

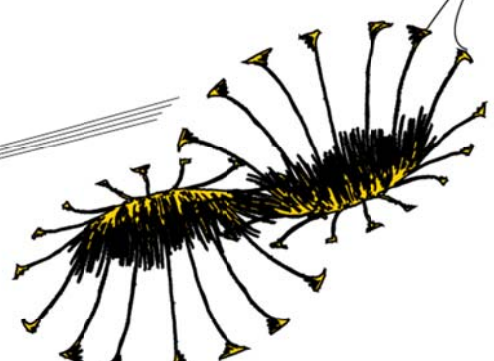


MASTER THESIS BUSINESS INFORMATION TECHNOLOGY

VICA: THE DUTCH WINDMILL

TOWARDS A CONTEMPORARY BUSINESS INFORMATION MANAGEMENT MATURITY MODEL

WIESAL JHANJHAN



UNIVERSITY OF TWENTE.



 **Capgemini**
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MASTER THESIS

VICA: THE DUTCH WINDMILL

TOWARDS A CONTEMPORARY BUSINESS INFORMATION MANAGEMENT MATURITY MODEL

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Abstract

Purpose

Information management is a relatively young field. Although it earned a prominent position in a wide range of organizational contexts, in most organizations the area is still immature. Field research by Capgemini has shown that a major part of the surveyed organizations have a level 1 or 2 maturity on a 0-to-5 scale maturity level. Though for most organizations the concern of having an information management department is clear, bringing it to a more mature level is not that straightforward. Existing maturity models are not complete or are outdated from certain perspectives. Some models only comprise certain aspects of the information management field. There is a need for a practical maturity model that will give insight to an organization where it is currently positioned. The present study delivers a proposal maturity model on information management with contemporary focus areas.

Methodology

The starting point of the present research is the existing maturity models of business-IT alignment and information management. We learn what topics are common and recurring in those models and what is less present in the models. In addition to the literature study we also interview 13 Capgemini practitioners on their thoughts, perceptions and observations regarding current information management topics they see happening at clients' sites. By combining the literature study and the interviews with practitioners we arrive at the draft domains for our maturity model. The next step is to further elaborate on the possible relevant characteristics of the identified domains. This is achieved by another round of interviews with Capgemini practitioners on their ideas for key characteristics for the domains. At this point we have a blank framework. We populate this framework by interviewing information management experts from 17 organizations in various industries. Finally as part of our evaluation of the proposed maturity model, we conduct a focus group and a walkthrough interview with Capgemini practitioners.

Findings

We found four domains that cover a broad range of the information management field. The domains are value, innovation, co-creation and agility (VICA). These domains are complemented with key characteristics derived from the interviews with practitioners from external organizations. This results in the VICA maturity model. In the VICA model we have distinction between two maturity groups: a lower maturity group and higher maturity group. The lower maturity group corresponds to organizations with a 1 or 2 maturity level on a 0-to-5 scale maturity level. For the higher maturity group we attribute organizations with a 3 or 4 maturity level. Subsequently we found possible future developments for each maturity group based on the four domains.

Contribution

The present study makes three contributions: one to theory and two – to industrial practice. First, it contributes to theory by revealing an information management maturity model that is relevant for present time. Existing maturity models as whole do not cover the topics that are appropriate for organizations at this moment. Since scientific literature is limited on the understanding of

information management in the Netherlands the study contributes to the exploration of the field. Second, the present research contributes to information management practice in two ways: the results open up the possibility for practitioners to see how complete and mature information management is at their organization according to our model. Next, organizations like Capgemini can develop specific services based on our findings to enhance the state of information management in an organization.

Implications

At this point we have explored the field of Information Management by looking at it from different perspectives: the VICA domains. Organizations can take the study results into account for assessing their information management maturity state. For example, how is a project valued or what is the impact of information management on innovation? This can give an indication on the maturity of information management. However, we acknowledge that more research is needed to validate and extend the model. With quantitative studies, we can say with certainty that the model and its characteristics are relevant. Perhaps the model could be complemented with additional data, which will strengthen the evidence of its usefulness in practice.

Acknowledgements

Proudly I present to you my thesis for the master Business Information Technology. In this document you can find the outcomes of my research on Business Information Management (BIM) conducted at Capgemini. It was an interesting and challenging journey to explore the field of BIM maturity and developing a model. I am thankful to many people, without them this study would not have been possible.

First of all I would like to thank the practitioners from several organizations who have participated in my case study interviews providing valuable input. These practitioners have described the state of BIM at their organization and given their professional opinion on how they think the field will evolve.

The consultants and members of the Business Information Management project team at Capgemini have given me an insight into the field of BIM. The talks and meetings I had with everyone were very useful for the study and my personal development. I also appreciate the leads I got from these Capgemini colleagues to talk with other experts on BIM.

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List of abbreviations

BIM	Business Information Management
BITA	Business-IT alignment
IM	Information management
MM	Maturity model
VICA	Value, innovation, co-creation and agility

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1 Introduction

1.1 Problem description

In 2012 a survey conducted amongst Dutch information managers by Capgemini (Capgemini Nederland B.V., 2012), showed that most companies in the Netherlands are in a starting phase with regard to information management. Gartner's Enterprise Information Management (EIM) model (Newman & Logan, 2008) was used to identify the organization's maturity level of information management. Capgemini experiences that Gartner's model focuses just on a specific part of the information management spectrum and therefore not includes all the important dimensions. The EIM model mainly looks at the data and information component while Capgemini is interested in a broader perspective, which includes for example more organizational variables like the number of information managers and the amount of people/teams working for the information manager. The need for this broader perspective is also recognized by the surveyed organization of the Capgemini IM survey (Capgemini Nederland B.V., 2012). A more extensive model would aid to a better analysis of client organizations which would help those organizations improve their Business-IT alignment.

1.2 The Capgemini context

Capgemini is a global corporation founded in 1967 in France. It is one of the largest IT organizations in the world. Capgemini provides consulting, technology, financial and outsourcing services in 44 countries around the globe. Over 120.000 employees worldwide and more than 5.000 employees in the Netherlands work at the French enterprise. The present study is conducted at the Business Technology Division of the Technology Services branch. Within this branch there is a business information management project group that is concerned with developments on IM in the business field. The present research is carried out for this specific business information management group.

1.3 Research goal

Capgemini desires a comprehensive model which enables them to analyze an organization concerning their maturity on relevant aspects of information management. The maturity model should distinguish several levels. Each level should have specific characteristics such that an organization can be allocated to a certain level and it enables the organization to take measures to advance to the next maturity level.

The main research question is defined as follows:

What is the appropriate information management maturity model for Capgemini?

The research goal is to develop a maturity model that fits the requirements of Capgemini. Important to note is that the model should be practical and applicable, and also it should focus on relevant domains.

1.4 Research motivation

Information management is a relatively young field. In 2003 Maes (2003) states that information management is still looking for its place and identity in the organization. Today, the information management field has acquired its position in the organizational context. However in most cases the area is still immature (Capgemini Nederland B.V., 2012). The Capgemini IM survey (Capgemini Nederland B.V., 2012) shows that a major part of the surveyed organization have a level 1 or 2

maturity on a 0-to-5 scale maturity level. Although for most organization the concern of having an information management department is clear, bringing it to a more mature level is not that straightforward.

To a certain extent existing models and maturity models are not complete or are outdated from certain views. Some models only comprise certain aspects of the information management field. There is a need for a practical maturity model that will give insight to an organization where they currently are positioned and what steps are needed to progress. More important is that the maturity model covers a wide but comprehensive aspect of domains that are essential for this moment.

As stated earlier, most organization are quite immature with regard to information management maturity. Major steps could be taken if the path to be taken is clear. A well-developed information management department contributes to the business. Projects progress in an improved manner and perhaps business is more satisfied with the solution supplied by IT, with the help of the information manager. At the end, a well develop information management department in an organization may lead to more innovation, co-creation and agility.

1.5 Research model

To answer the central research question in this master graduation project, a research model has been designed. It was inspired by models that other researchers used in research situations similar to the one presented at this thesis, e.g. where a researcher developed a maturity model for Business IT alignment, as it can be found in the paper of Santana Tapia, Daneva & Eck (2007). The figure below shows the steps taken in the research process.

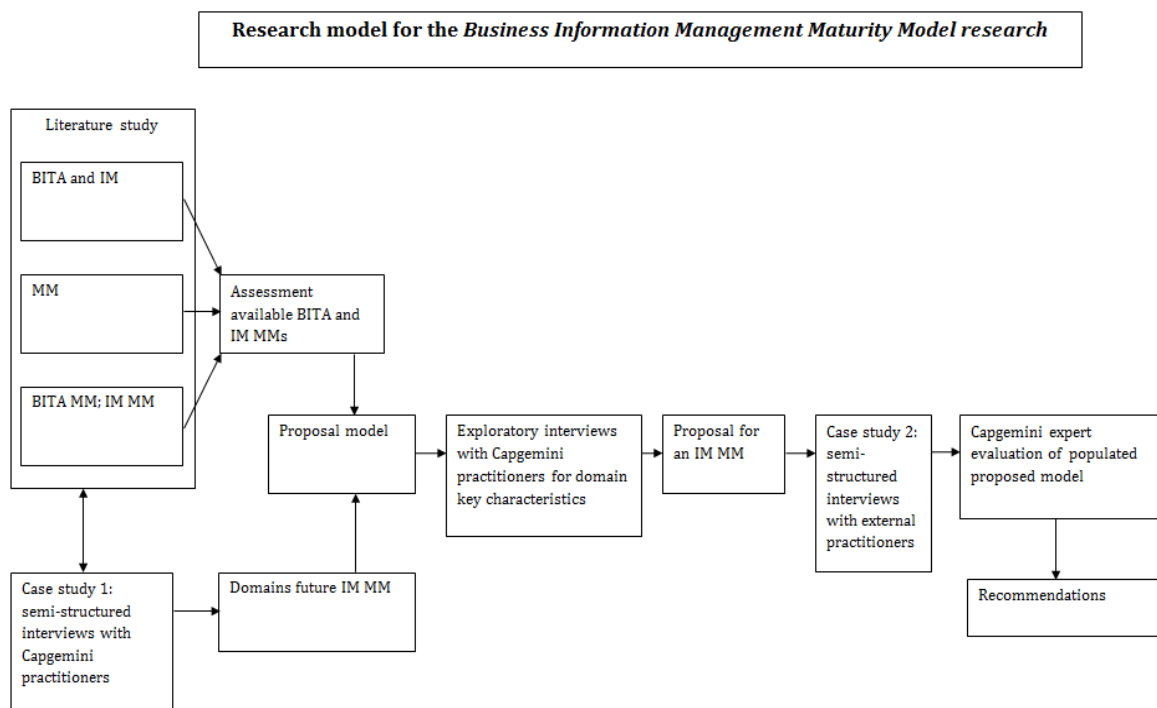


Figure 1 - Research model

As figure 1 indicates, this research starts with a literature review on published sources on topics such as maturity models in general and BITA maturity models, in particular. The outcomes of this review

would inform a case study with Capgemini practitioners on the concepts to consider when thinking of a MM for information management. Once we assess the outputs from both the literature review and the practitioners' case study, we will propose a first draft of the domains to include in a maturity model for information management. Our next step, then, is to populate the MM by defining the domain characteristics of the newly proposed MM. This is achieved by interviewing Capgemini clients on their information management policy. Finally we evaluate the proposal model from the perspective of the practitioners at Capgemini. Our research methodology is presented in more detail in Chapter 1.7.

1.6 Research questions

The purpose of the research is to deliver an information management maturity model. In order to reach that goal the following research questions have been devised:

Main research question

- What is the appropriate information management maturity model for Capgemini?

Sub-questions

- RQ1.1: What is Business-IT alignment?
- RQ1.2: What is a maturity model?
- RQ1.3: What is information management?
- RQ2.1: What Business-IT alignment and information management maturity models are available?
- RQ2.2: Which existing information management or Business-IT alignment maturity models could serve as possible candidate-solutions for Capgemini?
- RQ3.1: What are the domains for the Capgemini information management maturity model?
- RQ3.2: What are the key characteristics for the Capgemini information management maturity model?
- RQ3.3: To what extent are those characteristics useful for practitioners?

To formulate the above questions, we followed Wieringa's approach to decomposing a complex research questions into sub-questions (Wieringa, 2014). We also followed Wieringa's engineering cycle that postulates that a piece of industry-relevant research taking place in organizational settings with many stakeholders, follows the cycle of problem analysis, solution design and solution evaluation. In line with this reasoning, we identified the following actions:

- Action 1: Design proposal maturity model
- Action 2: Population proposal maturity model
- Action 3: Expert evaluation

1.7 Research methodology

The present research is structured according to the Design Science Research Methodology (DSRM) composed by Peffers, Tuunamen, Rothenberger, & Chatterjee (2007). This research methodology is selected due to its focus on design science and the manner in which conducting design science research is approached. Figure 2 exhibits the complete DSRM process and its individual stages.

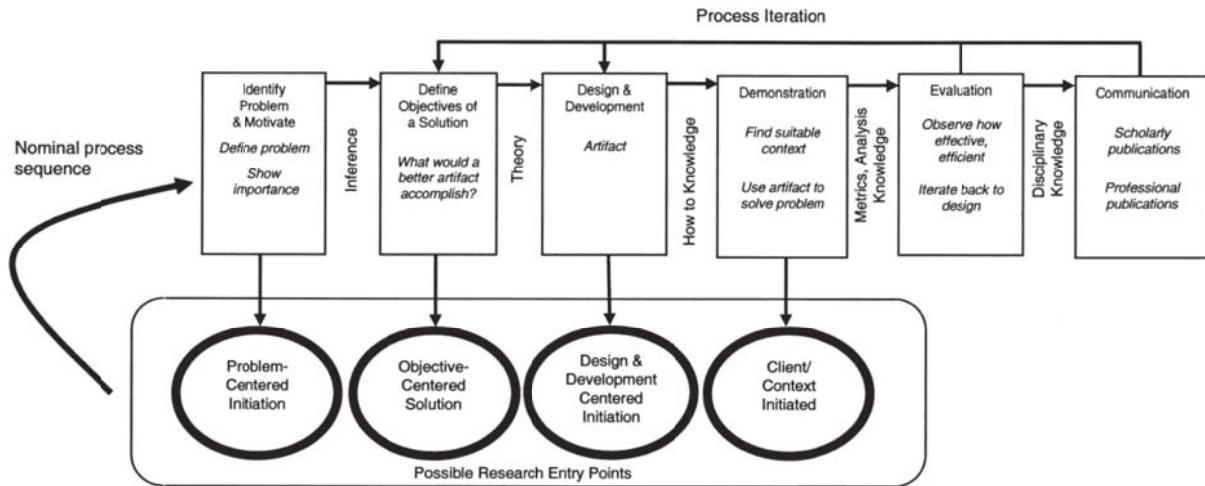


Figure 2 - Design Science Research Methodology process (Peppers, Tuunamen, Rothenberger, & Chatterjee, 2007)

The following stages of the DSRM process have been executed:

- **Problem identification and motivation**
Here the specific research problem is defined and motivation is given by showing importance of the study. In this thesis, the motivation for a new MM for information management is also traceable to high level strategic goals of the organization.
- **Objective of the solution**
In this phase the purpose of the research is given which includes the objectives of the solution. The solution – which is the MM itself, should be (1) practical, (2) applicable and (3) should focus on domains that are relevant for the field in this present time.
- **Design and development**
At this point the actual design and development of the artifact (i.e. our MM) is depicted.
- **Demonstration**
The artifact, the MM in our case, is used to solve the earlier identified problem(s).
- **Evaluation**
Here we examine how well the artifact behaves in the demonstration phase. In our case we evaluate the MM by conducting a focus group and expert interview.
- **Communication**
Finally the (complete) study is communicated to relevant audiences.

1.8 Document structure

The thesis is structured as follows. In chapter 1 we explain the study and its motivation. Next in chapter 2 an introduction is given on the main theoretical concepts: BITA, IM and MM. In chapter 3 we go deeper into the theoretical frameworks and existing maturity models that could be relevant for our study. Chapter 4 describes how we devised the fundamentals of our maturity model. In chapter 5 we explain how we will populate the maturity model by describing the case study and analysis methodology. Chapter 6 presents the results from the case study interviews. In chapter 7 we

describe the evaluation process with practitioners from the field. In chapter 8 we discuss the consequences of the study with regard to the scientific and the practical relevance. Finally, in chapter 9, we present the conclusion of the conducted research and recommendations for Capgemini. The following table presents the chapters, the corresponding Design Science Research Methodology stage and the related research questions.

Chapter	DSRM stage	Research questions
1 Introduction	Problem identification and motivation	-
2 Literature study	Problem identification and motivation Objective of the solution	RQ1.1 RQ1.2 RQ1.3
3 State of the art models	Objective of the solution	RQ2.1 RQ2.2
4 First case study: with Capgemini practitioners	Design and development	RQ3.1 RQ3.2 Action 1
5 Second case study: with external practitioners	Design and development	Action 1
6 Results	Design and development	Action 2
7 Evaluation	Demonstration Evaluation	RQ3.3 Action 3
8 Discussion	Evaluation	-
9 Conclusion	Communication	Main research question

Table 1 - Thesis structure and research steps

2 Literature study

This chapter introduces the fields of business-IT alignment, maturity models and information management. We first look at the current state of the fields business-IT alignment and information management and how these two fields are related to each other. The literature on maturity models is used to gather knowledge for the development of the information management maturity model.

Information management is a term that is primarily popular in the Netherlands. International scholars mainly address the phenomenon information management as business-IT alignment. However information management is not just another designation for business-IT alignment. Information management is the field that resides between the business (demand) and IT (supply), which if it is handled in a correct manner leads to a better business-IT alignment in general. For this reason business-IT alignment and other related terms are also included in the search for existing knowledge.

2.1 Business-IT alignment

Business-IT alignment has been an on-going research area for over three decades. The phenomenon has been first mentioned by McLean and Soden (1977) at the end of the 70s of the last century. In the last decade the BITA topic was prominently placed in the top 3 of the CIO agenda each year (Luftman, Kempaiah, & Nash, 2005). So it can be noted that the BITA research area still is in development. Although we can say that there has been notable progress since the beginning of BITA awareness. Many different models have been developed, each with diverse perspectives on how to achieve alignment. In the next chapter we will elaborate on a number of significant models. The evolution of IT over time also influenced the position of alignment. Where IT started as a functional role to support day to day operations only, e.g. setting-up mainframes and managing networks of computers, up to today where IT plays a vital role in improving the business, maximizing efficiency through project management and generating essential information to support decision making throughout the whole organization (Hoque, 2002).

