Antecedents to business-IT alignment in a healthcare environment

Diagnosing readiness to change

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Preface

This report, titled 'Antecedents to business-IT alignment in a healthcare environment' is the result of a research performed in the University Medical Centre Groningen.
In this report I will show what preconditions need to be present in organizations in order for alignment between the organizations core activities and ICT initiatives to be possible. This research is commissioned by the department Functioneel & Gegevensbeheer of the UMCG, but is also performed in the context of my graduation in Business Administration at the Rijksuniversiteit Groningen.

First of all I would like to thank the principal of this research Anneke Weewer for allowing me to execute this research.

This research would not have been possible without the cooperation of many other people in the UMCG. I would like to express my thanks to all of the people who allowed me to interview them. The conversations we had were not only interesting, but they were often fun as well. Thank you for sharing your thoughts, ideas and concerns about ICT in the organization.

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Thomas Wattel

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Abstract

Introduction
The efforts of executives to make ICT decisions that fit their organizations best, can be described as business-IT alignment. This research focuses on the preconditions, or better: antecedents, to business-IT alignment and relates this to the discipline of organizational change. This is based on the theoretical concept that business-IT alignment is a process of change over time, rather than an end state that can be achieved in reality. A review of existing theory on both subjects identified seven antecedents: a culture focused on collaboration and cooperation; the sharing of knowledge; prior experience with ICT; leadership; planning processes; communication; and: change readiness.

A case study is performed in the University Medical Centre Groningen; an organization where issues in the alignment of business and ICT have been notified.

Methods
Twenty interviews have been performed with key-informants throughout the organization, from both ICT and business departments.

Results
The interviews confirmed that the seven antecedents are influencing business-IT alignment in practice. Besides that, two potentially new antecedents could be derived from the interviews that would benefit from further research: the organizations financial situation and training & education.

Conclusion
By finding that the seven antecedents are of importance to practice, the legitimization for further research on the interconnection of business-IT alignment and organizational change is strengthened.

1 Introduction

Aligning ICT to the business objectives has been at the attention of executives and IT practitioners in organizations for years (Smaczny, 2001; Luftman, 2000; Chan & Reich, 2007). In the University Medical Centre Groningen, this is no different, especially now that the organization is facing financial cuts by the national government. A consultancy firm has performed research within the organization to identify potential savings (McKinsey & Company, 2011). This resulted in an advice for saving 25 million euro annually. The target for savings on the ICT department is 2.7 million, which is 15% of their current size (personnel and outsourcing costs). The approach that was identified by the Board of Directors for the ICT department includes the current ICT activities; an analysis on the added value of decentralized ICT activities, and all other activities under centralized management. Despite the planned target for savings, the organization would like to know how they can achieve a better fit between their ICT and their business activities. The alignment between 'what the organization wants' (business strategy) and 'what is reality' (ICT process) has to be improved. This concept is referred to in literature as Business-IT alignment (Smaczny, 2001; Luftman, 2000; Chan & Reich, 2007).

This research takes a broad look at business-IT alignment and tries to identify what the antecedents of business-IT alignment are and what antecedents have to be enhanced in order to achieve closer alignment between the business and it's ICT activities. An important theoretical concept behind this paper is about the interconnection between business-IT alignment and organizational change. Change management is a sub-discipline of business administration and business-IT alignment is a perspective within Information Systems (IS), another sub-discipline of business administration. In his research, Rozendal (2010) stated that: "*The link between these two seemingly diverse research streams can be found in a comparison of the dimensions of business-IT alignment and the premise of organizational change.*" (Rozendal, 2010: p. 6)

In the following chapter this relationship will be explained using literature on business-IT alignment and organizational change. The basic idea, that both share the same dimensions and that there are possibilities for integration, is explained there. In literature not a lot of attention has been given to the relationship between business-IT alignment and change management in particular (Rozendal, 2010). Authors do however recognize that the classical view on business-IT alignment, often captured in a Strategic Alignment Model (SAM), is too static in today's fast changing environment (Barrett et al., 2006; Chan & Reich, 2007; Smaczny, 2001). Therefore further research using both views of alignment, as an end state and as an ongoing (changing) process, is suggested (Chan & Reich, 2007). In this research the latter will be at the centre of attention. Furthermore, this thesis adds to existing literature by answering to the call of Barret et al. (2006) who state that: *"…what is needed are studies (…) that draw on and combine the insights provided by both the OS and the IS literatures to advance the study and practice of ICT-related change."*

After the theoretical explanation of that relation, it is possible to focus on the main goal of this thesis. This study attempts to identify antecedents of business-IT alignment coming from the before mentioned relationship and test these factors in practice at the UMCG. The objective of this study is to provide propositions for business-IT alignment initiatives. These will focus on the preconditions an organization must meet in order for alignment to occur. This objective leads to the main research question:

WHAT ARE THE ANTECEDENTS OF BUSINESS-IT ALIGNMENT AND HOW IS BUSINESS-IT ALIGNMENT ENABLED THROUGH THESE ANTECEDENTS?

An analytical framework is constructed, based on the theoretical section of this paper and the framework is tested in the practice of the UMCG, who are executing initiatives to improve their business-IT alignment.

