enterprise
How is IT investment planning and management characterized in the organization?	No formal assessment or planning methods	Cost based; Operations and maintenance focused	Traditional; Process enabler	Cost effectiveness; Process driver	Business value; Extended to business partners
IT investment and acquisition strategy maturity level [(A1 +A2+A3)/3] =					

2.2.Senior Management Involvement

L2: SENIOR MANAGEMENT INVOLVEMENT	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
Which level of Senior Management Involvement in IT architecture development characterizes the organization	Not available / What is Architecture? Why do we need it? Limited management team awareness or involvement in the architecture process.	Management awareness of Architecture effort. Much nodding of heads. Occasional/selective management team involvement in the architecture process with various degrees of commitment/resistance.	Senior-management team aware of and supportive of the enterprise-wide architecture process. Management actively supports architectural standards.	Senior management reviews architecture and variances.	Senior-management team directly involved in the optimization of the enterprise-wide architecture development process and governance.
IT architecture sponsorship from managers	No formal support/ Limited at the functional organization from a local perspective.	At the functional organization, integrated across functions.	Present at the HQ level	Present at the CEO level	At the CEO level (driving)
Senior management involvement maturity level $[(A1 + A2)/2] =$					

2.3.Operating Unit Participation

L3: OPERATIONAL UNIT PARTICIPATION	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
Which level of Operating Unit Participation characterizes the planning and development of IT architecture within the organization.	No part of Operating Unit participates or is involved with IT Architecture process./ Limited Operating Unit acceptance of the IT Architecture process. "We support the architecture process as long as it represents the standards we have already chosen."	IT Architecture responsibilities are assigned and work is underway. There is a clear understanding of where the organizations architecture is at present time. Recognition that it is painful supporting too many kinds of technologies. Perhaps tired of distributing And not fully-developed or tested applications to Operating Unit IT operations and support.	Most elements of Operating Unit show acceptance of or are actively participate in the IT Architecture process. Recognition that architectural standards can reduce integration complexity and enhance overall ability to Operating Unit IT to achieve business goals.	The entire Operating Unit accepts and actively participates in the IT Architecture process.	Feedback on architecture process from all Operating Unit elements is used to drive architecture process improvements.
Operational unit participation maturity level					

2.4.IT Security

L4: IT SECURITY	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
Which role do IT security considerations play in the IT architecture development?	No IT Security considerations in IT Architecture./IT Security considerations are ad hoc and localized.	IT Security Architecture has defined clear roles and responsibilities.	IT Security Architecture Standards Profile is fully developed and is integrated with IT Architecture.	Performance metrics associated with IT Security Architecture are captured.	Feedback from IT Security Architecture metrics are used to drive architecture process improvements
Do you have an employee IT security awareness training program	No employee IT security training program implemented./Employee IT security training is conducted on ad hoc basis.	Employee IT security training program is being formalized.	Employee IT security training program fully developed and implemented.	Employee IT security training program is monitored and part of employee performance metrics.	Employee IT security training program is Constantly revised and up to date.
Total, IT SECURITY maturity level [(A1+A2)/2]=					

2.5.Governance

L5: GOVERNANCE	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
How is management of architectural standards performed?	No standards. Everyone does their own thing. / No explicit governance of architectural standards. Limited agreement with governance structure.	Governance of a few architectural standards (e. g. desktops, database management systems) and some adherence to existing standards profile. Variances may go undetected in the design and implementation phases. Various degrees of understanding of the proposed governance structure.	Explicit documented governance of majority IT investments. Formal processes for managing variances. Senior management team is supportive of enterprise-wide architecture standards and subsequent required compliance.	Explicit governance of all IT investments. Formal processes for managing variances feed back into IT Architecture. Senior-management team takes ownership of enterprise-wide architecture standards and governance structure.	Explicit governance of all IT investments. A standards and waivers process is used to improve architecture development and governance - process improvements.
How is the architectural standards program run in the organization?	No official program / Ad-hoc, standards updated irregularly from local initiatives.	Standards defined but not adhered to or continuously managed.	Standards adhered to and formally managed.	Architectural standards evolving with the business and supported from a functional perspective	Continuous improvement and alignment of architectural standards is part of the organizational strategy.
Total, Governance maturity level [(A1+A2)/2]=					