The Oxford dictionary defines alignment as follows: arrangement in a straight line or in correct relative positions. Applying this on BITA, the business and IT function should be positioned in a way such that an organization can optimally benefit from this alignment. In the literature several definitions of BITA exist. Henderson and Venkatraman (1993) define BITA as the degree of fit and integration among business strategy, IT strategy, business infrastructure and IT infrastructure. Reich and Benbasat (1996) state that the contents of the business strategy, which includes the mission, objectives and plans, are shared and supported by the IT strategy, which includes the mission, objectives and plans, define the degree of alignment. Luftman and Brier (1999) describe alignment as the application of appropriate IT in given situations in a timely way and that these actions stay congruent with the business strategy, goals and needs.

The reason for organizations to be engaged with BITA has to do with supporting and improving operational business efficiency and effectiveness (Collins, Macehiter, Vile, & Ward-Dutton, 2007) and in identifying ways to control costs, improve quality and manage risk. This results in ways to achieve competitive advantage (Kearns & Lederer, 2003 & Seggie, Kim, & Cavusgil, 2006) and improvement of organizational performance (Sabherwal & Chan, 2001).

Different scholars have used numerous names to describe alignment. Other terms found in literature are fit (Chan, 1992, Henderson & Venkatraman, 1993), linkage (Reich, 1993), integration (Henderson & Venkatraman, 1993), bridge (Ciborra, 1997), harmony (Luftman & Brier, 1999), and fusion (Smaczny, 2001).

2.2 Maturity Models

According to Santana Tapia (2009) a maturity model describes the evolution of a specific entity over time, where this entity can be an organizational area or function. The purpose for an organization to assess their maturity has to do with identifying lacks of efficiency that can have a negative impact on business benefits. A maturity model is applied by assessing a specific area against a norm. The results from a maturity assessment gives an organization insight regarding the extent to which activities in the assessed areas are predictable. This means that the organization obtains an understanding on the evaluated area, whether it is sufficiently refined and documented so that the activities in this area have the potential to achieve their desired outcomes (Santana Tapia, 2009).

A well-known maturity model in the IT field is the capability maturity model (Paulk, Curtis, Chrissis & Weber, 1993) developed by Carnegie Mellon University's Software Engineering Institute. The CMM measures software process maturity by the extent to which the software development process is managed.

In 2002 the Capability Maturity Model Integration (CMMI) was presented as the successor of CMM. In contrast to the CMM, the CMMI is not specifically focused on software development. The CMMI currently distinguishes the following areas: product and service development, service establishment and management, and product and service acquisition (CMMI Institute, 2014). In section 2.5 we will go into more detail on the development of a MM.

2.3 Information management

Before we will discuss the topic information management, we first look at the meaning of information. Information is an abstract term, open to one's interpretation. When a person in Utrecht receives a message containing the current weather forecast in his area, this is considered information for that specific person. When another person in Enschede receives that same message, it is just a message containing data, it has no information for him. The difference is in the manner information is created, that is the interpretation of the ingredient raw data (Grit, 2012). Data is plain information with no meaning or context, e.g. numbers, symbols and text. Information is obtained by data that has been processed, the raw data now has a meaning or value. When information is utilized for existing business processes this leads to knowledge. Knowledge is the application of information in such a way that it is useful. The final state to be achieved is wisdom. By reaching wisdom one is able to evaluate his knowledge, be in a state of complete consciousness. Wisdom is the understanding about which previously has been no understanding (Bellinger, Castro & Mills, 2004). These successive steps of data, information, knowledge and wisdom are graphically shown in figure 3.

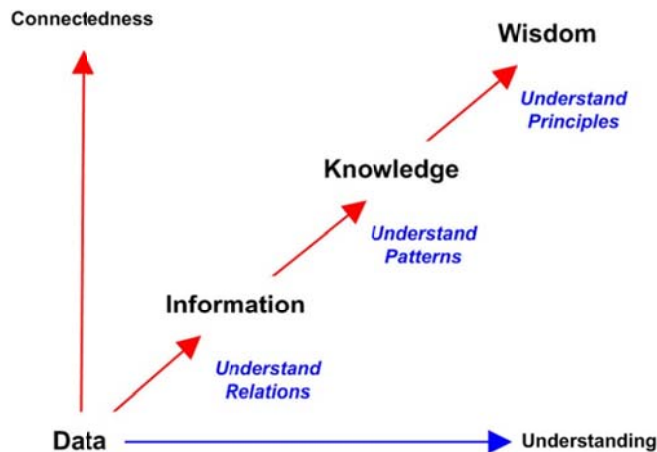


Figure 3 - Data, information, knowledge and wisdom (Bellinger, Castro & Mills, 2004)

Information management is not a new field that emerged with the development of IT. Before IT existed or was applied on a large scale, information management was done manually. A clerk stored paper documents, the information, in paper files and boxes. When needed the appropriate documents were retrieved. Nowadays the concept is the same, however with the potential of IT more is imaginable with information management. Without the support of IT a current trend like Big Data, would not have been able to exist in the shape we know today (Septer, 2013).

Maes (1999) describes Information Management as follows: *“it deals with the management of information as a business resource and, hence, encompasses all the processes and systems within an organization for the creation and use of information. Further, given the ubiquitous nature of information and communication technology (ICT), the business - ICT relationship has traditionally been a point of particular interest in IM”*. Thus the field of IM concerns on two aspects: 1) the management of information as a business resource, 2) the link between business and IT, also known as Business-IT alignment, which Maes approaches by introducing the C in IT, meaning communication. We will elaborate further on Maes’ Generic Framework in the next chapter. Throughout this document we use the terms business information management and information management interchangeably, since they depict the same meaning in our opinion.

2.4 BITA influencers

Several studies have been conducted to find out what causes business-IT alignment to be successful. These causes help organizations to improve their maturity on business-IT alignment, therefore it is essential to have a comprehensive model that takes all significant aspects into account. The found influencers are presented in this section.

Enablers and inhibitors of Business-IT alignment (Luftman, Papp & Brier, 1999)

Enablers	Inhibitors
Senior executive support for IT	IT/business lack close relationships
IT involved in strategy development	IT does not prioritize well
IT understands the business	IT fails to meet its commitments
Business - IT partnership	IT does not understand business
Well-prioritized IT projects	Senior executives do not support IT

IT demonstrates leadership	IT management lacks leadership
----------------------------	--------------------------------

Table 2 - Enablers and inhibitors of Business-IT alignment (Luftman, Papp & Brier, 1999)

Factors that influence the social dimension of alignment between business and information technology objectives (Reich & Benbasat, 2000)

Shared domain knowledge
Communication between business and IT executives
Connections between business and IT planning
Successful IT history

Table 3 - Factors that influence the social dimension of Business-IT alignment objectives (Reich & Benbasat, 2000)

Why haven't we mastered alignment (Chan, 2002)

CEO and CIO have a strong working relationship
Business and IS plans are closely linked
IS personnel participate in business planning
IS projects have business sponsors
IS personnel make lateral short- or long-term transfers into business partner areas
Incentive/compensation bonus schemes exist

Table 4 - Relationship between Business and IT (Chan, 2002)

What we see is that elements of governance, project management, strategy/planning, understanding, partnership, communication and financial incentives play a critical role to achieve successful BITA. We will take these aspects into account when assessing existing models and developing our own model.

2.5 Creating a maturity model

The development of maturity models is not extensively presented in literature. Most work focuses on the outcome of the development process, the model itself. Santana Tapia (2009) describes his own approach for the development of a maturity model for business-IT alignment in networked organizations. Figure 4 below shows the development process.

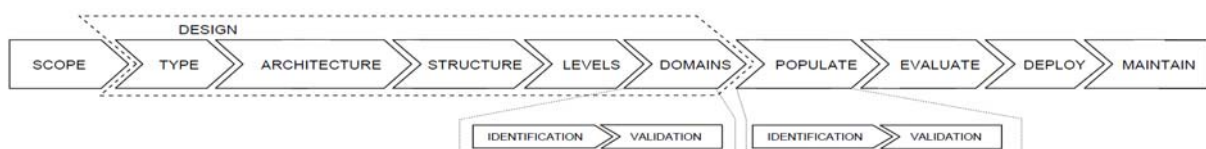


Figure 4 - Maturity model development process (Santana Tapia, 2009)

In order to start with the design process, the scope of the model needs to be defined. By this Santana means to set the boundaries for the use of the model and to define the purpose of the model. Executing this step differentiates the future MM from existing MMs. After having defined the scope, designing the actual model follows.

Type

Depending on the purpose of the model, two types of MMs can be identified: assessment MMs and development MMs. Assessment MMs are normative models which serve as assessment tools. Motive

for the assessment type is for certification and help create or improve the organization's image as a reliable partner. Development MMs are utilized by organizations for the need of guidance and focus for implementing best practices and key process areas. This should lead to improvements and better results. Thus the first type MM is on behalf of external purposes whereas the second type MM is in support of internal purposes.

Architecture

The architecture depicts how the different maturity levels can be reached. According to CMMI there are two options: staged and continuous. The staged representation provides a standard sequence of improvements, one stage at a time is handled. It can act as a benchmark by comparing the maturity of different projects and organizations. The continuous representation focuses on a specific process or related processes that are important for an organization's business objectives. It allows an organization to improve different processes at a different rate.

Structure

A MM consists of different components which are presented in the structure. The structure shows if the MM includes domains, key process areas and goals, and how they are decomposed and used to reach maturity levels.

Maturity levels

Here the number of discrete levels of maturity for the model (typically five or six) are defined, including their qualifiers and definitions.

Domains

The final step in the design process of a MM is to identify the domains to which the levels apply. A domain is a relevant aspect within the scope of the MM. After the domains have been identified, they need to be validated in order to ensure that they correspond to the purpose of the MM.

Populate

Following the design steps of the model, population of the MM is next. The model is populated by identifying process areas for each domain. Santana Tapia (2009) defines a process area as a group of practices in a domain which, when implemented collectively, satisfy goals considered important for making an improvement in that domain.

Evaluate, deploy and maintain

Validation of the model is done to evaluate its applicability and generalizability. The entire MM is tested for relevance and rigor. After that the MM is made ready for execution to verify its use, the deploy step. In order to provide the model's acceptance and to improve its standardization, the MM must be applied in organizations that differ from the ones that were involved in its design and population. The final step is to maintain the model. This is done by tracking the evolution of the organizational area or function that is assessed and the requirements of the organizations that apply the MM. This ensures that the model stays up-to-date over time.

3 State of the art models

In this chapter we review theoretical business-IT alignment models and maturity models. The theoretical models are considered to be the foundation of the BITA field. The maturity models are selected based on the relevance for the future maturity model. The aim is to find out how each maturity model is composed and to identify significant parts of the models that may be reused. We start the review with the foundation BITA and IM models by Henderson and Venkatraman (1993) and Maes (1999). Thereafter we will describe five BITA and IM maturity models.

3.1 Theoretical frameworks

3.1.1 Strategic Alignment Model (SAM)

The SAM by Henderson and Venkatraman (1993) has been the foundation for most BITA models. The model is constructed from four domains: business strategy, IT strategy, organizational infrastructure and processes, and IT infrastructure and processes. These domains are connected through the links strategic fit and functional integration. Strategic fit describes that IT strategy should be expressed in terms of an external domain (how the firm is positioned in the IT marketplace) and an internal domain (how the IT infrastructure should be configured and managed). This is the same case for business strategy and organizational infrastructure and processes. The functional integration integrates the business and IT on a strategic and operational level. See figure 5 for an overview of the model.

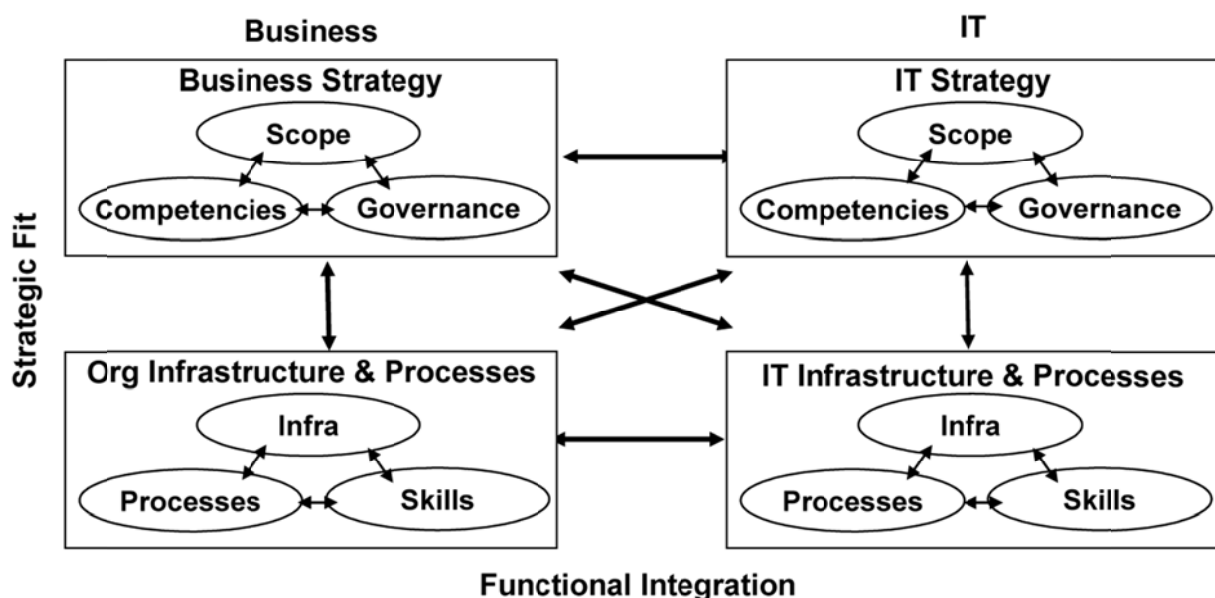


Figure 5 - Strategic Alignment Model (Henderson and Venkatraman, 1993)

3.1.2 The generic framework

The generic framework developed by Maes (1999) is an extension on the Strategic Alignment Model by Henderson & Venkatraman (1993). An additional functional and strategic layer is added to the SAM. With this addition, information providers are distinguished from the systems that provide information. This results in a new information domain that represents the knowledge, communication and coordination of information. Figure 6 depicts the structure of the generic framework.

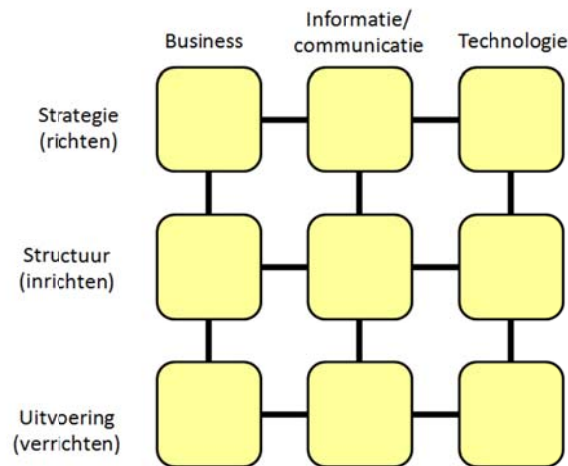


Figure 6 - The Generic Framework (Maes, 1999)

3.2 Maturity models

In this section a number of business-IT alignment and information maturity models are described. We look at how the models are structured and what the focus of the domains is. Table 5 gives an overview of the assessed maturity models.

Maturity model	Author
Strategic Alignment Maturity Model (SAMM)	Luftman, 2003
Gartner Enterprise Information Management (EIM)	Newman & Logan, 2008
IBM Data Governance Council Maturity Model	IBM Data Governance Council, 2007
IDC maturity model	Duffy, 2001
COBIT 5 - Process Capability Model	Information Systems Audit and Control Association (ISACA), 2012

Table 5 - Overview assessed maturity models

3.2.1 Strategic alignment maturity model (SAMM)

The strategic alignment maturity model developed by Luftman (2003) is based on Henderson & Venkatraman's (1993) Strategic Alignment Maturity and on research on business-IT enablers and inhibitors (Luftman, Papp & Brier, 1999). SAMM is modelled after the CMM methodology (Paulk, Curtis, Chrissis & Weber, 1993) but focuses more on a strategic set of business practices. The objective of Luftman's model is to recommend improvements on business-IT alignment for the assessed organization.

SAMM distinguishes six different domains, or so called IT-business alignment criteria, that determine the maturity level. These domains are: communications, competency/value measurement, governance, partnership, scope and architecture and skills. An overview of the domains with their specific properties is given in figure 7.

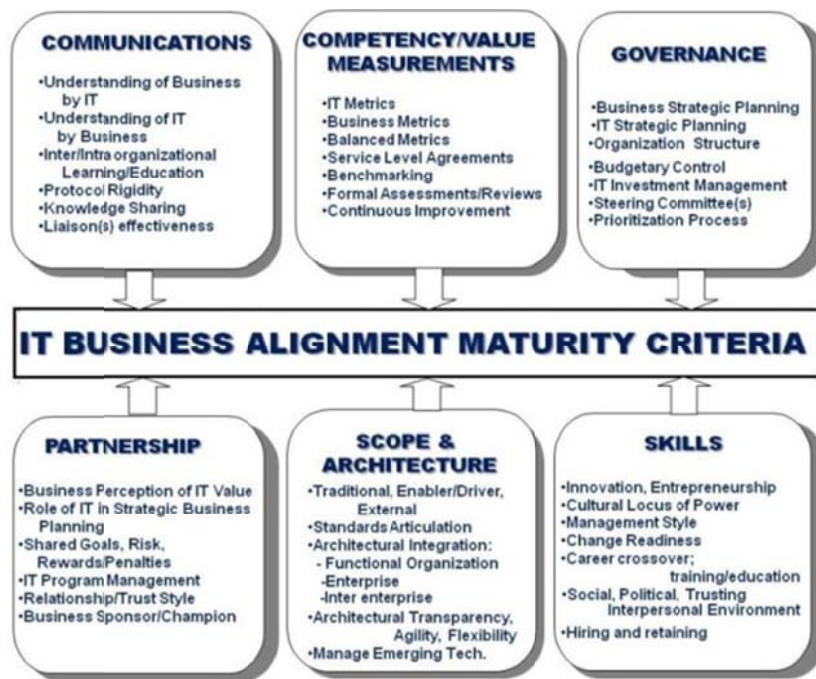


Figure 7 - Strategic Alignment Maturity domains (Luftman, 2003)

Communications

Communications explains how ideas, knowledge and information between business and IT are exchanged so that a mutual understanding can be achieved between both parties. The purpose is to set clear priorities in order to accomplish organization wide goals.