2 Theoretical Background

A vast amount of literature has been published about the relationship between organizations and their IT activities. Chan & Reich (2007) present an overview of literature on this topic and they state that there are hundreds of articles available on the alignment issue. A lot of attention is given to the literature collected in the article of Chan & Reich (2007), since they provide an extensive overview on the most relevant literature on business-IT alignment. This is completed by other relevant literature on both business-IT alignment and change management.

2.1 Business-IT alignment and Organizational Change

Though it has been given different names, e.g. fit (Chan, 2001; Henderson and Venkatraman, 1993), linkage (Reich & Benbasat, 1996), integration (Henderson and Venkatraman, 1993), and there will probably be other terms used in literature, business-IT alignment is a term that many authors adopt. Most authors recognize the importance of achieving alignment; however they acknowledge that they struggle in understanding how to achieve it (Preston & Karahanna, 2009).

The most common view on business-IT alignment is expressed by Sauer and Yetton (1997), stating that *"the basic principle is that IT should be managed in a way that mirrors management of the business*." Chan & Reich (2007) explain that the early views on alignment were solely about linking the business plan and the IT plan, or about congruence between the business strategy and the IT strategy. Over time, different views on alignment have been expressed and with that, different dimensions of business-IT alignment became visible. Therefore, the concept of business-IT alignment is described by the dimensions that can be derived from literature.

By examining the dimensions that authors use to describe alignment, the basic idea that business-IT alignment and organizational change are related is supported. Reading business-IT alignment literature the dimensions of alignment that come into sight are: strategic and intellectual dimensions, structural dimensions, the informal structure, social dimension, and the cultural dimension. The different dimensions shine a different light on the definition of business-IT alignment. It is important to appreciate the different dimensions presented in literature, since it colors the way an author looks at business-IT alignment.

Change management can be seen as congruent with and complementary to these dimensions. In change management literature the same dimensions come forth. Not very surprisingly, considering the notion of Burnes (2009) that change is an ever-present feature of organizational life, both at an operational and strategic level. According to Barrett, et al. (2006), other authors, e.g. Wanda Orlikowski & Stephen Barley (2001), report on the close interconnection between ICT and organizational change, Barrett, et al. (2006) argue that despite that connection most Organizational Studies (OS) scholars address mainly the technical side of this relation and leave the more human related or social aspects out of the equation. Therefore they plead for more research on that interconnection.

As was mentioned before, in literature not a lot of attention has been given to the interconnection between business-IT alignment and change management in particular. However, some other constructs of the relationship between business-IT alignment and organizational change are presented in literature. First, there is the notion that alignment takes place in a broad context in where organizational change is one of the many factors (Baets, 1992). A closer link is mentioned by Jenkin & Chan (2006), as cited by Chan & Reich (2007), who state that alignment processes are necessary after changes in the organization have occurred. In that case, change triggers alignment initiatives. A third link between business-IT alignment and change is a situation where change influences an organization's capabilities for aligning business and IT. Chan & Reich (2007) mention that Street (2006) found that alignment capabilities are weakened in organizations that had experienced episodes of punctuated change.

Another construct of the relationship between business-IT alignment and organizational change is mentioned by Chan & Reich (2007) who state that from alignment industry-wide changes can emerge. Strategically well aligned IT can change industry performance by increasing the scope and impact of IT in organizations, causing e.g. market shifts.

Not only is there an interconnection between business-IT alignment and organizational change. Moreover, as a colleague proposes in his thesis: "*Both* (Organizational change and business-IT alignment) *deal with similar concepts"*, and *"business-IT alignment can be construed as the eventual outcome of organizational change"*. He therefore maintains that *"business-IT alignment is enabled through organizational change such that factors from the latter can act as salient drivers for the former"* (Rozendal, 2010). In this research this view on the relationship between change management and business-IT alignment is shared and further developed.

Chan & Reich (2007) link alignment to organizational change when identifying some IT alignment challenges. Since organizations operate in a dynamic and changing environment, it is questionable whether a 'state' of alignment will ever exist in practice. Instead, business-IT alignment is seen as "a process of change over time and continuous adaptation" (Henderson and Venkatraman, 1993; as cited by Chan & Reich, 2007). Furthermore, besides the dimensions of alignment, change readiness is seen as a factor influencing that alignment (Luftman, 2000). Since change readiness can be seen as an antecedent of successful change, it will be dealt with as an antecedent of business-IT alignment in this paper.

2.2 Dimensions of business-IT alignment and Change Management

In the following section, different views on, or dimensions of, business-IT alignment are displayed and compared to dimensions used in literature on organizational change. By doing that, the interconnection between the two research streams is proven. Thereby, the choice to examine antecedents from both IS and OS literature simultaneously, is defended.

Reich & Benbasat (2000) divide literature on business-IT alignment into two separate perspectives, namely the intellectual and the social dimension of strategic alignment. This division can also be seen in change management literature (Rozendal, 2010). In this research however dimensions from both perspectives are described. These dimensions will be elaborated on in the section below. They are derived from Chan & Reich (2007) and complemented with other literature on both business-IT alignment and change management.

2.2.1 Strategic and intellectual dimensions

The most used dimension of business-IT alignment is the strategic or intellectual dimension. The intellectual dimension is defined by Reich & Benbasat (2000) as the '*state in which a high quality set of interrelated IT and business plans exist.*' This is often referred to as planning processes (Chan & Reich, 2007) and governance (Luftman, 2000). The importance of a strategic plan is addressed in both alignment literature as well as in change management literature. In alignment literature the importance is mentioned that IT strategy is congruent to the business strategy (Preston & Karahanna, 2009), that IT strategy should support business strategy, or even that both should be developed simultaneously (Chan & Reich, 2007).