2.6. Architecture Process

L7: ARCHITECTURAL PROCESSES	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
Which maturity level characterizes the organizations architecture development process	Not established or does not exist. / Exists in ad-hoc or localized form or early draft form may exist. Some IT Architecture processes are defined. There is no unified architecture process across technologies or business processes. Success depends on individual efforts.	Being actively developed. Basic IT Architecture Process program is documented based on OMB Circular A-130 and Department of Commerce IT Architecture Guidance. The architecture process has developed clear roles and responsibilities.	The architecture is well defined and communicated to IT staff and business management with Operating Unit IT responsibilities. The process is largely followed.	IT Architecture process is part of the culture, with strong linkages to other core IT and business processes. Quality metrics associated with the architecture process are captured. These metrics include the cycle times necessary to generate IT Architecture revisions, technical environment stability, and time to implement a new or upgraded application or system.	Concerted efforts to optimize and continuously improve architecture process.
Architecture process maturity level					

2.7. Architecture Development

L6: ARCHITECTURE DEVELOPMENT	1 Absent or Ad hoc	2 Under Development	3 Defined	4 Managed	5 Optimized
How formal and documented is the organizations process for developing IT architecture.	No IT Architecture documentation to speak of. / IT Architecture processes, documentation and standards are established by a variety of ad hoc means and are localized or informal.	IT Vision, Principles, Business Linkages, Baseline, and Target Architecture are identified. Architecture standards exist, but not necessarily linked to Target Architecture. Technical Reference Model and Standards Profile framework established.	Gap Analysis and Migration Plan are completed. Architecture standards linked to Business Drivers via Best Practices, IT Principles and Target architecture. Fully developed Technical Reference Model and Standards Profile. The architecture aligns with the DoC and Federal Enterprise Architectures.	IT Architecture documentation is updated on a regular cycle to reflect the updated IT Architecture. Business, Information, Application and Technical Architectures defined by appropriate de-jure and de-facto standards. The architecture continues alignment with the DoC and Federal Enterprise Architectures. An automated tool is used to improve the usability of the architecture.	Defined and documented IT Architecture metrics are used to drive continuous process improvements. A standards and waivers process is used to improve architecture development process improvements.
Architecture development maturity level					

IT Architecture Maturity Overall	
L1: Maturity level of IT acquisition and investment strategy	
L2: Maturity level of Senior management	
L3: Operating unit	
L4: IT Security	
L5: Governance	
L6: Architecture Development	
L7: Architecture Process	
G2: Maturity level of IT Architecture $[(L1+L2+L3+L4+L5+L6+L7)/7]=$	

IT MATURITY OVERALL	
G1: IT Capability Maturity Level	
G2: Overall Architectural Maturity Level	
IT: Overall IT Maturity Level $[(G1+G2)/2]$	

PROCESS MATURITY

I. Business Process Maturity

I.1.Design

L1: DESIGN	Level 1	Level 2	Level 3	Level 4	Level 5
Purpose	Processes have not been designed with a clear purpose in mind.	Processes have been designed with a purpose in mind, but not on an end-to-end basis.	Processes have been redesigned from an organizational end to end basis in order to optimize their performance.	Processes have been designed to fit with other enterprise processes and with the enterprise's IT systems in order to optimize the enterprise's performance.	Processes has been designed to fit with customer and supplier processes in order to optimize inter-enterprise performance
Context	Processes do not have the inputs, outputs, suppliers and customers defined.	Processes inputs, outputs, suppliers, and customers have been identified.	The needs of the processes' customers are known and Agreed upon.	The processes' owner and the owners of the other processes with which the process interfaces have established mutual performance expectations	The processes' owner and the owners of customer and supplier processes with which the process interfaces have established mutual performance expectations.
Documentation	The processes are not documented in a systematic way	The documentation of the processes is primarily functional, but it identifies the inter-connections among the organizations involved in executing the processes.	There is end-to-end documentation of the processes design.	The processes documentation describe the processes' interfaces with, and expectations of, other processes and links the process to the enterprise's system and data architecture.	An electronic representation of the processes' design supports their performance and management and allows analysis of environmental changes and process reconfigurations.
Total Design maturity [(A1+A2+A3)/3]=					

I.2.Performers

L2: PERFORMERS	Level 1	Level 2	Level 3	Level 4	Level 5
Process Knowledge	Performers are aware of the functional tasks associated with the process	Performers can name the process they execute and identify the key metrics of its performance.	Performers can describe the process's overall flow; how their work affects customers, other employees in process, and the process's performance; and the required and actual performance levels.	Performers are familiar both with fundamental business concepts and with the drivers of enterprise performance and can describe how their work affects other processes and the enterprise's performance	Performers are familiar with the enterprise's industry and its trends and can describe how their work affects inter-enterprise performance.
General skills	Performers have only basic skills related to their core processes.	Performers are skilled in problem solving and process improvement techniques.	Performers are skilled in teamwork and self-management.	Performers are skilled at business decision making.	Performers are skilled at change management and change implementation.