Competency/Value Measurement

Competency/Value Measurement is understood as the presence of tools and data that enable the determination of added value of IT for the organization. For example when projects are completed is there an evaluation on what went right and what went wrong.

Governance

Governance describes how IT is applied for the purpose of achieving organizational goals and the way of decision making regarding the deployment of IT resources. An important question is whether the IT strategy follows the business strategy.

Partnership

Partnership is about to what extent business and IT have forged true partnerships based on mutual trust and sharing risks and rewards.

Scope & Architecture

Scope & architecture describes the degree in which IT is able to deliver a flexible infrastructure and quickly applies new technological developments to support business processes or in the development of new products or services.

Skills

The skills criteria explain the ability of employees to quickly react on changes in the business environment. Important is the understanding of the technical staff of business drivers and their ability to speak the language of the business. Also of importance is how well the business staff understands the relevant technology concepts.

Luftman defined five maturity levels to display the business-IT alignment maturity of an organization. The levels are: level 1 initial process, level 2 committed process, level 3 established process, level 4 improved process and level 5 optimized process. Below figure 8 depicts the different maturity levels.

Climbing the Strategic Alignment Maturity Model

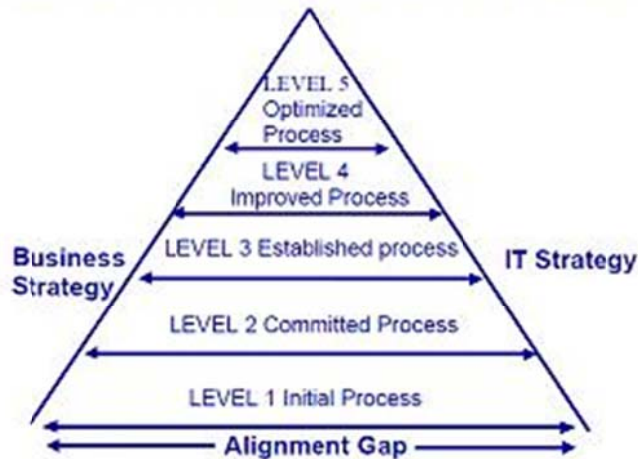


Figure 8 - Strategic Alignment Maturity Model (Luftman, 2003)

For organizations at level 1 it is highly unlikely they will be able to achieve an aligned IT and business strategy. This causes their investment in IT significantly unleveraged.

At level 2 it can be said that organizations have started taking steps to attain alignment. Most of these initiatives are at a functional division of the organization, e.g. marketing, finance or HR. Since the alignment efforts are at a functional level it can be difficult to be successful. When the initiative comes from the enterprise level it is more likely to succeed.

Level 3 focuses on governance, processes and communications with relation to specific business objectives. IT is getting involved in the business. From a traditional use of IT we go where IT is exploited to make business decisions.

Luftman (2003) states when an organization is at level 4 effective governance is present and IT is utilized as a value center. IT systems are used such that business process enhancements lead to sustainable competitive advantage. At level 4 IT is seen as an innovative and imaginative strategic contributor to success.

When an organization reaches level 5 maturity, there are sustained governance processes which integrate the IT strategic planning process with the strategic business process. IT systems are intra-organizational so that the organization can reach the supply chains of customers and suppliers

A domain consists of specific parameters. Each parameter has its own maturity level. Table 6 shows an example of the governance domain with two associated parameters.

Governance maturity	Level 1: Initial process	Level 2: Committed process	Level 3: Established process	Level 4: Improved process	Level 5: Optimized process
Formal Business Strategy Planning	Not done, or done as needed	At unit functional level, slight IT input	Some IT input and cross-functional planning	At unit and enterprise, with IT	With IT and partners
Formal IT strategy planning	Not done, or done as needed	At unit functional level, light business input	Some business input and cross-functional planning	At unit and enterprise, with business	With partners

Table 6 - Governance domain of the Strategic Alignment Maturity (Luftman, 2003)

3.2.2 Gartner Enterprise Information Management (EIM)

Research by Gartner has shown that managing information as a strategic asset is one of the top priorities of senior management (Newman & Logan 2008). In order to satisfy this need, IT leaders are tasked with the goal of managing information as a strategic asset. However the required actions to achieve that goal are not always clear. Therefore Gartner developed the Enterprise Information Management (EIM) maturity model which shows the steps to reach EIM maturity. The purpose of the maturity model is to create awareness about the value of information in the organization and getting the organization to exploit this to the utmost possible. Key to success is existence of awareness throughout the whole enterprise, including the lower part as well as top management.

Unlike most other maturity models, the Gartner model does not measure maturity from the perspective of domains. The EIM model indicates maturity on the awareness and perceived potential value of information.

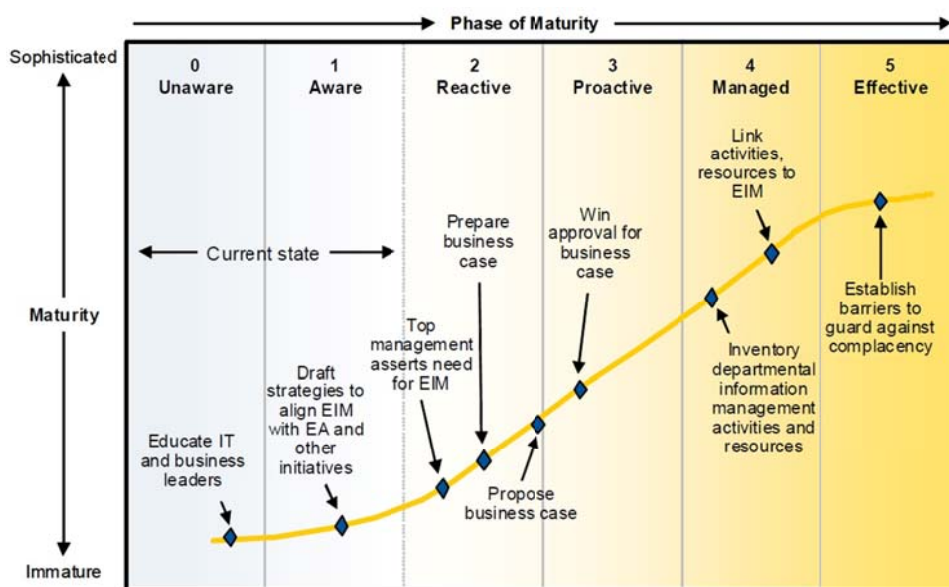


Figure 9 – Gartner Enterprise Information Management maturity model (Newman & Logan, 2008)

The EIM maturity model consists of 6 maturity levels. At level 0 the business and IT are not aware of the role of information. Decision making is done without adequate information. In this unconscious phase there lie risks for the organization, for instance compliance failures, poor customer service and low productivity. IT and business leaders should be educated on the potential value of EIM and the risk of its absence.

When an organization is at level 1 some awareness about information management has been achieved. The value of information is clear to people and they develop strategies to gather it. Senior management should be explained how the drafted strategies aligns EIM with other strategic projects like enterprise architecture.

At level 2 IT and business leaders are in favor for information management. Business units realize what the value of information is and make use of it in cross-functional projects. In this phase preparations for business cases on EIM should be made.

At level 3, information is recognized as necessary for improved business performance and as a result it shifts to EIM from a cross-function use. The business case should be proposed and opportunities for EIM should be identified.

At level 4, information is seen as critical for the business. Important aspects of EIM are implemented including a consistent information infrastructure. EIM strategy should be linked to departmental information management activities and resources.

When the organization reaches level 5 it is fully matured. Information is utilized across the entire information supply chain. Information is perceived as a competitive advantage and used to create value and increase efficiency. When at this level it is of importance to keep in mind that information excellence can diminish when the business changes with no trouble. Figure 9 shows the maturity phases including the specifics for each stage.

3.2.3 IBM Data Governance Council Maturity Model

The IBM Data Governance Council is a collaboration between 55 companies, universities and business partners. This alliance facilitates practitioners to do research on data governance, making benchmarks and best practices are some of the results. The model (IBM Data Governance Council Maturity Model, 2007) is relevant since it recognizes that managing corporate data results in a better business operation. IBM defines data governance as a quality control discipline which brings new rigor and discipline to the process of managing, using, improving and protecting organizational information by structuring people, processes and technology. When data governance is effectively applied it can improve the quality, availability and integrity of enterprise information by fostering cross-organizational collaboration and structured policy making.

The authors state that most organizations are in a starting phase on examining their data governance practices and searching for frameworks that can assist their exploration. The IBM Data Governance Council Maturity Model (from now on the DG model) offers a way to improve the application of data governance. The DG model enables organizations to assess where they currently are with regard to governance, where they want to be ultimately and the steps needed to reach that level.

The maturity model is based on the CMM developed by SEI (CMMI Institute, 2014). There are 5 levels: initial, managed, defined, quantitatively managed and optimizing. Figure 10 illustrates the levels and their key characteristics.

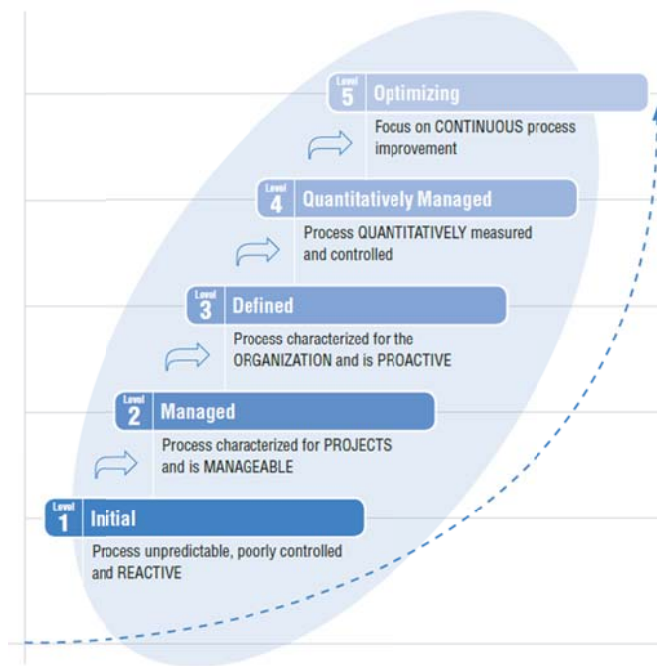


Figure 10 - IBM Data Governance Council maturity levels (IBM Data Governance Council Maturity Model, 2007)

The maturity of data governance is determined on 11 domains. These domains can be grouped into 4 primary groups: outcomes, enablers, core disciplines and supporting disciplines. Each domain consists of several sub domains which can be ranked into five levels of maturity. There are transition layers between maturity levels so concrete steps and milestones can be identified by the organization. Figure 11 shows the classification of the domains into the 4 groups. Table 7 explains the domains.

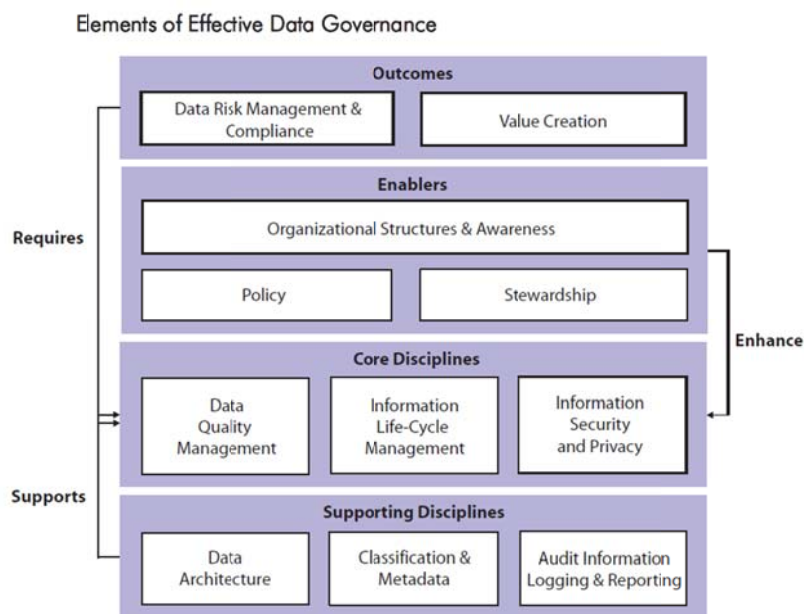


Figure 11 - IBM Data Governance Council domains (IBM Data Governance Council Maturity Model, 2007)

Domain	Description
Data Risk Management & Compliance	The methodology by which risks are identified, qualified, and quantified, avoided, accepted, mitigated or transferred out.
Value Creation	The process by which data assets are qualified and quantified to enable the business to maximize the value created by data assets.
Organizational Structures & Awareness	Description of the level of mutual responsibility between the business and IT, and the recognition of the fiduciary responsibility to govern data at different levels of management.
Policy	A description of the desired organizational behavior(s).
Stewardship	A quality control discipline designed to ensure custodial care of data for asset enhancement, risk management, and organizational control.
Data Quality Management	Methods to measure, improve and certify the quality and integrity of production, test and archival data.
Information Lifecycle Management	A systematic policy-based approach to information collection, use, retention, and deletion.
Information Security & Privacy	The policies, practices and controls used by the organization to mitigate risk and protect data assets.
Data Architecture	The architectural design of structured and unstructured data systems and applications that enable data availability and distribution to appropriate users.
Classification & Metadata	The methods and tools used to create common semantic definitions for business and IT terms, data models, data types, and repositories. Metadata that bridge human and computer understanding.
Audit Information, Logging & Reporting	The organizational processes for monitoring and measuring the data value, risks, and efficacy of governance.

Table 7 - IBM Data Governance Council domains specification (IBM Data Governance Council Maturity Model, 2007)

3.2.4 IDC maturity model

International Data Corporation (IDC) is a global provider of market intelligence and advisory services on IT. IDC offers knowledge on various topics that can be applied to achieve business objectives. The IDC maturity model is developed with focus on the change that is related to achieving excellence in managing key strategic business issues. The model (Duffy, 2001) is based on the premise that a true partnership between IT and non-IT executives is fundamental for success for organizations these days. It is believed that IT objectives and business objectives are interdependent. Separating these

two objectives into IT and non-IT objectives would be counterproductive in general and would therefore not contribute to a better business-IT alignment.

The maturity model is founded on a number of key success drivers (KSD), key performance indicators (KPI) and contributing factors. There are six KSDs that are considered to be critical contributors to the success of an organization. These KSDs can be considered as the domains of the model. The KPIs are characteristics on which maturity of a KSD is determined. Each KPI consists of a number of contributing factors that address a specific strategic question related to that KPI. Based on the maturity of the several contributing factors, the overall maturity of the KPI is determined. Figure 12 gives a structural overview of the model.

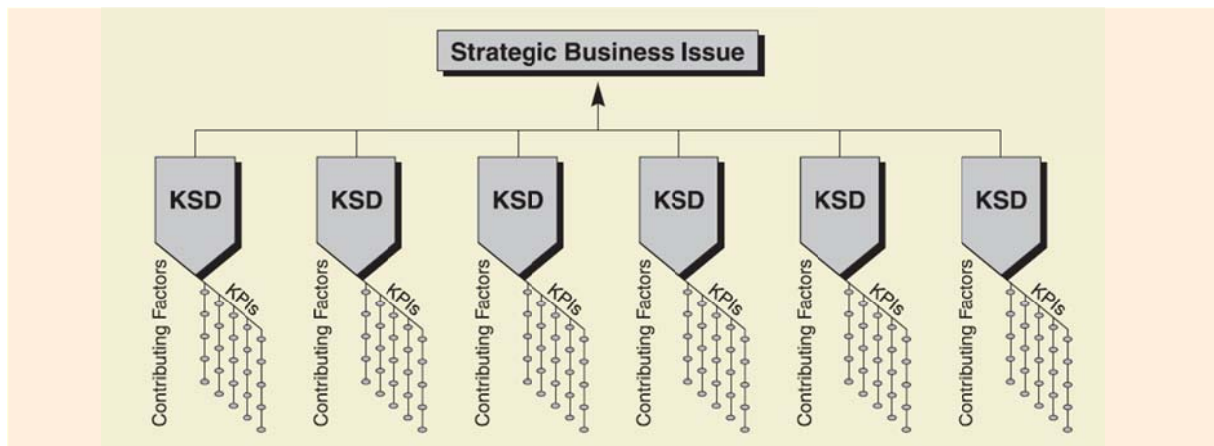


Figure 12 - Structure of the IDC maturity model (Duffy, 2001)

There are six domains in the IDC maturity model, explained hereafter.

HR organization and management

This domain refers to the human capital of an organization. It is key to attract, retain and manage an excellent workforce. Table 8 shows an example of the corresponding KPIs and contributing factors.

KSD	KPIs	Contributing Factors	Maturity Levels			
			1	2	3	4
HR Management and Organization	Attracting/ Retaining Right People	• Competency definition				•
		• Culture and empowerment			•	
		• Employee development		•		
		• Retention		•		
		• Job satisfaction		•		
	Environment	• Executive influence on e-business		•		
		• Perspective and wisdom	•			
		• Values		•		
		• Commitment	•			
	Executive Leadership	• Measurement		•		
		• Focus		•		
		• Enthusiasm				•
		• Ability				•
		• Judgment		•		
	HR Policies and Practices	• Balance		•		
		• Recruiting				•
		• Assimilation		•		
		• HR admin and systems		•		
	Organizational Effectiveness	• Motivation			•	
		• Metrics	•			
		• Agility, flexibility, adaptability		•		
		• Capabilities			•	
		• Management systems			•	
		• Decision processes		•		
		• Policies and standards			•	

Table 8 - HR organization and management domain overview of the IDC maturity model (Duffy, 2001)

Innovation and renewal strategy

Businesses need to react swiftly to market changes, if not so they will be displaced by more perceptive and responsive organizations. An important aspect is to verify how innovative the organization is and what processes are available to be certain about how present its knowledge and capabilities is.

Business and IT architecture

The business architecture represents how all entities (e.g. customers, suppliers, competitors) involved in the business environment of an organization interrelate. The IT architecture refers to the information and applications needed to support the business architecture.

Business/IT partnership

The role of IT in organizations has changed from a support role to a strategic partner. Technology is critical for the business to succeed and therefore this co-dependency drives the need for the IT and non-IT executive to pursue a win/win relationship.

Operational excellence

The author states that operational excellence requires an organization that recognizes the importance of learning, agility, partnerships and leadership and can respond to demands of the market in a timely way with superior results.