In change management literature the importance of strategy is displayed as well (Burnes, 2009). Strategy is seen as the cornerstone to diagnosing change, since it provides the criteria to asses other design decisions (Palmer, et al., 2009). Models for diagnosing change in organizations, e.g. 7-S Framework, The Star Model, The Congruence Model, The Burke Litwin Model, presume that when strategy is missing, unclear, or not agreed upon, confusion occurs (Palmer, et al., 2009).
This dimension to alignment implies that it is difficult for alignment to occur if the business does not have a formal set of plans (Chan & Reich, 2007).

2.2.2 Structural dimensions

Another dimension of alignment is the degree of structural fit between business and IT. Chan (2002) states that structural alignment is influenced by the location of IT decision

making rights, reporting relationships, (de)centralization of IT, and the deployment of IT personnel.
Other authors only use the degree of (de)centralization to define an organizations structure. Brown and Magill (1994) and Earl (1989) are cited by Chan & Reich (2007) as examples of the latter.
In change management literature, structure is defined as the formal authority relationships and grouping of activities as represented on an organizational chart (Palmer, et al., 2009).
Most organizational models stress the importance of aligning the organizational structure to other organizational dimensions, e.g. strategy, skills, leadership, people practices, or environment. These models have been mentioned before, e.g. 7-S Framework, The Star Model, The Congruence Model, The Burke Litwin Model, as cited by Palmer, et al. (2009).

2.2.3 The informal structure

IT alignment can be improved by the informal structure, defined as '*relationship-based structures that transcend the formal division of labor and coordination of tasks*', by Chan (2001), as cited by Chan & Reich (2007). Shared knowledge and prior experience with IT projects are identified as antecedents related to the informal structure. Preston & Karahanna (2009) investigated shared understanding as social dimension of alignment. They define shared understanding as the degree of shared cognition between the CIO and the TMT on the role of information systems in the organization.

In change management literature prior experience with change projects are also identified as important factors influencing support for change. Palmer, et al. (2009) refer to this as the 'reaction to the experience of previous changes'. Palmer, et al. report this as being "*the most reliable predictor of how people will interpret the implications of an announcement of change*". In addition to that, past negative experiences with change can lead to anxiety and uncertainty for future changes (Kotter & Schlesinger, 1979). Shared knowledge, or 'education and communication', is seen as a solution to increase understanding of the change and thereby increasing support for change (Palmer, et al., 2009).

2.2.4 Social dimension

Some of the authors on business-IT alignment only make a division between the intellectual and the social dimension. This is mainly done by authors who propose models for aligning aspects related to the social dimension (Reich & Benbasat, 2000; Earl, 1989; Campbell, 2005; Lee, et al, 2008). The social dimension of strategic alignment is defined by Reich & Benbasat (2000) as: "*the state in which business and IT executives within an organizational unit understand and are committed to the business and IT mission, objectives, and plans.*" This definition mentions two important factors: 'understanding' and 'commitment'. Understanding can be influenced by the 'invisibility of the IT staff' and communication barriers. Commitment is influenced by the history of the business-IT relationships, attitudes of organization members to IT, shared domain knowledge, and leadership (Earl, 1989; Cambell, 2005).

The social dimension of business-IT alignment is highly related to organizational change. A well known dimension of change management is dealing with resistance to change. Next to that, leadership, power, politics and cultural issues are reported to play a role in change management (Burnes, 2009; Palmer, et al., 2009)

2.2.5 Cultural dimension

Some authors have looked at alignment in the light of cultural aspects. Chan & Reich (2007) state that alignment is fundamentally about cultural and behavior change. Furthermore, they note that alignment needs to be culturally supported. Strong company culture is seen as a precondition to the type of informal structure that occurs (Chan, 2002; Nickels & Janz, 2010). Futhermore, Nickels & Janz (2010) find that congruence of the perceptions of the prevailing organizational culture between business and IT departments is significantly related to the level of strategic alignment.

In change management literature there is a wide variety of definitions of organizational culture and what it implies (Burnes, 2009). In his book Managing Change, Burnes (2009) explains that there is little agreement amongst scholars on the nature of culture, whether it can be changed, and what the benefits can be from trying to

change the culture. In this thesis, however, a basic and universally understand definition of culture is adopted from Schwartz and Davis: *Culture is a pattern of beliefs and expectations shared by the organization's members. These beliefs and expectations produce norms and powerfully shape the behavior of individuals and groups in the organization* (Schwartz & Davis, 1981, as cited by Burnes, 2009). When applying the cultural dimension to business-IT alignment and change management, there is an important role for top management. According to Chan & Reich (2007) commitment from top management has to be present for alignment to be possible: "*People are not going to listen to what the CIO says as much as they are going to watch what the CIO does, and what the CIO's business partners do.*" (Chan & Reich, 2007)

2.2.6 Summarizing table

In the table on page 9, the key concepts and the related references of chapter 2.2 are summarized. With this, it becomes clear that dimensions derived from the IS literature and OS literature use similar concepts.