Behavior	Performers are loyal to their functional department and not the process.	Performers have some allegiance to the process, but owe primary allegiance to their function.	Performers try to follow the process design, perform it correctly, and work in ways that will enable other people who execute the process to do their work effectively.	Performers strive to ensure that the process delivers the results needed to achieve the enterprise's goals.	Performers look for signs that the process should Change , and they propose improvements.
Total Performers maturity [(A1+A2+A3)/3]=					

I.3.Owner

L3: OWNER	Level 1	Level 2	Level 3	Level 4	Level 5
Identity	Process ownership is not used as a formal way of managing responsibility for processes.	The process owner is an individual or a group informally charged with improving the process's performance.	Enterprise leadership has created an official process owner role and has filled the position with a senior manager who has clout and credibility.	The process comes first for the owner in terms of time allocation, mind share, and personal goals.	The process owner is a member of the enterprise's senior most decision-making body.
Activities	No formal process owner exists to perform or assume responsibility for activity modeling of the process.	The process owner identifies and documents the process, communicates it to all the performers, and sponsors small-scale change projects.	The process owner articulates the process's performance goals and a vision of its future; sponsors redesign and improvement efforts; plans their implementation; and ensures compliance with the process design.	The process owner works with other process owners to integrate processes to achieve the enterprise's goals.	The process owner develops a rolling strategic plan for the process, participates in enterprise-level strategic planning, and collaborates with his or her counterparts working for customers and suppliers to sponsor inter-enterprise process-redesign initiatives.
Authority	The formal or informal process owner holds little or no authority over the functions the process interfaces with.	The process owner lobbies for the process but can only encourage functional managers to make changes.	The process owner can convene a process redesign team and implement the new design and has some control over the technology budget for the process	The process owner controls the IT systems that support the process and any projects that change the process and has some influence over personnel assignments and evaluations as well as the process's budget	The process owner controls the process's budget and exerts strong influence over personnel assignments and evaluations.
Total Owner maturity [(A1+A2+A3)/3]=					

I.4.Infrastructure

L4:INFRASTRUCTURE	Level 1	Level 2	Level 3	Level 4	Level 5
Information Systems	Processes are not directly supported by IT	Fragmented legacy IT systems support the process.	An IT system constructed from functional components supports the process.	An integrated IT system, designed with the process in mind and adhering to enterprise standards, supports the process.	An IT system with a modular architecture that adheres to industry standards for inter-enterprise communication supports the process

Human Resource Systems	Processes are loosely coupled with human resource activities	Functional managers reward the attainment of functional excellence and the resolution of functional problems in a process context.	The process's design drives role definitions, job descriptions, and competency profiles. Job training is based on process documentation.	Hiring, development, reward, and recognition systems emphasize the process's needs and results and balance them against the enterprise's needs.	Hiring, development, reward, and recognition systems reinforce the importance of intra- and inter-enterprise collaboration, personal learning, and organizational change
Total Infrastructure maturity [(A1+A2+A3)/3]=					

I.5.Metrics

L5: METRICS	Level 1	Level 2	Level 3	Level 4	Level 5
Definition	Focus lies on measuring activities, not processes.	The process has some basic cost and quality metrics.	The process has end-to-end process metrics derived from customer requirements	The process's metrics as well as cross-process metrics have been derived from the enterprise's strategic goals.	The process's metrics have been derived from inter-enterprise goals.
Uses	Process metrics are used mostly for short term operational process control.	Managers use the process's metrics to track its performance, identify root causes of faulty performance, and drive functional improvements.	Managers use the process's metrics to compare its performance to benchmarks, best-in-class performance, and customer needs and to set performance targets.	Managers present the metrics to process performers for awareness and motivation. They use dashboards based on the metrics for day-to-day management of the process.	Managers regularly review and refresh the process's metrics and targets and use them in strategic
Total Metrics maturity [(A1+A2)/2]=					

G1:Business Process Maturity Overall	
L1:Design	
L2:Performers	
L3:Owner	
L4:Infrastructure	
L5:Metrics	
Maturity level of IT Architecture [(L1+ L2+L3+L4+L5)/5]=	