ROI strategy and management

This domain focuses on the measurement of IT costs and benefits. Since it is quite difficult to distinguish between IT costs and benefits using traditional metrics and processes, other metrics should be taken into account.

The maturity levels or also called development stages represent how business and IT see each other's value and existence. There are four stages. Level 1 uneasy alliance describes that IT is not understood by other functions of the organization and IT has little knowledge about how technology can add value to the business.

At level 2 supplier/consumer relationship, IT is still seen as a cost center and IT executives are not involved in corporate planning.

At level 3 co-dependence/grudging respect, the business depends on IT, there are early signs that IT is seen as a strategic partner and CEOs start to be aware of the competitive value IT can offer.

At level 4 united we succeed, divided we fail, business and IT are inextricably entwined and there is just one strategy which incorporates both business and IT. An overview of the maturity stages is given in figure 13.

Maturity Level One	Maturity Level Two	Maturity Level Three	Maturity Level Four
<i>Uneasy Alliance</i>	<i>Supplier/Consumer Relationship</i>	<i>Co-dependence/Grudging Respect</i>	<i>United we succeed, divided we fail</i>
In this stage, there is a fundamental disconnect between the technology executive and the rest of corporate management. IT responds to business demands with little understanding of how the technology can contribute to value. IT is viewed primarily as something to make the company more efficient. Business units have little understanding of technology and prefer to hold the IT organization accountable for the success and/or failure of any IT-related project.	In this stage, IT is still not viewed as a strategic tool, and IT executives are unlikely to be involved in developing corporate strategy. If IT has a strategic plan, it is developed in response to the corporate strategy. IT is probably viewed as a cost center, and there is little appreciation of the value that IT contributes to corporate success.	In this stage, the business is dependent on IT, and there are early signs of recognition that it is a strategic tool. CIOs are becoming more knowledgeable about cross-functional business processes because of ERP, CRM, etc. The Internet and interest in e-business force early IT/business alignment. CEOs begin to recognize that IT is a competitive tool.	In this stage, IT and business are inextricably entwined. Business executives have less time to prove that they can deliver. Business cannot continue without IT, and IT has little real value, if it is not to support the corporate strategy. There is only a single strategy, and it incorporates both IT and business. Whether the business is a pure play Internet company or a "bricks and clicks" company, IT and business move in lockstep.

Figure 13 - Maturity stages of the IDC maturity model (Duffy, 2001)

3.2.5 COBIT 5 - Process Capability Model

COBIT (Control Objectives for Information and Related Technology) is a framework that describes best practices for the management of IT (Information Systems Audit and Control Association (ISACA), 2012). The framework helps organizations to derive value from IT by maintaining a balance between realizing benefits and optimizing risk levels and resource use. It makes it possible to govern and manage IT in a holistic manner for the whole organization. In this, all business and IT functional areas of responsibility are taken into account. COBIT is developed by ISACA (ISACA: Information Systems Audit and Control Association) and the IT Governance Institute. Currently the latest version is COBIT 5. In addition to the previous edition, COBIT 5 has more attention for the value of IT for the business and risk management.

The following five key principles are at the center for COBIT 5:

- Principle 1: Meeting Stakeholder Needs
- Principle 2: Covering the Enterprise End-to-end
- Principle 3: Applying a Single, Integrated Framework
- Principle 4: Enabling a Holistic Approach
- Principle 5: Separating Governance From Management

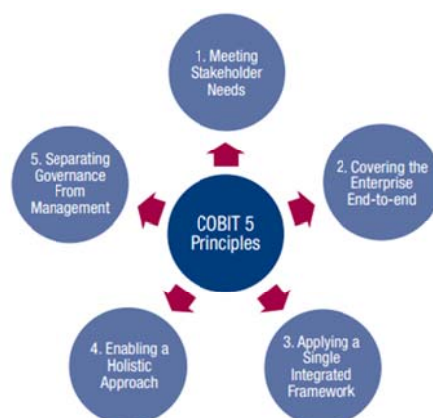


Figure 14 - Principles of COBIT 5 (Information Systems Audit and Control Association (ISACA), 2012)

A part of the COBIT 5 framework is the process capability model. This model is based on the ISO/IEC 15504 Software Engineering Process Assessment standard. The model facilitates the measuring of governance and management processes and it identifies areas that can be improved. Important to note is that the process capability model only gives insight regarding the state of processes. Processes are just one of the seven governance and management enablers. This means that the process assessment will not provide the full picture on the state of governance of an organization. For that reason the other six enablers need to be assessed as well.

The process capability model consists of six levels which a process can achieve. Figure 15 shows the outlay of the maturity levels. Level 0 incomplete process, the process is not implemented or fails to achieve its process purpose. At this level, there is little or no evidence of any systematic achievement of the process purpose.

Level 1 performed process, the implemented process achieves its process purpose.

Level 2 managed , the previously described performed process is now implemented in a managed fashion (planned, monitored and adjusted) and its work products are appropriately established, controlled and maintained.

Level 3 established process, the previously described managed process is now implemented using a defined process that is capable of achieving its process outcomes.

Level 4 predictable process, the previously described established process now operates within defined limits to achieve its process outcomes limits to achieve its process outcomes.

Level 5 optimizing process, the previously described predictable process is continuously improved to meet relevant current and projected business goals.

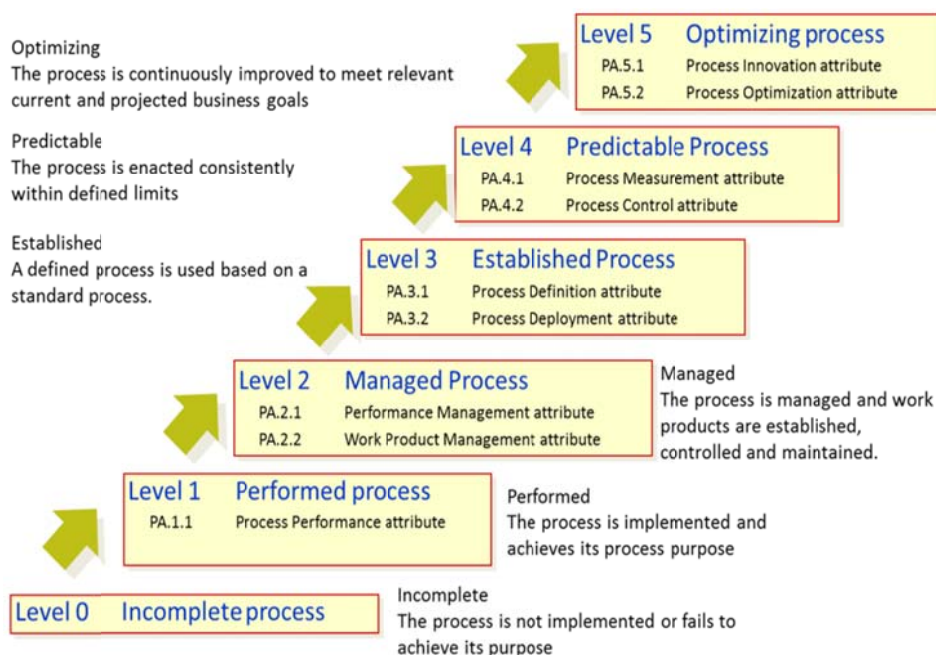


Figure 15 - Maturity levels of COBIT 5 (Information Systems Audit and Control Association (ISACA), 2012)

There are nine process capability attributes to determine the maturity of a process. These attributes are not domains, like in other maturity models, but they indicate improvements for assessed processes. The following list gives an overview of the process capability attributes:

- Process Performance

- Performance Management
- Work Product Management
- Process Definition
- Process Definition
- Process Deployment
- Process Measurement
- Process Control
- Process Innovation
- Process Optimization

3.3 Assessment maturity models

3.3.1 Overview of maturity models

In section 3.2 we discussed five different maturity models. In this section we will compare the studied models and look at their appropriateness as an IM MM for Capgemini. In table 9 an overview is given of the maturity models and their properties.

Maturity model	Levels	Focus (domains)
Strategic alignment maturity model (SAMM)	5	Communications, value, governance, partnership, scope and architecture, skills
Gartner Enterprise Information Management (EIM)	6	Awareness and adoption of IM in the organization
IBM Data Governance Council Maturity Model	5	Data and associated necessities
IDC maturity model	4	HR, innovation, architecture, partnership, operations, IT costs/benefits
COBIT 5 - Process Capability Model	6	Governance and management processes

Table 9 - Overview assessed maturity models including details

3.3.2 Assessment criteria

In chapter 2.4 we have seen what aspects are critical for BITA according to scholars. In chapter 4 we derive from interviews which areas are important for information management maturity. Combined from the previous two sources we take the following criteria into account when we compare the existing maturity models:

- Value
- Co-creation
- Agility
- Innovation
- Governance
- Project management
- Strategy/planning
- Understanding
- Partnership
- Communication
- Financial incentives

Strategic alignment maturity model (SAMM)

Luftman's model is the most comprehensive maturity model we examined. A majority of the defined assessment criteria can be found in the model. However we see that some aspects are underexposed if we take the practitioners' view into account. There should be more focus on agility and co-creation, these should not be just small aspects of a domain.

Gartner Enterprise Information Management (EIM)

As already experienced by Capgemini, the EIM model is primarily aimed at the role of EIM in the organization. Other than information there is not much attention for additional aspects in the model.

To be able to mature on IM, a maturity model should give more extensive focus points for an organization to look at.

IBM Data Governance Council Maturity Model

Just like the Gartner mode, the DG model is also mainly focused at data in the organization. This model is not sufficient to act as an integral IM maturity model.

IDC maturity model

Compared to the other models the IDC model has more consideration for business related domains. However in this model we miss the attention for agility and external partnerships.

COBIT 5 - Process Capability Model

COBIT 5 is an extensive framework that covers a lot of ground. The maturity model is about the maturity of governance and management processes. The framework might also look at other aspects but these are not to be found in the maturity model. Therefore we see the COBIT 5 maturity model as not sufficient enough.

3.3.3 Comparison

When comparing the maturity models, we see that similarities exist between the models. Although the exact name of the domains can be different, the specifics are equivalent. The most frequent domains are:

- Governance
- Partnership between business and IT
- Communication between business and IT
- Technology
- People

We consider the following domains, from the assessed models, useful for our maturity model:

Maturity model	Domains
Strategic alignment maturity model (SAMM)	Partnership, value, communications
IBM Data Governance Council Maturity Model	Value creation
IDC maturity model	Innovation and renewal strategy, business/IT partnership, ROI strategy and management

Table 10 - Relevant assessed maturity models

The above domains are specified in table 11 below:

Strategic alignment maturity model (SAMM)	Partnership: Business Perception of IT Value Role of IT in Strategic Business Planning Shared Goals, Risk, Rewards/Penalties IT Program Management Relationship/Trust Style Business Sponsor/Champion
---	---

	Value: IT Metrics Business Metrics Balanced Metrics Service Level Agreements Benchmarking Formal Assessments/Reviews Continuous Improvement Communications: Understanding of Business by IT Understanding of IT by Business Inter/Intra organizational learning Protocol Rigidity Knowledge Sharing Liaison(s) effectiveness
IBM Data Governance Council Maturity Model	Value creation: the process by which data assets are qualified and quantified to enable the business to maximize the value created by data assets.
IDC maturity model	<i>Specifics are not known</i>

Table 11 - Specifications of the domains from the relevant maturity models

Given the specifications of the above domains it can be noted that they could be significant for our maturity model. This means that the specific characteristics probably need to be present in the model. However the presence of specific characteristics depends on the usefulness of each of these characteristic for our maturity model.

4 First case study: with Capgemini practitioners

In this chapter we explain how we arrive at our proposal maturity model. We conduct interviews with practitioners from Capgemini and take those results plus the findings from the literature study into consideration. At the end we deliver a proposal model that will be further populated in the next case study, explained in chapter 5.

4.1 Capgemini expert interviews

Interviews with Capgemini practitioners have been conducted in order to explore the field of information management at Capgemini and their clients. Where literature can give certain insights on information management topics, conversations with people from the field can have different results since they have a practical approach and know what the current topics are in the business world.

4.1.1 Interview planning

We designed the interview study by following the qualitative case study guidelines of Yin (2013). The study is exploratory in the sense that while we reviewed literature to gain sensitivity of the terminology used in the field of our interest, we had no preconceived ideas about how information management and growth in information management are reasoned about and perceived from the perspective of those involved in the field.

The interview was planned by creating an interview guide. This guide can be found in appendix A. The interview guide was reviewed with a senior researcher, who was one of the academic supervisors on this project. Feedback by this researcher was collected and used to improve the questionnaire and finalize it.

4.1.2 Participants

The interviewees are 13 experts on the subject of information management and or business-IT alignment. The interviewees are employed as e.g. business analysts, architects and IT consultants. We interviewed practitioners from different divisions at Capgemini so we would yield a variety of views. This is usually desired in exploratory case studies where the researcher's goal is to collect as many perspectives as possible, so that as complete picture of a phenomenon as possible is developed (Daneva, Buglione & Herrmann, 2013). The question we asked were about understanding on IM by interviewee, completed projects, current hot topics regarding IM and their thoughts on essential aspects for IM maturity. A complete list of the interview questions can be found in appendix A.

4.1.3 Interview execution

All participating practitioners were interviewed by the researcher who is also the author of this thesis. Each interview took about 1 hour. The data collected were recorded and then typed by the researcher. The data analysis started shortly after the interview.

4.1.4 Data analysis

Each transcript was analyzed according to the topics we desired to gather more knowledge on. Primarily we focused on finding relevant and interesting domains for maturity measurement. We

coded text fragments for each interview so at the end we could compare the interview answers and decide what would be interesting for the study. In order to determine what would be interesting to study further we looked at answers that recurred several times. This was an indication that the topics were deemed relevant and important at this time by different experts.

4.2 Results

On the understanding of information management we found varying answers. Although the views are different in some cases there is an overlap and the general understanding on information management is the same. At client organizations the understanding of information management differs more according to the Capgemini experts. An explanation could be the maturity of information management in the organization. Organizations that have a lower maturity may perceive information management as less important and only deal with a certain aspect of the information management field. Another aspect that could be of relevance is the competence on improving information maturity.

The table below depicts the topics related to information management mentioned during the interviews, including the number of times mentioned. What can be seen is that most subjects relate to each other and some are high level whereas others are more precise.

	1	2	3	4	5
Business case	X	X	X		
Benefit tracking	X	X			
KPIs	X				
Innovation: creative thinking/skills/tools	X	X	X	X	
Speed; agility	X	X	X	X	X
Partnerships (internally and externally); service integration; chain	X	X	X	X	X
Governance	X	X			
Understanding of business processes	X	X			
Project portfolio management	X	X	X		
Technology/business opportunities	X	X	X	X	
Context IT organization: in-house/hybrid/outsourced	X				
Trust	X	X			
Political relations/interests	X	X	X		
Data management; putting information and data central	X	X			
Risk management	X				
Skills; persoonlijke effectiviteit vaardigheden; professionaliteit vak	X	X			
Awareness; Problem vs solution thinking	X	X			

Table 12 - Potential topics for the maturity model from Capgemini expert interviews

We made a selection of the topics in table 12 based on the grouping of equivalent themes and the number of times a topic was cited. The following list shows the results of our selection.

- Project portfolio management
- Value (KPI/business case/benefit tracking)
- Innovation (creative thinking/skills/tools; business/technology opportunities)
- Speed; agility
- Data management (putting information and data central)
- Political relations/interests
- Connected
- Partnerships (internally and externally; service integration; chain/awareness)
- Problem vs solution thinking; political relations/interests
- Skills (competence/expertise; personal efficiency)

The final selection is made together with members of the Capgemini IM project team. We looked at the most important topics according to literature and practitioners, the number of times a topic was mentioned, topics that were absent in other models and which areas probably would help organization improve their IM maturity. This resulted in the following four domains (VICA):

- Value
- Innovation
- Co-creation
- Agility

However, these four domains are not the only focus areas of the maturity model. The IM project members believe that the previous four domains will help organizations to improve their IM maturity. But there should only be consideration for the VICA domains when the fundamentals of the organization are well established. Otherwise the results will not be as expected or the situation will not be manageable for a longer period of time. The fundamentals can be found in governance, processes, people and technology.

Considering the found domains it can be said the model is twofold. One part involves governance, processes, people and technology that focuses on the fundamental of the organization. The second part consists of value, innovation, co-creation and agility. The structure and rational of the model will be explained in more detail in section 4.4.

4.3 Exploration of the VICA domains

The main focus area of the maturity model is on the VICA domains. Some aspects from these domains can be found in other maturity models but it may not be complete. Also, we found that in literature looking at information management from a VICA perspective is new. Existing models take some aspects of VICA into account but they do not cover the complete range. Therefore we conducted three exploratory interviews with members of the Capgemini IM project team to gather a view on the VICA domains and their possible associated characteristics. The results of these interviews will be the basis for the model and interviews with the clients of Capgemini, described in case study 2.

Below the results are given of the exploratory interviews. The results are plotted on a five level maturity scale.

Value

1. Island automation
2. Early concepts of steering group, project portfolio management and business case
3. Benefit tracking, start of programs and awareness of the chain
4. Integrated chain and trust
5. Embedded: look outside your own chain

Innovation

1. Isolated and quick innovations
2. Process innovation
3. Product and service innovations
4. Chain innovation and self-reflection (what is your right to exist)
5. Embedded innovations: mash-ups and self-realization

Co-creation

1. One-to-one collaboration
2. Collaboration based on hierarchy and authority
3. Collaboration becomes more humane and trust seems to be relevant
4. Integrated and linked: true collaboration
5. Reputation of the organization to the outside world

Agility

1. Chaos: value is insufficiently assured
2. Introduction of agile principles
3. Increase of agility: change of direction when necessary
4. Promotion of entrepreneurship within the organization
5. No distinction between business and IT, collaboration in multidisciplinary teams

The basis of the maturity model is based on governance, processes, people and technology. We describe them as follows:

Governance

- Decision making
- Organizational structure
- Responsibilities
- Business and IT strategy

Processes

- Standards
- Transparency of (end-to-end) processes

People

- Skills and competences
- Culture
- Knowledge
- Hiring and firing

Technology

- Infrastructure
- IT architecture
- Application landscape

4.4 Proposal model: The Dutch Windmill

As stated earlier the maturity model consists of two parts. First there is the basic component that should bring the fundamentals of an organization into order. After the fundamentals are well organized, the focus shifts to the VICA aspects that will further improve the organization. These two components of the maturity model can be translated into a windmill model. Hence the name of the maturity model: The Dutch Windmill. This section describes the structure of The Dutch Windmill and how the metaphor of a windmill suits the maturity model. Figure 16 below shows The Dutch Windmill.