2.3 Antecedents

Now that the different dimensions to business-IT alignment have been described, antecedents to that alignment can be derived from literature on these dimensions. One difficulty of collecting these antecedents to alignment from literature is that most authors use different dimensions, but at the same time there is much overlap and interdependencies. The antecedents that are described in this section have been derived from Chan & Reich (2007). Added to these antecedents is Change Readiness, which is found to be interrelated to some of the other antecedents.

2.3.1 Organizational culture

A corporate environment of cooperation and collaboration between business and IT has been identified as enabling alignment. Collaboration between business and IT personnel must be present at all levels of an organization. (Chan & Reich, 2007; Reich & Benbasat, 2000; Nickels & Janz, 2010). Congruence of the perceptions of the prevailing organizational culture between business and IT departments can be a way to assess this in organizations.
Changing the organizations culture to support IT alignment is a long term process. Chan & Reich (2007) state that it is not enough to change the CIO or to implement an IT steering committee. For example in information system development a major cause of failure can be subscribed to differences in culture between IT and business members (Reich & Benbasat, 2000).

Earl (1989) and Campbell (2005) name some issues that can hinder a culture of cooperation and collaboration, as the invisibility of the IT staff, communication barriers, history of IT/business relationships, attitudes of organization members to IT, shared domain of knowledge, and leadership. The organizational culture also is characterized by the stories that are told within the organization. Chan & Reich (2007) note that: "*Over long term, the culture and stories within the organization must move from those of failure and defeat to those of mastery and success.*"
Organizational culture as antecedent of business IT alignment is defined as:

The degree to which the organizations environment is one of collaboration and cooperation.

Dimensions	Key concepts	Key references
Strategic and intellectual dimensions	B) State in which a high quality set of interrelated IT and business plans exist. C) When strategy is missing, unclear, or not agreed upon, confusion occurs.	B) Reich & Benbasat (2000) C) Palmer, et al. (2009)
Structural dimensions	B) Structural alignment is influenced by: location of IT decision making rights, reporting relationships, (de)centralization of IT, and the deployment of IT personnel. C) Organizational models, e.g. 7-S Framework, The Star Model, The Congruence Model, The Burke Litwin Model, stress the importance of aligning the organizational structure to other organizational dimensions, e.g. strategy, skills, leadership, people practices, or environment.	B) Chan (2002) C) Palmer, et al. (2009)
The informal structure	B) Shared knowledge and prior experience with IT projects are identified as antecedents related to the informal structure C) Reaction to the experience of previous changes is the most reliable predictor of how people will interpret the implications of an announcement of change. And: past negative experiences with change can lead to anxiety and uncertainty for future changes.	B) Chan (2001) C) Palmer, et al. (2009) And: Kotter & Schlesinger (1979)
Social dimension	B) The state in which business and IT executives within an organizational unit **understand** and are **committed** to the business and IT mission, objectives, and plans. C) 'Dealing with resistance to change' is a well known subject in change management literature.	B) Reich & Benbasat (2000) C) Burnes (2009), and Palmer, et al. (2009)
Cultural dimension	B) Congruence of the perceptions of the prevailing organizational culture is significantly related to the level of strategic alignment. And: Alignment is fundamentally about cultural and behavioral change. C) Culture is a pattern of beliefs and expectations shared by the organization's members. These beliefs and expectations produce norms and powerfully shape the behavior of individuals and groups in the organization.	B) Nickels & Janz (2010) And: Chan & Reich (2007) C) Schwartz & Davis (1981) as cited by Burnes (2009)

B = Business-IT alignment literature (IS literature)
C = Change management literature (OS literature)

Table 1 Key concepts of dimensions on Business-IT alignment & Change Management (The dimensions are derived from Chan & Reich (2007)).

2.3.2 Shared knowledge

The second antecedent to business-IT alignment is the sharing of knowledge, which can be related to the informal structure dimension as well as to the social and cultural dimension of alignment literature. Reich and Benbasat (2000) state that behaviors such as communication between business and IT is influenced by shared domain knowledge. It even improves connections between IT and business planning. Thereby they found that shared domain knowledge was an antecedent to long-term alignment (Chan & Reich, 2007).
Preston & Karahanna (2009) found that shared language, and shared domain knowledge have a significant effect on shared understanding, which is one of the social aspects of business-IT alignment. Luftman (2000) uses the term partnership to describe the shared domain of business and IT executives. This indicates that also on top management level cooperation and sharing of domains should occur. The findings of Kearns & Sabherwal (2007) confirm this by stating that top managers' knowledge of IT, as part of their shared domain knowledge is an area that deserves consideration.
Taken that last notion into account, shared domain knowledge as antecedent of business IT alignment is defined as:

The degree to which knowledge is shared between business and IT personnel on all organizational levels.

2.3.3 Prior experience with IT

Chan, et al (2006) find that the credibility of the IT team is influenced by their track record of previous IT projects and this influences the view of top management and the end users. Successful previous IT projects are an antecedent to IT alignment. The attitude towards IT change projects can be identified by the stories that are being told in the organization. Chan & Reich (2007) noted that there must be stories of mastery and success instead of failure and defeat.
In change management literature the success rate of change projects is reported as being low. Strebel (1996) states that the success rate is well below 50 percent and according to some as low as 20 percent. Previous experiences with change are influential to the attitude towards future change projects (Palmer, et al, 2009). Whether or not IT projects can be seen as change initiatives, previous negative experiences with change can lead to organizational members resisting to new initiatives.
Taken that last notion into account, prior experience with IT as antecedent of business IT alignment is defined as:

The degree to which prior experiences with IT projects and change initiatives are perceived as positive and successful by the organizations members.