2. Process Management

2.1. Leadership

L1 LEADERSHIP	Level 1	Level 2	Level 3	Level 4	Level 5
Process Awareness	Processes are not perceived as a important component for organizational improvement by senior executives.	The enterprise's senior executive team recognizes the need to improve operational performance but has only a limited understanding of the power of business processes.	At least one senior executive deeply understands the business process concept, how the enterprise can use it to improve performance, and what is involved in implementing it.	The senior executive team views the enterprise in process terms and has developed a vision of the enterprise and its processes	The senior executive team sees its own work in process terms and perceives process management not as a project but as a way of managing the business.
Alignment	The organization lacks any formal process program	The leadership of the process program lies in the middle management ranks.	A senior executive has taken leadership of, and responsibility for, the process program.	There is strong alignment in the senior executive team regarding the process program. There is also a network of people throughout the enterprise helping to promote process efforts.	People throughout the enterprise exhibit enthusiasm for process management and play leadership roles in process efforts.
Behavior	Process management activities are mainly conceived through "bottom up" initiatives in the middle management level.	A senior executive endorses and invests in operational improvement.	A senior executive has publicly set stretch performance goals in customer terms and is prepared to commit resources, make deep changes, and remove roadblocks in order to achieve those goals.	Senior executives operate as a team, manage the enterprise through its processes, and are actively engaged in the process program.	The members of the senior executive team perform their own work as processes, center strategic planning on processes, and develop new business opportunities based on high-performance processes.
Style	The main form of organizational leadership can be described as top-down and authorial	The senior executive team has started shifting from a top-down, hierarchical style to an open, collaborative style.	The senior executive team leading the process program is passionate about the need to change and about process as the key tool for change.	The senior executive team has delegated control and authority to process owners and process performers.	The senior executive team exercises leadership through vision and influence rather than command and control.
Total Leadership maturity [(A1+A2+A3+A4)/4]=					

2.2. Expertise

L2 EXPERTISE	Level 1	Level 2	Level 3	Level 4	Level 5
People	There are little support or knowledge about how to structure and manage the organization through processes	A small group of people has a deep appreciation for the power of processes.	A cadre of experts has skills in process redesign and implementation, project management, communications, and change management.	A cadre of experts has skills in large-scale change management and enterprise transformation.	Process management and redesign have become core competencies and are embedded in a formal system that includes environment scanning, change planning, implementation, and process-centered innovation.

Methodology	Processes are conceived and managed through unstructured or ad-hoc methods	The enterprise uses one or more methodologies for solving execution problems and making incremental process improvements.	Process redesign teams have access to a basic methodology for process redesign.	The enterprise has developed and standardized a formal process for process redesign and has integrated it with a standard process for process improvement.	The enterprise has extended its process model to connect with those of customers and suppliers. It also uses the model in strategy development
Total Expertise maturity [(A1+A2)/2]=					

2.3.Governance

L3 GOVERNANCE	Level 1	Level 2	Level 3	Level 4	Level 5
Process Model	The enterprise has not structured its activities in process chains.	The enterprise has identified some business processes.	The enterprise has developed a complete enterprise process model, and the senior executive team has accepted it.	The enterprise process model has been communicated throughout the enterprise, is used to drive project prioritization, and is linked to enterprise-level technologies and data architectures.	The enterprise has extended its process model to connect with those of customers and suppliers. It also uses the model in strategy development.
Accountability	Accountability is primarily defined for individual activities or procedures	Functional managers are responsible for performance, project managers for improvement projects.	Process owners have accountability for individual processes, and a steering committee is responsible for the enterprise's overall progress with processes.	Process owners share accountability for the enterprise's performance.	A process council operates as the senior most management body; performers share accountability for enterprise performance; and the enterprise has established steering committees with customers and suppliers to drive inter-enterprise process change.
Integration	Integration between processes and departments is done ad hoc and through individual initiatives	One or more groups advocate and support possibly distinct operational improvement techniques.	An informal coordinating body provides needed program management while a steering committee allocates resources for process redesign projects.	A formal program management office, headed by a chief process officer, coordinates and integrates all process projects, and a process council manages inter-process integration issues. The enterprise manages and deploys all process improvement techniques and tools in an integrated manner.	Process owners work with their counterparts in customer and supplier enterprises to drive inter-enterprise process integration.
Total Governance maturity [(A1+A2+A3)/3]=					

2.4. Business Process Management Coverage

L4 BPM COVERAGE	Level 1	Level 2	Level 3	Level 4	Level 5
Process management coverage	No formal process management method exists within the organization.	Formal process management is conducted irregularly and typically for the high profile core processes.	Formal process management is part of the organizations standard way of governing most major processes.	Process management is standardized and performed for most of the organizations processes.	Process management is routinely conducted for all relevant processes in the organization.
Total BPM Coverage maturity					

G2: Process Management Maturity Overall

L1: Leadership

L2: Expertise

L3: Governance

L4: Business Process Management Coverage

Maturity level of Process Management Maturity $[(L1+L2+L3+L4)/4]=$

PROCESS MATURITY OVERALL

G1: Business Process Maturity Overall

G2: Process Management Maturity Overall

P: OVERALL PROCESS MATURITY LEVEL $[(G1+G2)/2]=$

CULTURAL MATURITY

I. Change Readiness

Set #1:

L1 CHANGE READINESS	Level 1	Level 2	Level 3	Level 4	Level 5
How is Innovation and entrepreneurship viewed upon within the organization?	Risk taking is generally discouraged for non project or management personnel.	Dependent on support from leadership within the functional organization	The organization is generally risk tolerant and allows some levels of experimentation	Enterprise, partners, and IT managers accept and encourages innovations within the firm.	The norm
Resistance to change	Employees react to change with surprise; resistance can be widespread.	Change management is typically used in response to a negative event.	Training and tools become available to project leaders and team members; managers are provided with training and tools to coach front-line employees in future changes	Resistance and non-compliance is expected in isolated instances. Some project teams still do not understand why they are using change management. Adoption is not yet at 100% and the organization is in the process of building change management skills throughout the organization.	Higher ROI, lower productivity loss and less employee resistance associated with change is the result of the high levels of change acceptance within the organization.
Total Change Readiness "SET1" Maturity $[(A1+A2+A3)/3]=$					

Set #2:

L2 CHANGE READINESS	1 = This does not fit the organization,	2 = Low level of fit for the organization	3 = Moderate fit for the organization	4 = This fits most of the organization	5 = Strong level of fit throughout the organization
All project participants are positive towards the demands their projects may place on them.					
The organization has a positive attitude to developing steadily better internal project management competence.					
There is a positive attitude to the well-planning of all sides of project work, both technical and human.					
There is a positive attitude in the organization to the benefits of working across disciplinary borders when running projects.					
The organization puts a lot of effort into combining technical projects with projects that enhance organizational development and competence building for individuals.					

There is a positive will to attach organizational challenges through the use of simultaneous or successive projects.					
There is a great will amongst managers to avoid bureaucratic structures in executing project programs.					
Project managers and sub-project managers are not occupied by “territorial” fights, but concerned with working across projects and support other projects when appropriate.					
There is willingness in the organization to create a project portfolio that include both high-risk and low-risk projects.					
There is willingness in the organization to involve all staff in the development of new project ideas.					
There is willingness in organization to involve all competent staff in the creation of both “hard” (technical) and “soft” (organizational development or HRM) projects.					
There is willingness in the organization to create a project portfolio with projects across functional disciplines.					
There is a mutual understanding that own organizations often can achieve even better goals and missions through establishing good project programs, i.e. combinations of projects that depend and support each other.					
There is a good understanding of the benefits of having functional line work and project work integrated in order to better achieve intentions behind larger R&D efforts.					
Total Change Readiness “Set 2” maturity [(A1+A2...+A13+A14)/14]=					

I.1.Attitude Towards Change

L3 ATTITUDES TOWARDS CHANGE	Level 1	Level 2	Level 3	Level 4	Level 5
Attitudes Towards Change	Change is normally met with hard resistance.	There is growing acceptance in the enterprise about the need to make modest change.	Employees are prepared for significant change in how work is performed.	Employees are ready for major multidimensional change.	Change is part of the organizational core culture and is considered to be an important aspect of the organizations competitive advantage.
Attitude Towards Change Maturity					

Change Readiness	
L1:Set 1	
L2:Set 2	
L3:Attitude Towards Change	
G1: Maturity level of Change Readiness [(L1+ L2+L3)/3]=	

2. Organizational Attitudes

Organizational Attitudes	Level 1	Level 2	Level 3	Level 4	Level 5
Protocol and formal rigidity within the organization	Mainly command and control style	Limited relaxed	Emerging relaxed	Relaxed, informal	Informal
Understanding of IT by business	Business management not aware of IT capabilities and restrictions.	Limited business awareness.	Emerging business awareness.	Business aware of potential.	Closely linked with each other (Pervasive).
Understanding of business by IT	IT management not aware of business requirements	Limited IT awareness of business requirements and restrictions	Senior and mid-management emerging aware of business requirements	Pushed down through the organization on the IT personnel	Closely linked with each other (Pervasive)
Business perception of IT value (Attitude towards IT)	IT perceived as a cost of business	IT emerging as an asset capable of leveraging business processes	IT is seen as an asset in obtaining competitive advantages	IT is part of the business strategy	IT and business are co-adaptive
Role of IT (Attitude towards IT)	Traditional (e.g., accounting, email)	Transaction enabler	Business process enabler	Business process driver	Business strategy driver/enabler
Prioritization process	Mainly reactive and unstructured	Occasional responsive due to minor planning	Mostly responsive due to forecasts and planning	Long term value adding focus guides prioritization decisions	Value added, external partner focus
Teamwork	Formal teamwork is not a part of the organizations work practices.	Teamwork is project focused, occasional, and atypical.	The enterprise commonly uses cross-functional project teams for improvement efforts.	Teamwork is the norm among process performers and is commonplace among managers.	Teamwork with customers and suppliers is commonplace.