Figure 16 - The Dutch Windmill metaphor

The pole

At the pole of the windmill you find the fundamentals: people, process, technology and governance. It is important that these aspects are well settled in the organization. So in order for the windmill to rotate its blades and generate energy, the pole has to be standing and stabilized.

The blades

When it is established that the fundamentals of the organization are in place and well structured, we can look at the next part: the blades of the windmill. There are four blades: value, innovation, co-creation and agility. Just like with the arrangement of the pole, it is important that each blade is in place and well structured. The blades need freedom to rotate. This means that every blade should get the same amount of attention and the opportunity to be working. It is critical that a blade is not pinned to the pole. This will lead to more concentration on that specific blade, for instance innovation, and the other blades, value, co-creation and agility, will receive less attention. At the end this could cause a windmill that does not rotate as well as it could, so less energy is generated. For an

organization this means that it is not running as smoothly as it could and eventually the other areas will become less existing and potential value could be missed.

4.5 Capgemini draft maturity model

As a result of previous interest from Capgemini in information management maturity models, a draft model has been developed to map their vision for a renewed maturity model. Table 13 shows the draft maturity model. A distinction has been made between the business and IT discipline. The business as well as the IT contains its specific characteristics for each maturity level. The information management field resides in between the business and IT area, in the model it is depicted as the role of an information manager. The information manager connects the business and IT worlds by adopting a different role. This manager's role is specific for each maturity level with related tasks such that it supports the business and IT in an optimal manner.

The Capgemini draft maturity model is part of the interviews with external practitioners. More details on that role are given in the next chapter.

Levels	0 Chaos	1 Bewustwording	2 Organiseren	3 Verbeteren	4 Strategisch	5 Aligned
Business	Automatiseren door vernieuwing mentaliteit Outsourcing reflex Noodzaak om pijn gaan voelen	Wil grip op secundaire processen Cost control Pijn omzetten in actie Draagvlak creeren	Grip op primaire processen BI Business Case Prioriteiten Cost reduction Governance Plannen en inrichten	Wil grip op tertiaire processen Compliance Security Agility Waarde BACC Compententies ontwikkelen	Bestaansrecht Heroverweging positionering en Business model SSC Keten Samenwerking	BPO
Informatie Manager	Capgemini Informatie Manager-ruit					
IT	Hands on Maatwerk Ad hoc	Data warehouse Applicatie rationalisatie Architectuur Pakketten	BI Document management Workflow Informatie architectuur	Enterprise architectuur ECM Cloud BPM(S) BRM Beheerbewust ontwikkelen	Keten-informatisering	Multi-sourcing

Table 13 - Capgemini draft IM maturity model

5 Second case study: with external practitioners

In this chapter we focus on the part where the VICA proposal maturity model is subjected to the opinion of field experts. We are interested in whether the VICA domains are relevant for the field and what the practitioners think will be the next step for their organization with regard to information management. First the case study methodology is described. After that the analysis process is clarified and explained how we arrive at the populated proposal model.

5.1 Methodology

5.1.1 The Evaluation Study

A qualitative study amongst different Capgemini's clients with interviews is conducted. The purpose of these interviews is to get the view of different organizations on how they are performing with regard to the VICA domains and their vision for the future. The set-up of the interviews is of an exploratory nature given that no specific characteristics are available for VICA in scientific literature. The results of the interviews should provide more insight into the several maturity levels on VICA.

This section describes the used method for the interviews. First the setting and sample of the study is clarified. After that the procedure is explained. Following the interview method is clarified which includes the interview topics. Finally the method of data analysis is specified.

5.1.2 Sample

The interview sample consists of several clients and relations of Capgemini. The participants are selected according to convenience sampling (Berg, 2004). Convenience sampling is defined as selecting participants who are close to the researcher or easy to approach for participation. A distinction is made between profit and nonprofit organizations such that there is a well-balanced sample which should result in a variation in insights and lead to a widely applicable maturity model. At these client organizations we are interested in information managers or people related to the information management field. These people are important since they are part of the information management team in their organization so are aware of the current affairs and have a view on the development of their field. A number of 17 persons is interviewed for the study. A detailed outline of the participating organizations is given in table 14 below.

Participant	Industry
P1	Education
P2	Public
P3	Retail
P4	Chemicals
P5	Public
P6	Electricity
P7	Higher education
P8	Financial
P9	Air control
P10	Law enforcement

P11	Lottery
P12	Logistics
P13	Parking
P14	Financial
P15	Airport
P16	Electricity

Table 14 - Overview participating organizations

5.1.3 Procedure

The conducted interviews are semi-structured because of the exploratory nature of the research. An interview roughly takes about one hour. An interview guide has been composed to depict the outlay of the meeting. Part of the interview guide are the topics to be discussed and prepared questions. In order to stimulate free and open answers the interview is based on the grouping of topics and questions. Which in this case are the VICA domains. The grouping allows new questions to be brought up and the tailoring of the interview to the context (Lindlof & Taylor, 2002).

The interview starts with a brief introduction of the research project and the purpose of the meeting. After that permission is asked to record the interview and consent for publishing the participant's name and corresponding organization. The first set of questions are asked to develop a general understanding of the interviewee and the position of information management at his organization. The following set of topics and questions are related to the VICA domains. At the end the participant is thanked for his cooperation and informed about the next steps and how he will receive the results of the study.

5.1.4 Interview topics

The main interview topics address the value, innovation, co-creation and agility domains. The questions are based on expert interviews in which VICA maturity characteristics are discussed. These obtained characteristics are the foundation for developing questions for the interview. Participants are encouraged to come forward with their own related ideas as this will lead to more profound results. A complete overview of the interview guide and questions can be found in appendix B.

5.1.5 Data analysis

The process of the interviews consists of a few steps. First a transcript is made of the recorded interview. A transcript is the reproduction of the audio recording as a written account using the actual words (Saunders, Lewis & Thornill, 2007). The second step is coding the transcripts. A code is a summative description for a portion of language-based or visual data (Saldana, 2009). The software program Atlas.ti is utilized to perform the coding on the transcripts. Atlas.ti is specific software that is well suited for coding large amounts of text in a structured fashion. Coding is done in the context of the VICA domains and according to the sub questions of the corresponding domains. The coding scheme will be explained in more detail in the next section.

5.2 Analysis

5.2.1 Coding

The analysis of the gathered and processed data is a meticulous process. The steps taken to arrive at the proposal model from the coded transcripts will be described next. The first step is to determine

the key concepts on which the codes are selected. Since there are over 800 different codes not every code can be taken into account. A selection is made based on the relevance and number of times a code has appeared. When a code is unique and cannot be directly related to the other codes, an exception is made when that certain code is believed to be significant and insightful.

5.2.2 Maturity groups

Prior to relating specific interviewed organizations or codes to a certain maturity level, a distinction is made amongst the sample. The participants are split in two groups: group A (the lower maturity group) for organizations with an estimated maturity level of 0, 1 or 2 and group B (the higher maturity group) for organizations with an estimated maturity level of 3, 4 or 5. Although we believe maturity level 5 has not been achieved by any participants, we see this as a future state and some particular aspects of this level may have been realized.

In order to classify the participating organizations we look at two determining elements. These elements are an indication for the maturity level for the organization. The first maturity indication is obtained from the Capgemini IM survey (Capgemini Nederland B.V., 2014). The maturity level in the Capgemini IM survey is based on the Gartner EIM model (Newman & Logan, 2008). This is a 5 level maturity model, more details can be found in Gartner's paper (Newman & Logan, 2008) or section 3.2.2 of this thesis. The second maturity indication is extracted from the interviews with the organizations itself. Each participant was questioned about their opinion of the overall IM maturity in the organization. The indication for the maturity level is based on a 5 level maturity model concept from Capgemini, explained in section 4.5.

Altogether there are two indicators depicting the maturity level of each participant. Taking both these maturity indicators into account we determine the appropriate maturity group. In table 15 below an overview is given of the participants, the two maturity indicators from their respective source and the corresponding maturity group for each participant.

Participant	Maturity level from Capgemini IM Survey	Maturity level from Master thesis interviews	Maturity Group
P5	2 high	1-2	A
P6	1 high	Unknown	A
P7	Unknown	1-2	A
P8	1 low	1-2	A
P9	Unknown	1	A
P10	2 low	2-3	A
P13	1 low	2	A
P16	1 low	2	A
P1	2 high	2-3	B
P2	Unknown	3-4	B
P3	Unknown	2-3	B
P4	3 high	3	B
P11	Unknown	3-4	B
P12	Unknown	2-3	B
P14	3 low	4	B

P15	3 low	4	B
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Table 15 - Classification maturity groups

The correct maturity group for a participant is based on the average maturity level from the two different sources. For instance, participant P5 has a maturity level of 2 high and 1-2. Taking these two values together we calculate the average maturity level as 2 ($2.5 + 1.5 / 2$). So the appropriate maturity group for this participant is group A. Two different sources for the maturity group determination are selected so it can be verified that the assumed maturity levels are accurate. This should result in a reliable classification of the maturity groups.

In a few instances there is only one source for determining the participants' maturity level and thus the appropriate maturity group. The reason being there is no other data source available to retrieve a maturity level. In these cases we make an educated guess for the right maturity group. As for the instances where there are two maturity level indicators, show that both indicators provide a proper average maturity level and thus maturity group. Given this phenomenon that each individual data source provides a correct prediction of the maturity group, we see no concern that for some of the instances there is just one data source available to determine the maturity group.

5.2.3 Main key characteristics

The final maturity model consists of four domains. Each domain is divided into smaller characteristics giving more meaning to the domain. This is also known as capabilities or process areas as explained in the literature study in chapter 2. We selected these main key characteristics for the model based on the Capgemini expert interviews, the client interview questions and answers and the coding of the client interview transcripts. We deem these key characteristics as important because they depict how organizations deal with each of the VICA domains. They also ensure that a distinction can be made, since several options relate to the characteristics, in the maturity of organizations.

The key characteristics define the maturity aspects of a domain. A key characteristic can have various ways to be populated. Each specific way correlates to a certain maturity level. When one takes all individual scores for the key characteristics into account, the overall maturity for the domain can be determined. In the tables below the main key concepts for each domain is given.

Key characteristics Value
Importance of IM according to IM manager
Importance of IM according to remainder of the organization
Determination of value: use of business case vs. who has the biggest mouth
Presence of business cases
Presence of benefit tracking
Presence of projectportfoliomangement and prioritizing
Importance of organization's presence in value chain

Table 16 - Key characteristics value

Key characteristics Innovation
Importance of innovation in organization
Role of IM with innovation
Type of innovation (Technology/(business)process/service and product/chain)
Aspects for being an innovative organization
Source of innovation inside the organization (IM/business/IT)
Speed of innovations
Presence of innovation with partners in the value chain

Table 17 - Key characteristics innovation

Key characteristics Co-creation
Presence of co-creation inside organization
Collaboration based on trust or hierarchy
Aspects for inter organizational co-creation

Table 18 - Key characteristics co-creation

Key characteristics Agility
Importance of agility for organization
Role of IM with agility
Organizational agility when organization changes or decision making
Presence agile project methods
Presence entrepreneurship within organization

Table 19 - Key characteristics agility

5.2.4 From codes to a model

In order to arrive at a model from the codes we group the codes into categories based on shared properties (Saldana, 2009). The first group is related to the two maturity groups we have defined. The codes go either in group A or group B. Then we group the codes according to the VICA domains. Finally we group the codes around the key characteristics of each domain.

For each key characteristic we review and compare the codes. At the end we define a value for the key characteristic which contains the content of all linked codes and depicts a correct representation of that key characteristic.

6 Results

In this chapter we present the findings from the interviews with external practitioners. The results are presented in the form of tables for each domain. We derived these results from processing the codes from the interview transcripts. The complete maturity model is presented in the last section of this chapter.

6.1 Results

In the tables below the results for each domain is shown and discussed. The results are given both for group A (the low maturity sample group) and group B (the high maturity sample group).

6.1.1 Value

Value key characteristics	Group A	Group B
Importance of IM according to IM manager	Important – quite important	Very important - crucial
Importance of IM according to remainder of the organization	Role of IM not clear within organization - important	Important – attitude on IM can be different throughout organization
Determination of value: use of business case vs. who has the biggest mouth	Both business case and biggest mouth; compliancy also has an influence	Business case; compliancy also has an influence
Presence of business cases	Present	Present
Presence of benefit tracking	Not present - limited	Limited – present; compliancy also has an influence
Presence of project portfolio management and prioritizing	Basics are present – need for further development	Present at different levels
Importance of organization's presence in value chain	Important (type of organization determines the importance)	Very important – crucial (right to exist)

Table 20 - Results value domain

Importance of IM according to IM manager

The importance of information management according the information management manager is important for both group A and B. Although for a group B organization information management is important in a way such that without it, day to day business will face difficulties.

Importance of IM according to remainder of the organization

The importance of information management according others in the organizations differs for both groups. For group A it is not always clear what the task is of the information manager of department. Sometimes information management is confused with the IT department or helpdesk. For group B the importance is seen, but the related tasks are not always clear as with group A.

Determination of value: use of business case vs. who has the biggest mouth

The determination of business projects' value or selection of projects is for group A a choice between business cases, compliancy or someone who has the "biggest mouth". For some organizations in group A it is not that strictly regulated to determine the project's value, which following determines also the go for the project. For organizations in group B, there is always a business case or a

compliance matter to determine the project's value and go. In one organization there was an exception when the project is seen as an innovative experiment. The business case is not the only influence on determining the go or no go. However after a certain period and first evaluation a protocol is followed to decide on the progress and continuation of the project.

Presence of business cases

In both groups business cases exist and are required. What can differ is the significance given to a business case and its format. Some organizations take more factors into account than others.

Presence of benefit tracking

Benefit tracking is a difficult and challenging topic for many organizations. This is mainly because it is a hard process and usually there is no interest from the higher management. In group A benefit tracking hardly occurs. In group B benefit tracking is limited. In some cases it is required for compliance issues.

Presence of project portfolio management and prioritizing

Project portfolio management is present in both group A and B. Organizations in group A have acquired a certain groundwork for project portfolio management and are taking steps to grow further on this matter. In group B portfolio management is existing on several levels, for instance globally and specific for a business group.

Importance of organization's presence in value chain

The importance of an organization's presence in a chain is usually determined by the type of organization. Organizations in maturity group B are generally really dependent on chain partners, it is a critical part of the value chain. In some instances chain collaboration is the right to existence.

6.1.2 Innovation

Innovation key characteristics	Group A	Group B
Importance of innovation in organization	Not really important - conservative organization	Very important
Role of IM with innovation	Supporting role – occasionally has something from own initiative	Supporting or leading role
Type of innovation (Technology/(business) process/service and product/chain)	Primarily technology, business process, service and product	No real distinction
Aspects for being an innovative organization	Presence of the right people with appropriate knowledge; support from top management	Fundamentals are in place; support from top management
Source of innovation inside the organization (IM/business/IT)	Primarily business or IM/IT - Increase of both business and IM/IT	Primarily business and support from IM/IT - both business and IM/IT
Speed of innovations	Slow	Relatively slow
Presence of innovation with partners in the value chain	Ad-hoc – primarily innovation with suppliers	Structured innovation

Table 21 - Results innovation domain

Importance of innovation in organization

The organization's attitude determines the importance of innovation in the organization. A conservative organization has no regulation for innovation. Most of these organizations are in group A. Organizations in group B perceive innovation as a more important part of their business. Sometimes this is even necessary due to tough competition. Different programs are available to stimulate innovation. For example, meetings with customers to get their feedback and vision for the future, and the pressure cooker method to develop new products or services in a short period of time.

Role of IM with innovation

For both group A and group B, information management has a supporting role in the case of innovation. However organizations in group B are more proactive and IM will recommend solutions when there are no specific questions from the business. Information management takes a more leading and proactive role. Group A is more of supporting role and on a rare occasion it will present a possible opportunity for innovation.

Type of innovation (Technology/(business)process/service and product/chain)

The existing type of innovation is different for each organization. What we can say is that each organization is subject to each kind of innovation. The difference between group A and B is chain innovation since group A has less focus on chain collaboration there is less attention for chain innovation compared to group B.

Aspects for being an innovative organization

In order to be an innovative organization we asked about aspects that influences the innovativeness of an organization. Organization from both groups answered the question in the same manner. Important aspects are having the right people with the knowledge in the correct position and support from higher management. It can be noted that although both groups are aware of the influencers on innovativeness, there still is a need for more innovation in some organizations.

Source of innovation inside the organization (IM/business/IT)

The source of innovation in an organization can be from information management, business, IT or a combination from the previously mentioned. We have seen that for both groups business is the main source of innovation. In group B there are more organizations that have a business and information management/IT combined source of innovation. In group A this combined source of innovation is seen as a next step.

Speed of innovations

Organization in both groups state that the speed or execution of an innovation takes a lot of time. Different factors influence this phenomenon and it is not easy to change it. Decision making is a factor that cost quite some time.

Presence of innovation with partners in the value chain

Innovation with chain partners is different for organizations in group A and B. In group A organizations are working on innovation with partners on an ad-hoc basis. An explanation is that there is not much focus on working together with other organizations to create value. Some organizations mentioned that innovations are every so often pushed from the supplier. In these cases the organizations cooperate to facilitate the innovation. In group B innovation with chain

partners is more structured. This structured cooperation for innovation may or may not be with suppliers.

6.1.3 Co-creation

Co-creation key characteristics	Group A	Group B
Presence of co-creation inside organization	co-creation internally project based; co-creation externally ad-hoc	co-creation internally structured; co-creation externally structured – multidisciplinary teams
Collaboration based on trust or hierarchy	Both trust and hierarchy	Trust
Aspects for inter organizational co-creation	Equality; knowledge sharing; familiar with each other's goals	Trust; mutual understanding; common interest

Table 22 - Results co-creation domain

Presence of co-creation inside organization

Co-creation is present in both groups. In group A external co-creation is on an ad-hoc basis, this can be related to innovation with chain partners in the innovation domain. Internal co-creation is project based. In group B co-creation is present with chain partners and customers in a structured way. Internal co-creation is executed in the form of multidisciplinary teams. Although the multidisciplinary teams are present in group A as well, it is more structured in group B.

Collaboration based on trust or hierarchy

In both groups trust is the fundament of working together with other chain partners. Without trust there cannot be a partnership. Trust should be present in the first stage of working together. In some cases there still exists an authority relationship between the partners because of responsibilities in a project.

Aspects for inter organizational co-creation

Organizations in both groups see the same important aspects for chain partnership. There should be trust and equality between partners, knowledge sharing and a common interest.