2.3.4 Leadership approaches

According to Burnes (2009) 'management' and 'leadership' are not similar. He notes that the major difference between successful organizations and less successful organizations is the presence of dynamic and effective leadership. Leaders focus on the future, create change, create a culture based on shared values, establish an emotional link with followers and use personal power instead of the power of their position (Burnes, 2009). Kotter (1990) identified leaders as essential to aligning people to understand and believe the organizations vision.
The approach to leadership that managers adopt is related to the level of alignment that is perceived in the organization. Baker (2004) found that managers with a collaborative style indicate that their company's IT was well aligned with the business strategy, while more autocratic or indecisive leaders perceived the alignment in their firms to be lower.

In literature, different authors identify the role of top management as an important antecedent to alignment. Chan & Reich (2007), name (a.o.) Feeny, et al (1992) who address the importance of the CEO-CIO relationship, Lederer & Mendelow (1998) who state that IT executives were successful only if supported by top management, and Teo & Ang (1999) who relate three of their 12 critical IT alignment factors to top management characteristics. Not only do they mention the importance of top management's commitment, but also their confidence in the IT department and their knowledge of IT.
The leadership approach consists of support and commitment from top management to IT, but moreover on the way top management shows this commitment to the organization. The statement from Chan & Reich (2007) was mentioned before: that people watch more what the CIO and the CIO's business partners do instead of what the CIO

says. Kotter (1996) addressed this issue in his book Leading Change, stating that a common error is under-communicating the vision. He states that deeds are a more powerful form of communication than words and nothing undermines change more than behavior by important individuals that is inconsistent with the verbal communication. In addition he states that leadership can be enhanced by forming a guiding coalition with enough power to lead the change.
Leadership approaches as antecedent of business IT alignment is defined as:

The degree to which executives form a guiding coalition focused on collaboration, that shows rather than tells what the change is about.

2.3.5 Planning processes

IT planning refers to the formalization of business plans and the relation to the overall organizational strategy. This implies that formalized business plans are at the base of successful IT alignment. As Chan & Reich (2007) state it: "*Simply put, alignment cannot readily occur if the business lacks a formalized strategic business plan in the first place."* The next step is then relating the IT strategy to the business strategy. Again an important role is identified for top management. The CEO should "*encourage business participation in IT planning, the establishment of an IT plan, and IT management's participation in business planning*" (Lederer & Mendelow (1998), cited by Chan & Reich, 2007).
Luftman (2000) places strategic plans under the term of governance, which is defined as "*the degree to which the authority for making IT decisions is defined and shared among management. It includes setting IT priorities and allocating IT resources.*" (Luftman, 2000). The authority for making decisions is expressed in, amongst others, the organization structure, steering committees, budgetary control and investment management. Venkatraman, et al. (1993) also use governance as a more administrative, or formalized, approach to achieve strategic alignment.
Planning processes as antecedent of business IT alignment is defined as:

The degree to which strategic business plans and strategic IT plans exist and are congruent.

2.3.6 Communication

The level of communication between business and IT executives will positively influence the level of alignment (Reich & Benbasat, 2000). This has to do with shared knowledge, which was mentioned before. Reich & Benbasat (2000) found in their study that when shared domain knowledge was high, communication between the two groups was strategic and frequent, and the result was a high level of alignment. As communication increases, the likelihood that shared ideas and beliefs will occur increases (Littlejohn, 1996, as cited by Reich & Benbasat, 2000).
Teo & Ang (1999) name frequent communication between users and IT departments a critical success factor to alignment. Sledgianowski & Luftman (2005) state that it is fundamental that managers and users communicate regularly and that it has to be pervasive throughout the organization.

Next to the frequency of communication, also the communication styles and methods used by leaders and between business and IT departments are of influence on alignment. Palmer, et al. (2009) stress that change agents should choose a strategy for communicating change. They state that there is an optimum amount of information that should be transmitted, no overload but also not too little information, and that there is an optimum style in order for communication to be effective, named: underscore and explore. This is defined as "*creatively synthesizing executives' initiatives and employee concern, by which organizational potential is maximized."* An important notion is that the communicating strategy depends on the type of change and the stage of the change (Palmer, et al, 2009).
Communication as antecedent of business IT alignment is defined as:

The degree to which information exchange between business and IT departments is frequent, and: the degree to which communication styles used are appropriate.

2.3.7 Change readiness

The relationship between antecedents of business-IT alignment and organizational change has been mentioned before. Change readiness is a precondition to successfully perform new IT initiatives, and therefore it is adopted to be an antecedent to business-IT alignment.

Readiness for change is defined by Holt, et al, (2007) as: *'the extent to which an individual or individuals are cognitively and emotionally inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo'.* Luftman (2000) addresses some questions about change readiness to measure business-IT alignment maturity. He states that organizations should examine their readiness for change in the dynamic environment they are in, and that organizations should identify whether individuals feel personally responsible for business innovation. A concluding statement he makes is: "*Getting to a non-political, trusting environment between the businesses and IT, is essential to achieve improvements."* (Luftman, 2000).
Change readiness as antecedent of business-IT alignment is defined as:

The degree to which organizational members are willing to accept, embrace and adopt IT initiatives.