Customer Focus	There exists no formal or official plan for focusing on the organizations customers' needs.	There is a widespread belief that customer focus is important , but there is limited appreciation of what that means. There is also uncertainty and conflict about how to meet customers' needs.	Employees realize that the purpose of their work is to deliver extraordinary customer value.	Employees understand that customers demand uniform excellence and a seamless experience.	Employees focus on collaborating with trading partners to meet the needs of final customers.
Responsibility	Responsibilities are undefined and unstructured.	Accountability for results rests with managers.	Frontline personnel begin to take ownership of results	Employees feel accountable for enterprise results.	Employees feel a sense of mission in serving customers and achieving ever-better performance.
G2: Maturity level of organizational attitudes [(L1+... +L9)/9]=					

CULTURAL MATURITY OVERALL	
G1:Change Readiness	
G2: Organizational Attitudes	
C:Overall Process Maturity Level [(G1+G2)/2]=	

Governance

I. Business Strategy:

I.1. Strategic Planning and Strategic Alignment

G1: STRATEGIC PLANNING & ALIGNMENT	Level 1	Level 2	Level 3	Level 4	Level 5
Role of IT in Strategic Business Planning	Not considered as a strategic component of the organization	Limited to the role of business process enabler	Business process driver	Business strategy enabler/driver	IT and business co-adaptive
Benchmarking	Not generally practiced	Informal	Focused on specific processes	Routinely performed on a enterprise wide scale	Routinely performed and extended to include partners
Business strategic planning	Ad-hoc and unstructured	Strategic planning focused on core functions	Some inter-organizational planning	Managed across the enterprise	Integrated across and outside the enterprise
Total Business Strategy [(A1+A2+A3)/3]=					

2. Knowledge Management

L1: KNOWLEDGE MANAGEMENT	1- Possible	2 - Encouraged	3- Enabled /Practiced	4- Managed	5- Continuously Improved
Level of knowledge sharing within the organization	Knowledge sharing is not encouraged	Value of knowledge assets is recognized by the organization.	Sharing of knowledge assets is practiced.	Employees find it easy to share knowledge assets.	Mechanisms and tools to leverage knowledge assets are widely accepted.
Perceived value of knowledge sharing	People do not seem to value knowledge sharing; Some people, who understand the value of knowledge sharing, do it.	Sharing is recognized and rewarded.	Knowledge Management related activities are a part of normal workflow	Employees expect to be successful in locating knowledge assets if they exist. Knowledge sharing is formally/informally, monitored/ measures.	There is a systematic effort to measure and improve knowledge sharing
Handling of knowledge assets	Knowledge assets are normally not identified and stored in a structured way.	Explicit knowledge assets are stored in some fashion. Tacit and implicit knowledge is tracked.	Knowledge management systems/tools and mechanisms enable activities with respect to knowledge sharing. Centralized repositories exist. Knowledge taxonomies exist.	Training and instruction is available for KM systems usage. Change management principles are used to introduce KM practices. Tools for supporting KM activities are easy to use.	Tools for sharing are periodically updated/improved. Business processes that incorporate sharing of knowledge assets are periodically reviewed.

What characterizes cross-training and education in your organization	Minimum levels of education and cross training.	Performed for isolated parts within functional silos	Performed at the functional level.	Performed across the organization.	Reaching outside the organization.
Status of formal Inter/intra organizational learning	Casual, ad hoc and irregular	Informal and irregular	Regularly performed, no clear strategy	Clear strategy , routinely performed	Strong and structured
Total Knowledge Management [(A1+A2+A3+A4+A5)/5] =					

2.1. Service Level Agreements

L2 SERVICE LEVEL AGREEMENTS	Level 1	Level 2	Level 3	Level 4	Level 5
Service level agreement maturity	Unstructured and sporadically present within the organization	Technical at the functional level. SLAs are designed locally and not formally aligned with the overlaying strategic goals.	Emerging standards governing SLAs are emerging across the enterprise. No formal control is in place.	Enterprise wide standards and business linkage of SLAs are in use or are being implemented.	SLAs are extended and planned together with external partners
Service level agreement maturity					