6.1.4 Agility

Agility key characteristics	Group A	Group B
Importance of agility for organization	Dependent on type of organization – public organization: agility is not that important. Private organization with focus on customers: agility is vital	Dependent on type of organization – public organization: agility is not that important. Private organization with focus on customers: agility is vital
Role of IM with agility	Focus on good architecture; processes well and efficiently present	Focus on increasing efficiency: demand management, documentation; flexibilisation of application landscape
Organizational agility when organization changes or decision making	Low agility	Dependent on type of organization

Presence agile project methods	Agile project methods are introduced	Agile project methods are established (where suitable)
Presence entrepreneurship within organization	Ad-hoc entrepreneurship	Encouragement for entrepreneurship

Table 23 - Results agility domain

Importance of agility for organization

The importance of agility in the organization is different for each organization in both groups. The importance depends on the branch of the organization. Organizations in the public sector allocate agility a lower priority compared to organizations in the private sector. Public organizations state that accuracy is more important than agility. On the other hand, private organizations will lose customers to competitors if they are left behind. In that case agility is of vital importance.

Role of IM with agility

In group A information management can assist in developing a good architecture. Not only an IT architecture but also a business architecture. The business processes should be well and efficiently designed. In group B a task of information management is to improve the efficiency of demand management. The cause for this is to get rid of the structured and documented way of demand management which is present in group A.

Organizational agility when organization changes or decision making

In general most organizations in both groups have difficulties with agility in decision making and course changes. Most organizations are large, have many layers and decision taking requires some time. This reduces the agility of quickly introducing changes. However there are some exceptions, for example when the organization is young, small or centralized.

Presence agile project methods

Agile project methods are well known in both groups but the existence differs. In group A organizations have made a start with agile project methods. In some cases there is no belief an agile project method will improve the way of working so a pilot program has been started. When the results are promising agile working is expanded. In group B organization are already convinced of working with agile project methods. Agile working is applied and introduced into more projects.

Presence entrepreneurship within organization

Entrepreneurship inside the organization is related to the amount of liberty one or a team gets to pursue activities that differs from mandated daily activities. In some way this can be related to innovation. We see that entrepreneurship inside organizations in group A exists on an ad-hoc basis. This corresponds with the conservative attitude with organizations in group A and low interest in innovation. In group B entrepreneurship is encouraged. Perhaps in these organizations it is better regulated and they are aware of the possible positive outcomes of inside entrepreneurship.

6.2 Future developments

We have asked the participating organizations about their vision for the development of information management in their organization. We are interested in the expected changes in the near future and their guesses for the long term. The found future developments are presented in the form of lists for each domain and from the perspective of maturity group A and B. These future developments can be perceived as recommendations for organizations to focus on in order to increase the maturity of information management in their organization.

6.2.1 Potential future developments Value

Group A

- Create value for the business with the use of IT: development of new businesses or digitizing existing processes
- Use of information plans including planning approved by the higher management
- Development from an information architecture perspective
- Work based on structured projects rather than ad-hoc solutions
- IT sourcing: subcontract or keep in-house?
- Improvement demand and supply relation
- Awareness on the value of IM for the organization
- No more: “who pays, who determines”
- IM advancement: BPM, risk management, data governance; start and advance functional management

Most organizations mentioned the desire to use IT to create some sort of value for the business. This could be developing new businesses in which IT plays an important part. Resulting from creating value with IT, the role of IT itself within the organization is questioned. Is it desired to keep IT in-house or would it be a better option to subcontract IT to another organization that can handle it more efficiently? The IT sourcing issue is a question related to this specific period of time. Organizations have to cut costs, which can be achieved by operating more efficiently or focusing only on the core business for instance. IT outsourcing can be a significant role in this.

A hot topic during the interviews was the demand and supply. This has been an issue which has existed with business and IT for a considerable period of time. For example IT complains that business delivers problems with their own solutions. The Information management department could be part of a solution to this phenomenon. Educate both business and IT and assign information management a more central role in this process.

The improvement of information management professionalism is an important priority. The improvement consists of several aspects. Perhaps most important is to establish a better position for information management in the organization. There should be more awareness created so the value of information management for the organization is clear. Also information management should be a fully partner to the business. The desire is to develop more structure for the information management related areas. Organizations have already started with for instance information plans or functional management, but these developments are in a beginning phase while it should be more organized.

Group B

- Predict the future with business intelligence
- Optimization of business processes to increase efficiency
- Redesign of governance: back to the basics and what is really important. Create more structure in the information supply
- More attention on customers: how to create value for the customer
- Thinking from an information perspective: understanding the value of information
- Change the way of working: small scale and short cycle. Shorter feedback loops with customers and decrease bureaucracy

Organizations in group B are dealing with the same topics as organizations in group A, but more on a strategically and advanced level. For instance to create value for the business more advanced techniques like business intelligence are utilized. Another frequently answer mentioned is business process redesign. In that matter IT is used to optimize existing processes to gain more efficiency.

Changing the focus or perspective of thinking is a point of interest. Organizations state going back to the basics: who and what are you? What is most important to you? You should start thinking from an information perspective. What is the value of information and how can you utilize it. The purpose of this change of thinking is to reduce unnecessary aspects that clutter the organization. The clutter distracts from what is vital for the organization.

The increasing attention for customers has been mentioned by several organizations. The customers are deemed to be more and more important. B2C organizations state that consumers have a large choice in the market and can easily chose for a competitor. B2B organizations state that partnerships are becoming more important such that partners receive prominent consideration.

6.2.2 Potential future developments Innovation

Group A

- Have time and money available for innovation
- Internal knowledge sharing
- Look outside your organization: learn from others
- IM innovation should be part of the information strategy
- IM acts as a coach: facilitate with innovation
- Increase knowledge of employees on IT and information skills to foster innovation on the workplace

Innovation is an important aspect for all the questioned organizations. The difference is the priority given to innovation within the organization. There should be possibilities for innovation so time and money should be available. Sharing knowledge within the organization is important for innovation. Different people from different departments should be teamed together to look at problems. From an external perspective organizations should look more outside their own scope for innovation. What is existing in the outside world that could be interesting for them. Organizations of interest are not only organizations within the same industry but they can also be active in other fields. Those organizations could have tackled similar problems you are having.

Information management could take a coaching role. In this role information management helps other departments to translate innovation into something more specific. What technologies can

achieve the innovation the people have in their minds for their tasks. The information management department is well informed about IT and the technologies where the other departments are experts on their business tasks. Giving information management a supportive/coaching role in the innovation process more innovation could be achieved.

In addition to the previous section, the best innovation occurs on the work floor. By educating these employees on IT and giving them information skills, they would be in a better state to innovate on their own tasks. Information management can support and facilitate this innovation process.

Group B

- Bring order to application landscape: disentangle and create links between web services
- Increase focus on core process
- IT sourcing: subcontract tertiary processes
- Common innovation map for entire organization
- More focus on contents rather than the process itself: fosters better innovation
- IM should be proactive: own initiatives on innovation

Organizations that are more mature are interested to focus more on core business activities. So understanding what your core business process is and how can information management support that. Part of this focus on the core process is to clean up the application landscape, clearing needless links and making new links between services. The question about IT sourcing is also part of this aim to focus more on core activities. Processes that are not part of your core business and other organizations could do cheaper and or better, are perhaps better outsourced.

For large organizations a common innovation road map can be an appealing method when working towards a big innovation. In this way different departments are involved in the process and they also have their own contribution for this big innovation project. The common innovation road map informs everyone in the organization what the future holds and what their specific role is. It creates an involved organization.

Information management could take a more pro-active approach towards the business. The information management department can propose activities that can help the business on their own initiative. It could also play a more important role when considering investments. In this way information management performs an active role on projectportfoliomanagement by giving advice on the possible future projects.

There should be more consideration for the business itself rather than the process from information management. This improves the possibilities to innovate because there is more knowledge of the business domain. Being aware of the complete business processes and how it all works makes you a fully and trustworthy business partner.

6.2.3 Potential future developments Co-creation

Group A

- Better understanding of your value chain: who is your partner and who is your supplier?
- Higher necessity to work with others: act against competition or innovational purposes
- IT sourcing together with other organizations
- A new foundation to facilitate partnerships between organizations without the bureaucracy

- Increase cooperation between global offices

Organizations feel there is a bigger need to cooperate with other organizations. Of course partnerships already exist but the next step is to precisely define this collaboration. You have to identify who your suppliers are and who your partners are. Some suppliers can also be your partners. For instance you can be innovating together or you can work together in order to cope with competing organizations. So defining the exact roles for your partnerships is important to foster the relation with your partners.

Large international organizations indicate they aim for more co-creation between different locations. There should be more centralization and standardization. This makes global control more manageable and creates better possibilities to compare geographical data.

A side effect of co-creation is the IT sourcing opportunity. When you can join other organizations and you all can together outsource common tasks that are not part of your core business, this can be more advantageous compared with IT sourcing on your own. So this is a possible next step when considering co-creation.

For some organizations co-creation with other organizations is not that easy feasible. So collaboration between different organizations should be found in some other way. Governmental organizations achieve this in the form of foundations. All involved parties are on the board of this foundation. The foundation facilitates letting different organizations work together in a convenient fashion. The purpose of this foundation is to operate and not to manage. This way of co-creation can be seen as a transition between less mature into more mature co-creation. In the business world this phenomenon can be compared with a joint venture.

Group B

- Increase co-creation in order to have higher efficiency
- More co-creation based on trust will lead to broader collaborations
- Advance co-creation: getting it done quicker and better
- Information supply open for partners
- More co-creation by grouping different people; do not think in departments, roles or organizations
- Internal co-creation should be bottom-up, not pushed down from the top

Co-creation with other organizations is still important and perhaps even becoming more important. The organizations are growing and developing so it is vital to become better in co-creation and doing it in a higher pace: bringing co-creation to a higher maturity. There should be more co-creation based on trust, a covenant. This would result in broader collaborations with organizations. The information supply chain should be directed on cooperation with other organizations and be easy accessible for them. It should be easier to share information with partners and perhaps even making this information also public. This would contribute to better co-creation since there is more trust between organizations: everyone is sharing information.

Organizations state about internal co-creation that different people should be grouped together. You should not think in specific departments, roles or organizations. People from different backgrounds create more and maybe better co-creation. When as an organization you would like to encourage co-

creation inside your company this should not be imposed from top management. It should be a bottom-up initiative coming from the people themselves. This can be established by creating opportunities for co-creation between different departments and informing about the value of this for the people and their work.

6.2.4 Potential future developments Agility

Group A

- Architecture is important for agility: improve business architecture and matching IT architecture
- Further introduce agile working according to agile project methods
- Flexibility increases when IT will be subcontracted in future
- Mapping and structuring business processes
- Decrease time to market
- Do not lose agility when IM will be further advanced

Business agility is an important aim for most businesses. A low time to market helps you to quickly react on market changes. When the time to market is high you will not have enough time to adapt your product to the current demand. Business agility is usually not an issue for start-ups or SME. It becomes a problem when organizations are growing quickly and becoming large. So in the process of maturing the organization, including the information management department, do not completely lose your agility. The business architecture and IT architecture largely determines the business agility. When the organization starts to grow this should be all in order. Otherwise when the organization is too large making adjustments to the business architecture or IT architecture will not be that obvious.

The business processes should be well mapped and structured. Optimization of processes and use of standards increases the agility of an organization. In the future when IT sourcing is a possibility the importance of agility is higher. For instance when working with readymade systems that could be configured by the information management department there should be more agility. The information management department together with the end user thinks about the configuration of the system. They do not wait until the user requirements known. This is also a form of working in multidisciplinary teams. A next step in the multidisciplinary working is DevOps.

Group B

- Get a firm foundation: systems in order, links working, modern technology and acceptable performance
- Information supply according to the needs of a specific person
- Integration of applications and movement to the cloud
- Innovation at the work floor: small teams innovating in an agile way
- Increase agile development

A trend in creating more agility organizations give more attention to the needs of a specific individual. The information supply is adjusted to a person and not a whole organization or department. Micro services are an example of this phenomenon. Only functions that are required in the software program are available for the user. With easily configurable systems the customizing for individuals is not a hard to accomplish. The fundament of the system should also be in order. The correct linkages between systems, modern technology and good performance are an important

matter. A next step with configurable systems is the integration of software applications. Different programs that are used by the same user could exchange services for example. Another point of attention is the use of the cloud. This is useful for more mature partnerships when organizations need to exchange data for or need to use the system of their partners.

Agile development is already existing in most organizations however this not always on a large scale. The next step is to introduce agile development to other parts of the organization and make it a common practice where it is appropriate. This agile way of working could also be applied for innovational purposes. With a small and diverse team making innovations in a short period of time is usually more rewarding than traditional methods. Especially in large organizations this approach is frequently taken, also known as the pressure cooker method.

6.3 Overview results

The complete model composed of the four domains is presented in the table below.

Value key characteristics	Group A	Group B
Importance of IM according to IM manager	Important – quite important	Very important - crucial
Importance of IM according to remainder of the organization	Role of IM not clear within organization - important	Important – attitude on IM can be different throughout organization
Determination of value: use of business case vs. who has the biggest mouth	Both business case and biggest mouth; compliancy also has an influence	Business case; compliancy also has an influence
Presence of business cases	Present	Present
Presence of benefit tracking	Not present - limited	Limited – present; compliancy also has an influence
Presence of projectportfoliomanagement and prioritizing	Basics are present – need for further development	Present at different levels
Importance of organization's presence in value chain	Important (type of organization determines the importance)	Very important – crucial (right to exist)
Innovation key characteristics	Group A	Group B
Importance of innovation in organization	Not really important - conservative organization	Very important
Role of IM with innovation	Supporting role – occasionally has something from own initiative	Supporting or leading role
Type of innovation (Technology/(business)process/service and product/chain)	Primarily technology, business process, service and product	No real distinction
Aspects for being an innovative organization	Presence of the right people with appropriate knowledge; support from top management	Fundamentals are in place; support from top management
Source of innovation inside the organization (IM/business/IT)	Primarily business or IM/IT - Increase of both business and IM/IT	Primarily business and support from IM/IT - both business and IM/IT
Speed of innovations	Slow	Relatively slow

Presence of innovation with partners in the value chain	Ad-hoc – primarily innovation with suppliers	Structured innovation
Co-creation key characteristics	Group A	Group B
Presence of co-creation inside organization	co-creation internally project based; co-creation externally ad-hoc	co-creation internally structured; co-creation externally structured – multidisciplinary teams
Collaboration based on trust or hierarchy	Both trust and hierarchy	Trust
Aspects for inter organizational co-creation	Equality; knowledge sharing; familiar with each other's goals	Trust; mutual understanding; common interest
Agility key characteristics	Group A	Group B
Importance of agility for organization	Dependent on type of organization – public organization: agility is not that important. Private organization with focus on customers: agility is vital	Dependent on type of organization – public organization: agility is not that important. Private organization with focus on customers: agility is vital
Role of IM with agility	Focus on good architecture; processes well and efficiently present	Focus on increasing efficiency: demand management, documentation; flexibilisation of application landscape
Organizational agility when organization changes or decision making	Low agility	Dependent on type of organization
Presence agile project methods	Agile project methods are introduced	Agile project methods are established (where suitable)
Presence entrepreneurship within organization	Ad-hoc entrepreneurship	Encouragement for entrepreneurship

Table 24 - VICA maturity model

7 Evaluation

The goal of this evaluation chapter is to answer the question of the extent to which the delivered domains and key characteristics can be of use for the practitioners. Evaluating this question is an important part of systematic research on any maturity model. Our evaluation consists of two parts. The first part is a focus group that reviews the fundamentals of the VICA model, the structure and its domains. The second part is a walkthrough of the VICA model with a Capgemini expert who gives his opinion on the model and its usefulness.

7.1 Focus group

We organized a focus group (Krueger & Casey, 2008) for Capgemini experts who also participated in the exploratory interviews. The aim of the focus group meeting was to present the results of the research until this point and to get feedback for the following steps in the research. The focus group research method was chosen because of its applicability to our research context and its cost-effectiveness (Daneva, 2015). The focus group was designed by using the guidelines of Krueger and Casey (2008). It included six participants and took two hours. The author of this thesis served as the moderator.

The meeting started with a general presentation about the research and its design. During this presentation several topics were treated and discussed with the aim of participants giving their opinion. In the next sections these topics and the related discussion are summarized.

7.1.1 The definition of Information Management

The participants started with a discussion on the several definitions that exist on information management. One participant notes that he thinks the definition is different when you talk about information management from a practical or research perspective. "When you talk to a CIO the explanation of information management should be tangible and relate to difficulties an organization could suffer. This makes information management recognizable and shows what the benefit could be for an organization. From a research perspective the definition of information management should be comprehensive and clear. There should be an understandable distinction with other research fields like business-IT alignment." Another participant remarks: "explaining information management remains difficult. Using business-IT alignment is much clearer to me." All the participants agree on the next statement of a participant: "I think in addition to business-IT alignment you should also add the part of information as a business resource. A component of information management is organizing: how do you manage your business and IT relation linked to your information supply."

Some organizations in the Netherlands see information management as the cross point of business (the organizational part of an organization) and IT (the IT department of an organization). Outside of the Netherlands information management is perceived only as dealing with information as a business resource. The function of business-IT alignment does not exist in that understanding.

Thus some confusion may exist about the meaning of information management in the Netherlands, since we use a combination of information management (the international definition) and business IT alignment. For the present research we will continue to use the combined definition on information management. A clear definition will be stated so there will not exist any confusion about the meaning of the subject.

7.1.2 The VICA domains

The underlying idea behind the VICA domains is to make a shift from the more traditional topics like people, process, technology and governance into something more renewing. The VICA perspective should give a different and hopefully a better view on information management matters. With this renewed view it is expected to make better analyses of an organization and corresponding recommendations for improvement. The six participants agree the presented VICA domains are relevant. However some of the domains are interrelated. A participant asks: “should they all coexist or would it be more logical to combine some of the domains?” From the results we indeed see that the domains are in some way intertwined. Each domain has a specific focus area that is aimed for improvement. Although the key characteristics may intertwine, the main purpose of the domain may be different. For example, innovation and co-creation; you can innovate with partners to achieve greater innovations, but this is also a form of co-creation. Thus at this point no domains are combined or excluded.

A participant comments that in his opinion “the domains are not complete, though it may be complete for others.” He has to think of other domains to make the model work. Another participant replied on this by “it is not simple to create a model which takes all domains and key characteristics into a coherent model.” Developing a new model is a long process. Adjustments and improvements are made along the way. At the end the result is a model with probably complete and relevant domains. Four of six participants agree that the domains are complete up to this point.