2.4 Conceptual model

The theoretical analysis of seven antecedents to business-IT alignment leads to the conceptual model for this thesis. The relationship between the antecedents and business-IT alignment can be described in such a way that the antecedents are the preliminaries for alignment to occur. In other words, the antecedents are enabling business-IT alignment.

The first six antecedents presented in the conceptual model are not new, since they are derived from literature on business-IT alignment. However, this research adds value to the existing theory by examining the antecedents in practice and thereby making these topics worthwhile to examine. Moreover, the seventh antecedent: change readiness, is new and has not been added to the antecedents of business-IT alignment in previous research. The justification for adding change readiness lies in the idea that business-IT alignment is a process of change and that therefore the ability for an organization to deal with change is of importance. By adding change readiness to the conceptual model, the research streams of change management and business-IT alignment are combined.

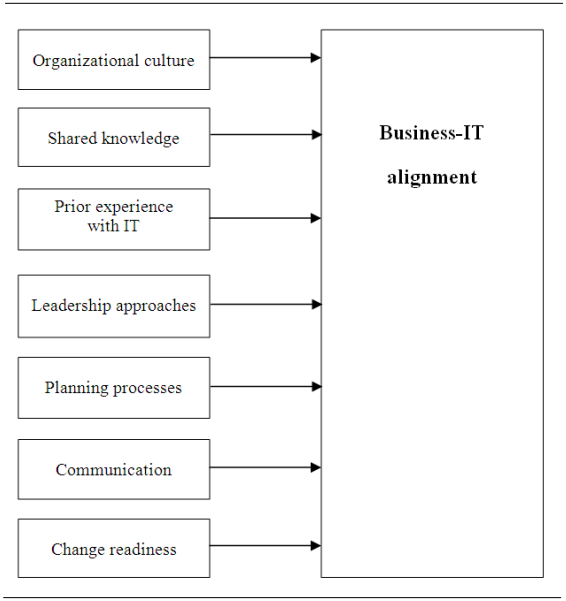

Figure 1 Conceptual model.

Concluding, when the organization's business strategy and their information technology structure are not in line with each other, people will search for the causes of that misalignment. Literature review identified seven preconditions that are necessary for alignment to exist. This research will test this model in practice and that will lead to guidelines for business-IT alignment initiatives.
In repetition, the objective of this study is to provide guidelines for business-IT alignment initiatives. These guidelines will focus on the preconditions an organization must meet in order for alignment to occur. This objective is captured in the main research question:

What are the antecedents of business-IT alignment and how is business-IT alignment enabled through these antecedents?

In combination with the conceptual model and the theoretical support for the conceptual model, this leads to the following sub-questions:

- To what extent does the organizational culture influence business-IT alignment?
- To what extent does shared knowledge influence business-IT alignment?
- To what extent does prior experience with IT influence business-IT alignment?
- To what extent do leadership approaches influence business-IT alignment?
- To what extent do planning processes influence business-IT alignment?
- To what extent does communication influence business-IT alignment?
- To what extent does change readiness influence business-IT alignment?

3 Methods

In order to provide answers for the research question and related sub-questions, twenty qualitative interviews are held within the University Medical Center Groningen (UMCG). These interviews are done with employees from a strategic, tactic and operational level on both the ICT and the business side of the organization. The combined information of these interviews will provide insight in the practice of business-IT alignment in a hospital environment.

3.1 UMCG case

The UMCG is a large hospital located in Groningen, The Netherlands. With around 10,000 employees, the UMCG is the largest employer in the northern Netherlands. In 2010, its value in terms of revenue was 901 million Euros and an end result of 5,2 million Euros. Three core tasks can be distinguished: patient care, education, and (scientific) research. Since patient care is ultimately the raison d'être of the UMCG, this research focuses on that part of the organization. The results of this research should, more or less, be applicable in the other parts as well. A complete organizational structure diagram of the UMCG is displayed in Appendix I.

The consultancy firm that was mentioned in the introduction section of this paper, identified that the UMCG organization can be characterized as bureaucratic, isolated departments (island culture), hierarchical, internal politics and tardy (McKinsey & Company, 2011). A customer / patient focus is mentioned as strength of the organization, but on coordination, control, and leadership, improvements are possible. On coordination and control, the improvements that can be made are: clear goals, tighter steering, monitoring and transparency of progress and results. In terms of leadership, improvements should be focused on decision making. In practice, too often a decision marks the start of the discussion.

For this research, a dividing has been made between business and ICT employees. One difficulty of making that distinction is that employees of the UMCG often execute more than one role in the organization. Therefore they can sometimes be classified as both business and ICT personnel. Another difficulty is that there is a high level of autonomy on the organizations sector level. This means that employees with seemingly the same function, however in different sectors, can be performing different tasks in practice. As a result, there is disagreement in the organization about the tasks that some departments or individuals should be executing.

3.1.1 Business

In the light of this research, the business side of the organization is represented by all activities in the organization next to the ICT activities. These can be generally divided into hospital care, (academic) research, and education. These three themes are interconnected through, amongst others: internships (clerkships), patient research, and lectures by medical practitioners. As a result, the ICT activities of the UMCG have to match all aspects of the organizations business.
All medical departments of the UMCG have been categorized into six sectors. Each sector is managed by a Director and supported by a Business Office.