2.2. Business Metrics

L3 BUSINESS METRICS	Level 1	Level 2	Level 3	Level 4	Level 5
Maturity of IT Metrics	Technical; Not related to business	Focused primarily on cost efficiency	Traditional financial metrics, not tailored for IT	Based on cost effectiveness for IT across the organization	Extended and connected with external partners
Maturity of Business metrics	Ad-hoc or no formal plan for metrics within the organization	Run by and focused on measuring metrics belonging primarily to the functional organization	Traditional financial metrics	Customer based measurements	Metrics extended to external partners
Maturity of metrics linkage	Ad-hoc or majority of metrics unlinked	Business and IT metrics unlinked	Emerging business and IT metrics linked	Business and IT metrics linked	Business, partners and IT metrics linked
Organizational standard definitions	No standardization processes	Standards defined within separate functions	Emerging enterprise standards	Enterprise standards	Inter-enterprise standards
Total Business Metrics Maturity [(A1+A2+A3+A4)/4]=					

KNOWLEDGE MANAGEMENT MATURITY OVERALL

L1:Knowledge management

L2:Service level agreements

L3:Business Metrics

G2:Overall Knowledge management Maturity Level $[(L1+L2+L3)/3]=$

3. Project Management

Set #1:

L1 PROJECT MANAGEMENT	1 = This does not fit the organization.	2= Low level of fit for the organization	3 = Moderate fit for the organization.	4 = This fits most of the organization.	5 = Strong level of fit throughout the organization.
The organization has a good general competence in initiating and executing projects.					
The organization has an approved Project Handbook or manual for the way internal projects should be initiated and run					
There is a good interplay between the projects, the functional line managers, and stakeholders outside the project organization					
All projects are executed in a professional manner, and they achieve their goals within the planned time and budget					
The organization has a good knowledge in how to priorities resources between projects within a project portfolio.					
The management has a good picture of how the project portfolio supports the current and future goals of the organization.					
The organization has good methods and systems for reporting and communicating between all projects within the project portfolio.					
The organization has a Project Office, a Project Coordinator, or similar, who tracks and overviews all ongoing projects in the organization.					
Total Project Management "SET1" Maturity $[(A1+A2+...+A7+A8)/8]=$					

Set #2:

L1 PROJECT MANAGEMENT MATURITY	Level 1	Level 2	Level 3	Level 4	Level 5
Level of project management ability in the organization	The organization still struggles with understanding and establishing basic project management processes.	Individual project planning, re-learning and sup-optimization is common across the organization.	The organization is capable of systematic and structured project planning and control for individual projects	The organization has the ability to plan and control multiple projects in a professional matter.	The organization utilizes innovative ideas to improve PM processes and practices.
Major Organizational Characteristics of PM	Lack of senior management support, project success depends on individual efforts	Project management is reasonably strong within the core area of the project group; outside this area the formal PM skills are low.	Informal training of PM skills and practices	Formal PM training for project team	Dynamic, energetic, and fluid organization, Continuous improvement of PM processes and practices
Project data management	PM data are not consistently collected or analyzed for further analysis	Informal PM data are collected and used locally for new projects	Formal PM data are managed and available across the organization	PM data and processes are integrated; PM processes data are quantitatively analyzed, measured, and stored.	PM processes are fully understood. PM data are optimized and sustained
Total Project Management "SET2" Maturity [(A1+A2+A3)/3]=					

3.1. Risk Orientation

L3 RISK ORIENTATION	1	2	3	4	5
Risk, rewards /penalties	Risk takers takes risks with little reward	IT takes most of the risk with little reward	Risk tolerant; some reward	Risk acceptance and rewards shared	Risk and rewards shared
Risk orientation maturity					

PROJECT MANAGEMENT MATURITY OVERALL

L1:Set 1

L2:Set2

L3:Risk Orientation

G3:Overall Knowledge management Maturity Level $[(L1+L2+L3)/3]=$

4. Business Management

4.1. Structure

L1 STRUCTURE	Level 1	Level 2	Level 3	Level 4	Level 5
Reporting /organization Structure	Central/decentral (CIO reports to CFO)	Central/decentral Some co-location (CIO reports to CFO)	Central/decentral some federation(CIO reports to COO)	Federated(CIO reports to COO or CEO)	Federated (CIO reports to CEO)
Structure Maturity					

4.2. Management Style

L2 MANAGEMENT STYLE	Level 1	Level 2	Level 3	Level 4	Level 5
Management style	Command and control	Consensus-based	Results based	Profit/value based	Relationship based
Relationship style between organizational elements	Conflict or Minimum relationships	Primarily focused on short transactional relationships	Emerging valued service provider between elements	Elements considered as valued service provider	Valued partnership
Management Style Maturity [(A1+A2)/2=					