Remarks are made on the relation between the domains and information management. A participant notes: “it is not always clear what the explicit role is of information management. Some of the terms are applicable to other phenomena as well and thus are not information management specific.” The role of the information management function is not the same in every organization. As we have seen in the interviews with organizations this can vary substantially. In our opinion an extension can be made for the typical tasks information management has. Being more proactive and thinking along with the business should be a benefit for the whole organization. By paying attention on topics that may not be specific for information management you still can improve the maturity of information management in general.

7.1.3 The Dutch Windmill as a metaphor for the VICA model

As indicated in Chapter 4, the Dutch Windmill was proposed to be the metaphor for the VICA model. The VICA model consists of the blades of the windmill. The blades can only be reached when the pole is present. The pole is composed of the well-known themes like people, process, technology and governance. When the pole is present and stable one can start on the blades: the VICA model.

A participant asks: “is it still applicable to this day and time that the pole and blades are separated?” He thinks that the blades are constructed together with the pole and also grows along with the organization. The focus of the present research is on organizations that have the themes from the pole in place. That pole may or may not be completely well built, but a good fundament is needed before the focus shifts to the blades. The blades aid in developing the organization by improving information management maturity and indicating what themes are relevant for that case. Other participants agree that the concept of a parted pole and blades is more applicable to existent and established organizations.

A participant remarks about the chosen metaphor: “why have you chosen a windmill as a metaphor? The windmill is rather outdated and would a drone for example not be more appealing and speaking to the imagination? The drone could have four rotor blades, the VICA domains, and hover around themes that are relevant for information management in the organization at a specific moment in time.” We agree a drone is more versatile however an important aspect of the windmill is the existing and needed stability of the pole. Without this solid foundation large organizations are not able to grow in a structured fashion.

7.1.4 Discussion on the findings of the focus group

As the results indicated, the participants partly confirmed the completeness of the domains. Two participants stated more domains are needed to have a complete view on information management maturity. The relevance for the domains is confirmed. Although some domains are intertwined in a certain way, we keep them separated in this research. A consensus was found on the definition of information management. It includes a technical part of the international understanding of information management and an organizational part, the business side. No consensus was found on the Dutch Windmill concept. The idea that the pole and blades are separated, meaning first a stable pole and then focus on the blades, is not supported by everyone. Including the incomplete reach from the domains, for one participant the Dutch Windmill concept would not work. The other participants do not reject the concept immediately. More research is needed to validate the model.

While the focus of this research is on existent and established organizations we found clear indications that the VICA model is not relevant to start-up companies for example. Usually start-ups operate according to most of the VICA domains. Being innovative, agile, working together with others and creating value is important for start-ups. These are key aspects for a starting company to evolve. Established organizations that are seeking for agility and innovation may benefit more from the VICA maturity model. When the fundamentals are in place the VICA model offers guidance on improving the VICA related areas.

The conducted focus group evaluation study has some limitations (Krueger & Casey, 2008). First of all it is a single focus group and as methodologists suggest, multiple focus groups with a broader diversity of practitioners would have provided stronger evidence to substantiate the claims made in the previous sections. However given the resources we have available, it was not feasible to organize multiple focus groups. To mitigate the threat to validity due to this situation, we set up a follow up in-depth interview study that included a walkthrough with one practitioner. The results of this walkthrough interview are presented in the next section.

7.2 Walk through interview

A number of questions have been asked to an information management expert from Capgemini. The questions concern the contents of the VICA model and its applicability in the field. In the next section the questions and related answers are specified.

1) As an IM expert, would you see yourself using the VICA model or certain aspects from it?

The interviewee indicated: “I definitely think there are useful parts in the model. The two maturity groups are clearly stated. In some cases you do not see big difference between the two groups while in others the differences are very clear. “

With regard to giving recommendations to organizations on what steps to take next the interviewee says the following: “an organization can be positioned in one of the two groups

based on the key characteristics of the domains, that is manageable to do. What is not clear in the model is the next step after determining in which maturity group an organization is situated. It would be my own interpretation and experience to advise organizations on what actions to take.” The current model does not give recommendations on how to reach a more mature next level. Since this is an exploratory research we think it is not justified to give recommendations while more in depth research and validations are needed.

The expert recommends to create an abstract and simplified version of the current model so an organization can be easily positioned in a maturity group based on some observations. At this point it would be manageable but it is not that easy to achieve.

2) Do you think the VICA domains are complete?

The interviewee confirmed: “I think so. Of course there is more but that does not mean that what is stated here is incorrect. From your research perspective you of course also have a scope to focus on.”

On the specific domains he says the following: “I think many of these topics are relevant. Value: what does a project yield for the business, how do you make that measurable and how do you make that data comprehensible at the end of the project. This allows you to show that the project actually did create value. I see that this is a current topic within information management. The same is true for innovation. Co-creation is still in its infancy but you see organizations are willing to work with other organizations. They are somewhat also forced to work together considering the political acts taken lately. For instance health care is completely being changed. Agility is a typical way of working at this moment of time.”

Possible other domains that could be added the interviewee says: “when you look at topics that are missing or you could still think of, I think those would be the more traditional business-IT alignment topics. A lot of research has been conducted on these kind of topics.”

Final words on completeness: “I think these four domains are complete and current at this time. There surely are more topics that could be added to the model but you have argued why you have chosen for these four topics.” According to the expert the domains are complete for this research but it is most likely there are more domains that can complement the model.

3) Do you think the VICA domains are relevant?

The interviewee replies: “I am certain it is. I think co-creation will become more relevant. In the interview results you can see that the interviewees do not have a good idea on that topic. I think co-creation will become more important and present in organizations. For example you see partnerships between organizations to optimize their service. In the public market you see this as a result of political decision making, for instance the health industry like I explained in the last question. But co-creation is also interesting for private organizations. You see partnerships arising. I think organizations want to focus on their strengths. Things that are not part of their core business can be subcontracted or divided amongst partner organizations.”

At this moment the domains of the model are relevant. But as the expert indicates time has influence on the relevancy of the specific domains. Thus we cannot say it is a timeless model that can always be applied. It would be necessary to adapt the model to the current market and developments of the industry.

4) Do you think the key characteristics to each domain are complete?

The interviewee answers: "I think that is difficult to say. You started with some expert interviews and then you did interviews with organizations to determine these key characteristics. I would not say they are 100% complete since you cannot do research and take everything into account. But at this point I do not have the feeling I am missing some characteristics."

Here we can say the same as with the completeness of the domains. At this point for the research the key characteristics but there certainly are more key characteristics to be added with further research.

5) Do you think the key characteristics to each domain are relevant?

The expert replies: "they all originate from the practical field so yes I think they are all relevant. I do not think they will always be relevant though. For instance the importance of information management according to the information manager, eventually it will be accepted that it is important. Thus that characteristic will not be relevant anymore then. But time will tell if this will be the case."

On co-creation the expert says the following: "I think regarding co-creation the key characteristics will increase when that domain grows. You can see the interviewees do not say that much about co-creation. So I would think that domain still can grow and deliver relevant characteristics. The lack of vision on co-creation can indicate that it may grow more or on the contrary that it may diminish completely. This would make it on the long term not relevant at all. Only time can tell."

About the agility domain the following is said: "Agility is really relevant at this moment. Especially when you look at the public market and the changes they are expecting. It is very important to adapt your information supply on those changes in a very short period of time. So perhaps in the future the key characteristics can evolve on that topic."

According to the expert the key characteristic are all relevant themes he thinks. He states: "otherwise you would also have gotten some respond on that during the interviews with the organizations." As the expert indicated on the relevancy of the domains, the key characteristic are also subjected to the current time. It is necessary to keep them in line with development on the market. Otherwise the model will be outdated.

6) Do you think the VICA model could be applicable or assist in aiding organizations to further develop their IM maturity?

The interviewee confirms: "yes I really think so. I think the model is a framework that can be offered to a client and show where they are positioned at this moment and what the possible near future could be for them. The next question would be what steps to take to get to that future. But this model can certainly contribute in the development of IM maturity."

7) Do you think the VICA model is sustainable? Or is it necessary to update the model's content in the near future?

The interviewee replies: "I think if you look at the structure of the model itself it is sustainable for a longer time. If look at the specifics of the domains I think that will develop quickly. For example we see that agile working is becoming more popular. At a certain point in time that will be a standard and the field will be different. As a consequence the theme in

the model will have to be adapted. So in that sense I think it will have to change. But the conceptual idea of the model and the way it looks at information management can be used for a longer time into the future.”

The interviewee adds: “eventually when there is a perfect business-IT alignment it may become obsolete. But it has been over 40 years that research is conducted on that field and it still is continuing. So it will take some time to get there. However continuous research is needed to keep the model up to date and relevant for the practical field.”

As stated in earlier answers by the expert, the model is subjected to changes in the field. Developments are going quickly and the focus is moved when possible. So key is to keep the model up to date with the market. It would probably be required to do this on a regular basis. Otherwise you would be lagging behind and prove the model useless.

8) What would you see as areas for improvement or consideration in future research?

The interviewee answers: “I would like to see the model being validated on a large scale, a quantitative research at several organizations. You have done an exploratory research and distinguished two maturity groups. I think a next step would be to refine the model into more maturity levels by performing case studies at organizations to establish this. A model where an organization can be positioned exactly and necessary tasks are given in order to mature is something I would like to have eventually.” The expert looks for a model that is validated and proven to be relevant for the field. The eventual model should seamlessly position an organization on the maturity scale and matching recommendations are given so growth is achievable.

7.3 Reflection from the evaluation sessions

The two evaluation sessions have given us insight on how the practical field perceives the VICA model. In the focus group we had good discussions about information management itself and how it can be best defined for the use of the model. We talked about the structure of the model and whether it contains the correct components. In the walk through interview the focus was on the applicability of the model in the field.

Given the practitioners' perceptions of the proposed model we can say that the model can be useful for the practical field. Organizations can be positioned in a low or high maturity group with the use of the model. Deciding what the next step is to improve the maturity is missing at the moment. This would have to be the consultant's own interpretation.

The shift from the typical themes around information management towards the VICA domains is accepted. However, to determine the completeness and relevance of the domains and key characteristics more in depth research is needed. At this point there is no consensus on the completeness of the model. The domains in the model are relevant but we cannot say that the important aspects of information management maturity are all covered at this moment. Some domains are more detailed than others which is related to interviewees' experience on that specific theme.

The present research is of exploratory nature. In this we have made a shift to a renewing view on information management maturity. Further research is needed to quantitatively validate these

findings and complement with new data from case studies. The outcomes of the evaluation sessions will be used as recommendation for future work.

7.4 Reflection on generalizability of the results beyond the setting

Although we cannot claim universal generalizability of our research results to other contexts, research methodologists (Wieringa, 2014, Seddon & Scheppers, 2012, Wieringa & Daneva, 2014) suggest that if we observe a phenomenon in one particular context, it might be well possible to observe the same phenomenon in similar organizations that share some similarity of context with our case study organization. For example other consulting companies that operate in the same market. These other companies serve a similar client base and are driven by the same corporate values. They have a need to offer their clients a contemporary maturity model in order to grow their organization.

The interviews with the organizations have been performed on a variety of different public and private organizations. Each of these organizations could also be a client to other similar consulting organizations, yielding equivalent interview results. The research phase in which we interviewed Capgemini information management experts could also have been conducted with other information management experts at different companies. The Capgemini experts have a varying background and work in the field of business and IT, information management. These experts have gathered their experience at many different client organizations. Each of these client organizations are also clients of several other consulting companies. This means that the Capgemini information management experts do not have a privilege on the experience with these organizations and their gained knowledge from their projects at these organizations. Also, these kind of experts can be found as well at other similar consulting companies. Thus, when we would perform the research at a different consulting company we would have comparable research results.

8 Discussion

In this chapter we reflect on the findings presented in the results chapter. We discuss about the implications of the research outcomes for the scientific field and the practical field. Also we explain what recommendations can be given to field experts and what the relevance is for academia. Furthermore we argue about the limitations of the conducted research and the recommendations for future research.

8.1 Scientific relevance

In the following table we compare the VICA model to other maturity models examined in the literature study in chapter 3.

Maturity model	VICA (The Dutch Windmill)	Strategic alignment maturity model (Luftman, 2003)	Gartner Enterprise Information Management (Newman & Logan, 2008)	IBM Data Governance Council Maturity Model (IBM Data Governance Council Maturity Model, 2007)	IDC maturity model (Duffy, 2001)	COBIT 5 - Process Capability Model (Information Systems Audit and Control Association (ISACA), 2012)
Maturity levels	5	5	6	5	4	6
Domains	Value, Innovation, Co-creation, Agility	Communications, Value, Governance, Partnership, Scope and architecture, Skills	Awareness and adoption of IM in the organization	Data and associated necessities	HR, Innovation, Architecture, Partnership, Operations, IT costs/benefits	Governance and management processes

Table 25 - Overview assessed maturity models in the literature study

In table 24, we can see that number of maturity levels of the VICA model is in the same range as the other maturity models. Although we have made a distinction for now between low and high maturity groups, our aim was a maturity model with 5 maturity levels. We have chosen for a 5 level maturity model since it is a common feature of the CMMI standard. Also given that most assessed maturity models have 5 levels or more, we assume that the 5 levels are sufficient for now. With further research on the domains and key characteristics such that a better distinction can be made between the current two maturity groups, there could be indications that 5 levels will not suffice. At this point we do not have enough foundation and take the 5 maturity levels as a guideline.

Each of the VICA domains can be traced back to the other maturity models. Aspects of the value domain in VICA can be found in the Strategic alignment maturity model (SAMM), the Gartner Enterprise Information Management (EIM) and the IDC maturity model. In contrast to this, the innovation domain can only be found as a specific domain in the IDC maturity model, while the other models in table 24 do not consider innovation as a key domain. Also, we observe that co-creation can

be found in the Strategic alignment maturity model (SAMM) and the IDC maturity model under the domain partnership. However, in the VICA model co-creation is associated with both internal and external collaboration whereas the other maturity models only consider internal partnership between business and IT. It is worthwhile noting that the domain agility cannot be found directly in any other maturity model among those in table 24. In our opinion, agility is important for business and should be considered as a stand-alone domain. A frequently heard comment during the interviews with participants is the long time to market. It takes a lot of time to finish a project start or even start one. The market around most organizations is dynamic and customers are demanding. Thus agility should be present and considered when organizations are progressing in maturity.

The VICA maturity model consists of domains that can also be found in other models. However in the VICA model a combination of domains is presented that is not provided in the existing models, where the domain agility is not even present. With the VICA maturity model, we intended to be innovative and change the focus. We looked for domains and characteristics that are relevant in this present time and benefit business in general.

With a fairly young field and no extensive scientific literature available on information management, the process of developing the VICA model was in fact a process in which we have explored the field itself. The domains and characteristics we have found matter to organizations at the present time. The domains can be extended and the characteristics can be elaborated, if future times create new business environments in which new domains might be also relevant. We have also looked at near future developments for the information management field, for example the IT sourcing question and being an equal partner to the business. These developments can be taken into account for future research. Are the developments a plausible next step in maturing and how do organizations implement them? These questions are interesting for further research.

8.2 Practical recommendations for field experts

The practitioners in the field can use the VICA model to get a first estimation on their information management maturity. The output of a low or high maturity level will deliver corresponding aspects that should be present. The possible future developments for each domain also show what aspects the organization can focus on in the near future.

Based on the challenges organizations face regarding the information management maturity they can look for services that are offered by companies like Capgemini. The VICA model is a model that ignites the conversation about the information management position and maturity in an organization. By talking about the current situation solutions can be found and perhaps be implemented as well.

8.3 Relevance for the industry

It is the understanding of the author of this thesis that other companies in the same industry as Capgemini can also benefit from this research. Companies can start offering services that help organizations to mature in regard to information management. This can be focused on a specific domain or can be broader and thus cover on several domains. For each domain the characteristics indicate the concerns and improvements. Also based on the feature development client services can be derived.

The conducted research shows that the field is still young and in development. No consensus exists on a definition for information management. It is therefore well possible that in one organization, information management can be more comprehensive than in another organization. The responsibilities of the information management department can differ and also the awareness on the usefulness of information management in the rest of the organizations may not be on the right level everywhere. For example, as we mentioned earlier, we observed that in some cases information management is still seen as a part of IT.

8.4 Limitations

For the conducted research there are some remarks to be made. First of all, the research is of an exploratory nature. This means a first approach has been taken to develop an information management maturity model that is different compared to existing models with a focus on (fragmented) other aspects. More in-depth research is therefore needed to deliver a solid maturity model.

The fundamentals of the maturity model have been set. The different domains, characteristics and a rough classification of the maturity levels are presented. Due to convenience sampling (Berg, 2004) there may be some implications for the results. First, as we used a qualitative interview-based research approach, there is no quantitative validation of the gathered and analyzed data. Of course, as Berg (2004) indicates this is a common feature of conducting qualitative research but it could imply for instance that some of the results are not applicable for every organization. In our research sample all participants are large corporate or governmental organizations, no SME or start-ups participated in the research. Thus the results and the model are based on large organizations and may not be generalizable to SME or start-up organizations. However, following case study research methodologists, e.g. Seddon and Scheppers (2012), while we cannot claim universal generalizability, we do think that it might well be possible to observe findings similar to ours in organizations that have similar contexts to those of our case study participating organizations. As these authors indicate (Seddon and Scheppers, 2012, page 12), “if the forces within an organization that drove the observed behavior are likely to exist in other organizations, it is likely that those other organizations, too will exhibit similar behavior”. We therefore think that our findings might apply to large corporate and governmental organizations that launch information management initiatives and are motivated to assess their growth level and potentials for the future.

Another consequence of convenience sampling is the large amount of different organizations participating in the research. For example among others there are governmental, educational and financial organizations that participated. While we did consider this as a well-justified choice for designing our research process (as it provides us with a broad range of perspectives), at the same time we are aware that there may exist industry differences on the interpretation and application of information management. It could be possible that some industries do not follow the same growth steps, so a terminology on a general maturity model could be difficult to agree upon. During the interviews we also experienced that there is a considerably difference between public and private organizations. Of course, the missions of these organizations differ, e.g. one has to serve the citizens while the other is maximizing profitability, but this is also expressed in the focus and priorities of information management. We can also see differences between B2C and B2B organizations.

The perception of a participant could also differ regarding their knowledge of each participating organization. Sometimes the interviewee was a head information manager who is in charge of all other information managers, but we also conducted interviews with information managers that are part of a specific department and did not have much knowledge about other parts of the organization. This could have an influence on the given answers and may have also impacted the comparability of the data.