3.1.2 IT/ ICT

ICT in a hospital environment can be characterized as being highly complex. Not only do ICT solutions have to cover all aspects of the organizations businesses, there are a lot of interdependencies between departments, and ICT plays an important role in patient safety issues. The role of ICT in hospitals is being influenced, amongst others, by medical developments, changing organizational needs, ICT developments and by governments rules and regulations. In the UMCG this has lead over the years to an ICT system that can be viewed as highly complex compared to most other industries.

Within the UMCG, around 200 employees can be characterized as ICT personnel. Of these employees, 140 are placed in one of the centralized ICT departments. The remaining 60 employees are placed in one of the before mentioned Business Offices on sector level.

Though it can be argued that there are slight differences between 'IT' (Information Technology) and 'ICT' (Information and Communications Technology), in this research the terms are used interchangeably. Nevertheless, the 'communication' part of ICT is included in this research, since communication is one of the antecedents that is being examined in this research.

3.2 Data collection

Besides reading related organizational documents, data for this research is collected and analyzed through the directed approach to qualitative content analysis, as described by Hsieh & Shannon (2005). They define qualitative content analysis as: "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns. In the directed approach analysis starts with a theory or relevant research findings as guidance for initial codes, contrary to conventional content analysis, where coding categories are derived directly from the text data. According to Hsieh & Shannon (2005) the directed approach is used in situations where prior research exists about a phenomenon that would benefit from further research. In this research the interview questions are derived from subjects as presented in the literature section of this paper. These subjects also provide guidance for initial coding, as is shown in the coding schema enclosed in Appendix V.

In total 20 interviews were performed. Each interview took between 30 and 90 minutes. The interviews were semi-structured to unearth antecedents of business-IT alignment that have not been found in literature, but are relevant in practice. Next to that, this is a delicate subject within the organization and politics are in play. Therefore other forms of data collection impose higher risk for the research, for example, to be misused by people involved to express discontent solely. This results in a need for profound questioning where interviewees have to support their statements, for instance by giving examples.

3.2.1 Interviewees

To get a wide variety of stories about the business-IT alignment and change readiness situation in the organization, and thereby improve the validity of the study, interviewees from all organizational levels were selected. Since the organization consists of many different departments and management layers, a division has been made for this research on three organizational levels: strategic, tactic and operational level. In the selection of interviewees for this research, these levels have been taken into account. Furthermore, the selected interviewees can be characterized as key informants to the subject. In the selection of interviewees, theie position and role in the organization have been taken into account. Together, the interviewees cover the major part of the relationship between business and ICT.
This led to the distribution of interviewees that is displayed in Table 1.

	ICT	Business
Strategic level	3	3
Tactical level	4	2
Operational level	3	5
Total	**10**	**10**

Table 2 Distribution of interviewees.

Some examples of employees that were interviewed are: ICT and business executives, ICT project managers, business managers, and end users. An organizational chart that displays the functions that are represented in this study is enclosed in Appendix II. Next to that, a table summarizing the interviewees, their role in the organization, and other specifications is displayed in Appendix III.

3.2.2 Pilot interview and interview protocol

A pilot interview was executed to test the interview protocol, before starting the actual interviews. The goal of this pilot interview was to see whether the interview questions were understandable to the interviewee and whether the questions would provoke conversation. The pilot interview was executed with someone who had worked in a healthcare environment for approximately six years and had

some affinity to ICT in his job there. He is now a consultant who often executes projects with ICT components in it. The consultant recognized the relevance of the presented subjects in the interview. He suggested that it was important to ask for examples, since there are a lot of closed-ended questions in the interview protocol. In retrospect, however, the added value of this pilot interview was limited by the fact that the interviewee was more familiar with the subject than most other interviewees. Furthermore, the pilot interview had more of a reviewing character instead of an interviewing character.
Next to the pilot interview the questionnaire was reviewed by the UMCG mentor who supported this research. She confirmed that the interview questions were appropriate and she could provide recommendations about how to address the interviewees.

The interview protocol that was used in this research, has been included in Appendix IV. During the first interviews, it became clear that a less structured, i.e. more semi-structured interview provided more insights in the matter, since it allowed interviewees more to express their view on the relationship between ICT and business in the organization. Nevertheless, the seven subjects of the interview protocol were covered in the twenty interviews.

Next to the interviews, information was collected through observation, and by reading related organizational documents on this subject.

4 RESULTS

Analyzing data from key informant interviews can be challenging. Responses from all interviewees on the same topics have been crosschecked with each other, as well as compared to data that was obtained from other sources. The question that has to be asked is whether the respondents' expertise or experience puts them in the position to know what they have stated in the interview.
In order to interpret the responses of the interviewees, the antecedents have been rephrased into statements. Most of the interviews have been extended conversations where diverse subjects have been discussed. The conversations have been analyzed and the key opinions of the interviewees about the different subjects have been summarized. These summary sentences are included in the tables in the following sections. The classification whether a respondents answers confirm or not confirm the statements are based on the full answers, since they should be seen in the context of the conversation. After combining the summary sentences, different subjects can be derived, which provides the coding for further analysis. This has been done via interpretative analysis.