4.3. Locus of power

L3 LOCUS OF POWER	1	2	3	4	5
How is the power distributed across the organization	Concentrated in the senior business managers	The managers of the functional organization	Emerging across the organization	Across the organization	All executives, including CIO and partners
Locus of power Maturity					

BUSINESS MANAGEMENT MATURITY OVERALL

L1:Structure

L2:Mannagement Style

L3:Locus of power

G4:Overall Business management Maturity Level $[(L1+L2+L3)/3]=$

5. Change Management Maturity

L1 CHANGE MANAGEMENT	1 Ad hoc or Absent	2 Isolated Projects	3 Multiple Projects	4 Organizational Standards	5- Organizational Competency
How is progress and status of change initiatives communicated?	Communications from the project are on a 'need to know' basis only and typically infrequent	Elements of communication planning are evident, but there is little sponsorship or coaching as part of change management.	Some elements of knowledge sharing emerge between teams in the organization; experiences are shared between teams in some departments or divisions.	Status updates from ongoing change projects is shared proactively to interested parties	Information regarding future, ongoing and previous projects are managed and kept available for everyone
Which level of change management maturity can be observed in the organization?	Project leadership is focused only on the "concrete" or tangible aspects of the project including funding, schedule, issue tracking and resource management	A large variation of change management practices exists between projects with many different change management approaches applied sporadically throughout the organization; Some projects may be effectively managing change while others are still in Level1.	Structured change management processes are being used across multiple projects; multiple approaches and methodologies are being utilized.	There is an enterprise-wide acknowledgement of what change management is and why it is important to organizational success.	Effectively managing change is an explicitly stated strategic goal, and executives have made this a priority.
How mature is the change management competency development and training in the organization?	Employees find out about the change first through rumors and gossip rather than structured presentations	Managers and supervisors have no formal change management training to coach their employees through the change process	While change management is applied more frequently, no organizational standards or requirements exist; pockets of excellence in change management co-exist with projects that use no change management	Training and tools are available for executives, project teams, change leaders, managers and supervisors. Managers and supervisors are provided formal training in change management.	Managers and supervisors routinely use change management techniques to help support a broad range of initiatives from strategy changes to individual employee improvement. - Extensive training exists at all levels of the organization

How is the skills and knowledge regarding change management managed in the organization	Supervisors and managers have little or no information about the change, and have no change management skills to coach their employees through the change process.	Little interaction occurs between the isolated project teams using change management; each new project “re-learns” the basic change management skills.	Senior leadership takes on a more active role in sponsoring change and consider this role part of their responsibilities, but no formal company-wide program exists to train project leaders, managers or coaches on change management.	A functional group or similar is created to support change initiatives, with roles like ‘Director of Change Management’; organizations create a ‘center of excellence’ – individuals, groups or administrative positions dedicated to supporting change management efforts and building change management skills.	Change management is perceived as one of the most critical management aspects in the organization and enjoys full attention from both a resource and senior sponsorship perspective
With which frequency are projects focused on continuous improvements performed?	No formal projects	Minimum support for incremental improvement projects	Emerging as a standard part of organizational change management	Frequently performed and is partly included in the planning and budget processes	Completely integrated in the organization
Total Change Management Maturity [(A1+A2+A3+A4+A5+A6)/6]					

5.1. Training:

L2TRAINING	1 = this does not fit the organization.	2= low level of fit for the organization	3 = moderate fit for the organization.	4 = this fits most of the organization.	5 = strong level of fit throughout the organization.
The majority of your employees are experienced in technology-based /or assisted training (e.g computer based training, multimedia-based learning, etv)					
Employees will probably voluntarily conduct prescribed training.					
Most employees will have time for conducting individual training sessions.					
The organization is ready for conducting large scale training sessions.					
Total Training Maturity [(A1+A2+A3+A4)/4=					

CHANGE MANAGEMENT MATURITY OVERALL	
L1:Change Management	
L2:Training	
G5:Overall Change management Maturity Level $[(L1+L2)/2]=$	

BUSINESS GOVERNANCE MATURITY OVERALL	
G1:Business Strategy Maturity	
G2:Knowledge Management Maturity	
G3:Project management Maturity	
G4:Business Management Maturity	
G5:Change Management Maturity	
BG:Overall Business Governance Maturity Level $[(G1+G2+G3+G4+G5)/5]=$	

OVERALL CUSTOMER MATURITY	
IT ARCHITECTURE MATURITY(IT)	
PROCESS MATURITY(P)	
CULTURE(C)	
BUSINESS GOVERNANCE MATURITY(BG)	
TOTAL: [(IT+P+C+BG)/4]=	