8.5 Future research

This master project has some implications for future research. First, regarding the used methodology, and second – regarding the latitude of the research. Clearly, a larger and more diverse sample of participating organizations will give a better view on what really matters in an information management maturity model. As we already noted differences exist between industries regarding the conception of information management and the way it is executed. So a significant sample with ample participants from different industries should give more assurance on the results and better understanding for all industries.

During the interviews with participants we have spoken to people with different functions. One participant could be the lead information manager whereas the other participant is an assistant information manager for a department. This can have an influence on the given answers of participants and change the perception we have of the organization. For future research we recommend to interview two or three different people from the organization who have a clear view of the whole organization with regard to their field and know what is going on.

As an addition to a better and more reliable maturity model, there should also be a quantitative research part. Each domain and characteristic should be tested for its significance. In the present research we have taken the judgment of a few experts to select the domains and the associated characteristics. The domains and characteristics we have found can be correct but it is also possible that some characteristics are not significant enough to be part of the maturity model and thus not relevant. With quantitative data we can be certain about the reliability of the gathered data to construct the maturity model.

In the phase of determining the fundamentals of our maturity model we have taken the opinion of a small group of experts to select the domains and characteristics. This was done due to time constraints. We would recommend talking to more experts and going back to experts for feedback. Also one could organize several focus groups with experts so they can discuss and give their opinion on what domains they see as important. The same applies to the process for determining the key characteristics. Our experience on the absence of recent and relevant scientific literature on domains and characteristics makes talking to experts more important. Talking to a larger group of experts (and information managers) could give a better understanding of the whole field of information management and input for the model.

In our maturity model we have made a distinction between two groups: low maturity and high maturity. This corresponds to a 5 level maturity scale: with level 1 and 2 for low maturity and level 3 and 4 for high maturity. The reason for this high level distinction is because of the uncertainty we had about the maturity of the participating organizations. We could not determine whether an organization would fit exactly at maturity level 1, 2, 3, 4 or 5. There was no external test or data available that we could use in order to verify and place an organization at a specific maturity level.

For future research we would recommend to find a method to determine beforehand the exact maturity level with regard to information management so a significant sample can be composed.

Since information management is quite a young field it is still growing and developing. We have seen some less mature organizations and organizations that are more mature than others. But have not witnessed organizations that are far more mature than other organizations. The final maturity level and the end goal for some organizations to accomplish is not crystal clear yet. During interviews with participants we have talked about this. Some thoughts are that information management will eventually dissolve. However this is far in the future and at this point we can only imagine and debate what maturity level 5 would look like.

9 Conclusion

In this final chapter we answer the central research questions drawn at the start of the present research. This is followed by a discussion on the contributions and their implications for research and practice, and by recommendations for Capgemini.

9.1 Research purpose

At the start of the present research the aim was to find a framework which made it possible to map the maturity of information management inside an organization. We translated this into the following main research question:

➤ ***What is the appropriate information management maturity model for Capgemini?***

In order to answer the research question we have taken several steps. First we started with a literature study in chapter 2 and 3. The purpose was to get an understanding of the research field and the current state.

We found that business IT alignment concerns the application of appropriate IT in situations in a timely way and that these actions stay congruent with the business strategy, goals and needs (Luftman and Brier, 1999). Over four decades ago the research on BITA started and in the last decade it was still in the top 3 of the CIO agenda each year (Luftman, Kempaiah, & Nash, 2005).

Information management in the present research is approached as the understanding of information management in the Netherlands: 1) the management of information as a business resource, 2) the link between business and IT (Maes, 1999). Thus an overlap exists between BITA and IM in our Dutch definition. Outside of the Netherlands information management is primarily known as managing information as a business resource.

A maturity model describes the evolution of an organization over time. By assessing a specific area against a norm we can measure the maturity (Santana Tapia, 2009). Given this measurement we can position an organization at a certain maturity level. Specific recommendations can be made to this organization to increase their maturity.

With the next step in the research process we intended to find potential solutions that already existed and could possibly assist in our research. We selected five maturity models based on their appropriateness and relation to information management. The models are Strategic alignment Maturity Model (Luftman, 2003), Gartner Enterprise Information Management (EIM) (Newman & Logan, 2008), IBM Data Governance Council Maturity Model (IBM Data Governance Council Maturity Model, 2007), IDC maturity model (Duffy, 2001) and COBIT 5 (Information Systems Audit and Control Association (ISACA), 2012). None of the found models could serve as a solution for our model. The reason being a lack of an adequate set of information management related domains. Relevant domains were present in the models however we found it not complete enough. From the maturity models we extracted the domains we perceived as important for our model.

Following we considered the specifics of the desired IM MM. We conducted a first round of interviews amongst Capgemini IM experts where we found the four domains of the maturity model. The four domains are value, innovation, co-creation and agility (VICA). Another round of interviews was conducted amongst Capgemini IM experts so we could retrieve the key characteristics of the model.

The previous found domains and key characteristics delivered a proposal model. The next step in the research process was to populate the proposal model by interviewing a variety of organizations with regard on their implementation and vision on information management. After the analysis and the process of the interviews with the organizations we further developed the VICA model.

An evaluation consisting of two parts has been performed on the VICA model. The first part was a focus group where Capgemini IM expert participants were asked question about the fundamentals of the proposal model. We found that the renewing approach to IM maturity with VICA is accepted. The second part of the evaluation was a walk through interview on the final model. We found that the VICA model can be applied to determine the information management maturity of an organization. However more in-depth research is needed to validate and complement the model with quantitative and case studies data.

9.2 Contributions to research field and practice

9.2.1 Contribution to research field

We have found that information management is a relatively young and typically Dutch phenomenon. The available literature on the topic is limited and originates from a selected group of researchers. Also, we observed that to a certain extent the available scientific literature is outdated. No scientifically grounded models are available which describe the development of information management. With the present study we have contributed to the current research field by finding recent topics with relation to information management. We have presented these topics in the form of a model with domains and related key characteristics such that maturity distinctions would become clear.

Literature shows a variety of business-IT alignment maturity models, which can be applied to information management up to a certain point. However, information management according to our definition covers a wider area than business-IT alignment itself. Thus it renders the BITA maturity models not suitable for assessing information management maturity. The result of the present study is a maturity model that is focused on information management maturity at the present time.

The present study shows the explorations we have done on the information management field. By questioning experts and practitioners we got an understanding on what is currently relevant to the field and will be in the near future. We translated the interview outcomes into a maturity model. These findings can be taken into account for future research, for example on validity evaluation or extension of the model.

9.2.2 Contribution to practice

For practitioners the present research contributes in several ways. First of all, we have identified relevant and recent topics regarding information management. Organizations can check how complete their information management department is according to our domains. A possibility is to look at the information management related activities. Can they be extended with key characteristics from the VICA domains? Or is it possible to improve a current activity? The VICA domains give insight into the format of information management.

Second, organizations can get an estimation on information management maturity in their organization. By ranking information management activities according the VICA maturity model one could see whether it is present in the lower or higher maturity group. Of course, VICA is not a fully validated model but it gives an impression on the current state of the organization.

We also identified near future developments for information management inside organizations. These future developments are based on interviews with practitioners at different organizations. They see these developments as the next step in advancing information management for the organizations they work for. We divided these future developments according to the VICA domains and the two maturity groups. Practitioners can get an understanding what is currently going on in the information management field and could select topics they would like to focus on.

Finally we contribute to organizations like Capgemini who want to offer services on information management. Those organizations can take our findings as a basis for further development. For example they can offer specific IM services on one of the domains such that it can be improved in a client organization. Another possibility is to offer guidance on information management maturity in general. This can be based on the four domains and corresponding key characteristics. A client organization can be advised on several matters such that information management as a whole in the organization will improve.

Organizations can also extend the VICA model by adding more domains or key characteristics they deem important from their own experience. This would result in a maturity model that is complemented based on the organization's clients and their knowledge base. However by simply adding more content to the VICA model and not validating it will not result in a trustworthy model.

9.3 Recommendations for Capgemini

The original graduation project assignment of Capgemini was to develop a maturity model for information management. We have delivered a proposal maturity model. At this point the fundamentals of the framework are present. Further research is needed to improve the model and possibly elaborate it further. With the current findings we can advise Capgemini the following:

- **Include the VICA model in the annual Capgemini IM survey**

The maturity model up to now is not validated completely and is based on a small sample. By including the VICA model in the IM survey research on information management in the practical field, Capgemini will get a deeper understanding how the model applies to different organizations in practice. What would be interesting to find out is whether the domains and key characteristics are relevant for all industries and what can be added to the model. Getting answers to these questions will give Capgemini the opportunity to validate the model and improve it based on more data from practice.

- **Create specific information management services by applying the VICA model at existing clients organizations**

Capgemini can create new information management services. These services can be based on the VICA model applied to existing clients. We expect that some problem areas that are identified and are recurring at several clients could be an indication for a service that is needed. It is not required to offer full services comprising all the VICA domains. Services focused only on e.g. the value or innovation domain, can also be valuable for organizations.

- **Develop activities to support the present two maturity groups**

The present maturity model does not advise on what steps to take on improving the current information management maturity in one of the two maturity groups. By developing activities for the specific key characteristics in the model, organizations can be advised on what to do next in their situation. The addition of these activities to the model will complement it and enable to optimize the activities for future use. The activities could be related to the services in the previous recommendation.

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Appendix A

Interview guide – First Case Study

- Voorstellen
- Uitleg onderzoek
- Doel van het gesprek

- Wat is IM volgens u?
- Welke klanten heeft u gesproken over IM?
- Welke onderwerpen kwamen ter sprake bij deze gesprekken?
- Welke onderwerpen zag u veel terug bij meerdere klanten?
- Wat zijn volgens u de “hot topics” binnen IM?
- Hoe ziet u deze “hot topics” terug komen bij klanten? M.a.w. hoe gaan klanten hier mee om? (zoeken naar verschillende volwassenheidsniveaus)
- Kunt u voorbeelden van klanten geven die heel jong zijn t/m heel volwassen op het gebied van IM volwassenheid? Een stereotypering.

- Wat zijn volgens u de dimensies binnen IM, dat wil zeggen de gebieden waarop je IM volwassenheid binnen organisaties kunt beoordelen.
- Hoe kun je volgens u aan dimensie X volwassenheidskarakteristieken toekennen, op bijvoorbeeld een volwassenheidsschaal van level 1 t/m 5?

- Heeft u nog tips voor mijn onderzoek? Bepaalde zaken waar ik naar zou moeten kijken?

Appendix B

Interview guide – Second Case Study

A. Introductie

(5 minuten)

- > Kort voorstellen
- > Uitleg onderzoek
- > Doel van het interview
- > Toestemming vragen om het interview op te nemen
- > Toestemming vragen om naam + organisatie te publiceren

B. Algemene vragen

(10 minuten)

1. Kunt u uw rol/functie beschrijven? Wat zijn uw taken?

2. Hoe lang bestaat de functie informatiemanager in uw organisatie?

jaar

Definitie: informatiemanager is de verantwoordelijke voor demand management, degene die de business wensen vertaalt in IT oplossingen

3. Hoe lang bent u werkzaam in het vakgebied informatiemanagement?

jaar

4. Hoe belangrijk is informatiemanagement, volgens u, in uw organisatie?

1 Helemaal niet belangrijk	2 Niet belangrijk	3 Neutraal	4 Belangrijk	5 Heel belangrijk

5. Hoe belangrijk vindt de organisatie informatiemanagement, volgens u?

1 Helemaal niet belangrijk	2 Niet belangrijk	3 Neutraal	4 Belangrijk	5 Heel belangrijk

6. Wat is informatiemanagement in uw organisatie?

7. Wat zou informatiemanagement moeten zijn in uw organisatie?

8. Wat is uw achtergrond in vorige functies?

- ☐ Intern doorgestroomd/gegroeid vanuit ICT
- ☐ Intern doorgestroomd/gegroeid vanuit de Business
- ☐ Van buiten de organisatie binnen gekomen met een achtergrond in ICT
- ☐ Van buiten de organisatie binnen gekomen met een achtergrond in Business
- ☐ Anders namelijk: _____

9. Wat was de omzet van uw totale organisatie over het afgelopen (boek)jaar in mln?

- ☐ < € 100
- ☐ € 100 - € 1000
- ☐ € 1000 - € 5000
- ☐ € 5000 - € 10.000
- ☐ > € 10.000

10. Hoe groot was het totale IM budget (incl. FTE, projecten en beheer) voor datzelfde (boek)jaar in mln: € 0,1 (= €100.000) ?

- ☐ < € 0,1
- ☐ € 0,1 - € 1
- ☐ € 1 - € 5
- ☐ € 5 - € 10
- ☐ > € 10

11. Wat is de grootte van uw organisatie (in aantal werknemers)? FTE

12. Uit hoeveel medewerkers bestaat uw Business unit waarvoor u als IM bent opgesteld? FTE

13. Hoeveel Informatie Managers zijn er in uw organisatie? FTE

C. Inhoudelijke vragen

(45 minuten)

> Korte introductie volwassenheidmodel

14. Hoe volwassen schat u uw organisatie in op het gebied van informatiemanagement?

> Korte uitleg VICA

C1. Value

	0	1	2	3	4	5
Value						

15. Hoe kijkt uw organisatie naar de waarde van IM? / Wat verstaat u onder waarde van IM?

16. Hoe volwassen schat u IM binnen de organisatie op het gebied van waarde?

17. Hoe wordt de waarde bepaald? (wordt dit gedaan dmv business cases of zijn er personen die zeggen wij gaan dit doen zo en zo doen want dat is goed voor de organisatie)

18. Maakt uw organisatie business cases?

19. Worden business cases gemeten en geëvalueerd: benefit tracking?

20. Is er een stuurgroep? Hoe formeel is die stuurgroep?

21. Is er sprake van projectportfoliomanagement binnen uw organisatie? Hoe worden er prioriteiten gegeven aan projecten en wijzigingen?

22. Bestaat er een programma dat de koers bepaald?
23. Hoe wordt er omgegaan met houdbaarheid van systemen?
24. Speelt aanwezigheid van uw organisatie in een keten, een belangrijke rol voor creatie van waarde in uw organisatie? Worden er initiatieven vanuit de keten genomen om waarde te creëren?
25. Welke ontwikkeling zou u met de organisatie willen door maken om de waarde van de informatievoorziening te vergroten?
26. Waar wilt u uiteindelijk naar toe in de dienstverlening die uw organisatie levert? Naar burgers/maatschappij/etc.

C2. Innovation

	0	1	2	3	4	5
Innovation						

27. Hoe kijkt uw organisatie naar innovatie?
28. Hoe volwassen schat u IM binnen de organisatie op het gebied van innovatie?
29. Wat doet u in de dagelijkse praktijk om IM innovatie te stimuleren?
30. Welke rol speelt IM bij innovatie?
31. Hoe gaat IM om met innovatie?
32. Is IM leidend in innovaties?
33. Wat is de verhouding ongeveer tussen dagelijkse operatie en innovatie?
34. Op wat voor een innovatie richt uw organisatie zich?
Technologie/(business)proces/dienstlevering en product/keten
35. Wat is er nodig om een innovatieve organisatie te kunnen zijn?
36. Wat is binnen uw organisatie de oorsprong van innovatie? IM/business/IT?
37. Waar komt de meeste innovatie vandaan in uw organisatie? Wie is daar verantwoordelijk voor?
38. Wat is nodig om een innovatie een succes te laten zijn?
39. Is uw organisatie voldoende innovatief? Zo niet, wat moet er gebeuren om dat wel zo te laten zijn?
40. Wat is de snelheid van innovatie in uw organisatie?
41. Heeft u een concreet voorbeeld van IM gedreven innovatie binnen uw organisatie?

42. Is er sprake van innovatie met partners in een keten?

43. Hoe wilt u innovatie vanuit IM versnellen? Waar wilt u uiteindelijk naar toe?

C3. Co-creation

	0	1	2	3	4	5
Co-creation						

44. Hoe ziet co-creatie er uit voor uw organisatie? Wat verstaat u onder co-creatie? Binnen vs buiten de organisatie?

45. Hoe volwassen schat u IM binnen de organisatie op het gebied van co-creatie?

46. Hoe ziet de totale waardeketen er binnen en buiten uw organisatie uit. Welke rol speelt IM hierin?

47. Hoe heeft een samenwerking in een keten zich ontwikkeld voor uw organisatie?

48. Op welke gebieden wordt er momenteel samengewerkt in de keten?

49. Vind samenwerking in de keten plaats op basis van vertrouwen of gezagsverhoudingen?

50. Is de gezagsverhouding tussen u en samenwerkende ketenpartners duidelijk/Wie welke rollen heeft?

51. Wat zijn belangrijke aspecten voor ketensamenwerking?

52. Is er sprake van keteninnovatie? Wordt er samen in de keten aan innovatie gewerkt? Hoe ziet dit er precies uit? Wat is het doel van deze keteninnovatie? Gezamenlijke vooruitgang of alleen uw eigen organisatie?

53. Hoe ziet u co-creatie verder ontwikkelen in uw organisatie?

54. Hoe ziet u de rol van IM hierin ontwikkelen?

55. Waar wilt u uiteindelijk naar toe met co-creatie op het gebied van informatievoorziening?

C4. Agility

	0	1	2	3	4	5
Agility						

56. Wat verstaat u onder wendbaarheid van IM?

57. Hoe wendbaar is uw organisatie op de volwassenheidsschaal?

58. Hoe belangrijk is wendbaarheid voor uw organisatie?

59. Hoe wendbaar is uw organisatie m.b.t. koerswijzigingen in programma's en besluitvorming?
60. Hoe wordt er omgegaan met agile projectmethodes? Zoals Scrum. Komen deze ontwikkelingen vanuit de business of IT?
61. Is er sprake van entrepreneurship binnen uw organisatie? Bijvoorbeeld in afzonderlijke business units? Hoe gaat uw organisatie om met entrepreneurship?
62. Hoe heeft u de wendbaarheid van uw organisatie zien ontwikkelen?
63. Hoe kan IM helpen de wendbaarheid van uw organisatie te vergroten?
64. Draagt wendbaarheid bij aan de waarde van uw organisatie? Hoe effectief is dat?
65. Waar wilt u uiteindelijk naar toe op het gebied van wendbaarheid?

D. Afsluiting

- > Bedanken voor deelname aan interview
- > Resultaten zullen worden gedeeld
- > Hoe vond u het gesprek gaan? Was het lastig? Bent u dingen tegengekomen waar u niet aan gedacht had?