4.1 COLLABORATION AND COOPERATION

Statement 1 ***The organizations environment is one of collaboration and cooperation***	**Total**
Interviewees confirming **1:** But mainly within the sector **5:** Internally the department focuses on collaboration. **10:** Cooperation is important. The organization has the tendency to form islands. Small size of the sector reduces this tendency. **13:** Cooperation between medical and other employees is better in some departments than in others.	**4/20**
Interviewees not confirming **2:** Not enough within the ICT department and not enough between business and ICT **3:** Gap between business and ICT, Island culture **4:** Every department has its own culture, ICT department has a complex structure **5:** Cultural differences between departments and between business and ICT. Business is missing cooperation from ICT. **6:** Organization-wide culture of autonomous decision making. Island-forming. Do not feel their department is part of constructive collaboration. **7:** Personal network is more important than official lines for collaboration. No ICT personnel available for business initiatives On departmental level improvements needed on cooperation between professionals and their staff. **8:** Physical distance between ICT and business creates a 'us vs. them' feeling. **9:** Culture of discussion and consultation, but not on cooperation. **11:** Ineffective collaboration between business and ICT. ICT employees do not want to work at the business side, because they would lose their ICT rights. **12:** Departments are like islands. **14:** Instead of an environment of collaboration and cooperation, there is an environment of imaging about whether people do the right things. **15:** There is also a sort of island culture between the parts of the ICT department. **16:** No clear coordination on where ICT requests should be placed. This hinders collaboration. Instead of a culture of working together, a political culture exists. ICT department is sometimes forced to solve issues they are not capable of solving.	**17/20**

17: Culture is not focused on collaboration, because there is no (or limited) communication between lower business levels and ICT. **18:** Cooperation is hindered by the physical distance between ICT and business. In some cases the business department is not easily approachable because of patient safety issues. **19:** Different perception of which projects should have priority, makes collaboration more difficult. **20:** Sometimes business does not use the agreed formal communication lines towards ICT. This hinders collaboration.	
No comments	**0/20**

Table 3 Results collaboration and cooperation.

Four out of the twenty interviewees expressed statements that indicate a degree of collaboration and cooperation in the organization. None of these statements, however indicate a complete confirmation that the organization is an environment of collaboration and cooperation. As one of the interviewees mentioned:"Every department has its own culture, its own environment within the hospital. (…) ICT has its own culture as well." (Interviewee 5)
The four 'confirming' statements are focused on collaboration within the respondents sector or within the respondents department. None of the confirming statements address a high degree of collaboration or cooperation between ICT and business entities.

Seventeen of the twenty interviewees provided notions opposing the statement that the organization is an environment of collaboration and cooperation. Sixteen of these respondents mention issues in cooperation and collaboration between the business and ICT. One of the respondents noted that an island culture hinders cooperation between departments.

The subjects for additional coding that can be derived from this summary are: 1. collaboration and cooperation within the sector; 2. collaboration and cooperation between business and ICT departments; 3. organizational culture; 4. collaboration and cooperation within departments.

4.2 Knowledge shared between business and IT personnel

Statement 2 ***Knowledge is shared between business and IT personnel on all organizational levels***	**Total**
Interviewees confirming **1:** Knowledge networks are formalized within the sector, between employees from different organizational levels. Knowledge sharing within the sector is perceived as very useful. **2:** Knowledge is being shared a few times a year between people on a higher organizational level. Within the sector, knowledge about ICT is being shared between Functional Network Administrators. Between sectors, knowledge should be shared by ICT Advisors. The sectors have a different interpretation of the role of the ICT Advisors, which hinders this knowledge sharing. **3:** The ICT Advisor is seen as the link between business and ICT. The ICT Advisor represents the sector towards ICT. Knowledge is shared between the ICT Advisor and business departments. **4:** A temporary network where knowledge is shared, identified ICT projects that can be terminated. Knowledge is shared on the highest organizational level. On lower levels there is also cooperation on this subject. **5:** Contact between business and ICT on lower organizational levels occurs mainly in projects. Knowledge sharing in projects is perceived as positive. **6:** ICT is looking for methods to gain more input from business in systems development. **10:** Knowledge sharing networks exist in ICT projects. Those networks should not be too large, because that leads to discussions without progress. ICT Advisors are seen as the interpreters for knowledge sharing between business and ICT. **11:** ICT Advisors have a weekly meeting where knowledge is shared about ICT initiatives. Most important goal of	**10/20**

these meetings is to prevent similar projects to start simultaneously.
Key-users are being used to share information from ICT towards business departments.
14: On higher organizational levels networks are formed to gain input throughout the organization for the development of ICT policies.
Knowledge is being shared across the organizations borders, with other (university) hospitals.
Knowledge sharing between organizations is seen as meaningful.
Knowledge sharing on a high organizational level.
20: Knowledge is shared on high organizational levels.

Interviewees not confirming	**15/20**
1: Knowledge sharing is not formalized between business and ICT. The connection between business and ICT is made when necessary. **2:** Physical distance between business and ICT hinders mutual learning. **3:** Does not recognize formalized methods for knowledge sharing. Does not know who to contact within the different parts of the ICT department. **7:** More knowledge sharing leads to greater understanding and reduces prejudices. Knowledge transfer should be improved. Business and ICT employees should be more interested in each other, to be able to understand their needs. More knowledge about ICT leads to greater understanding, which would reduce the 'gap' between business and ICT. Knowing who to contact is important for getting things done. **8:** The structure of ICT is unclear to business employees. Knowledge about the different ICT projects is diffused, which leads to inefficiency. **9:** ICT employees are eager to learn more about the business and their needs. However, opportunities and time for learning about the business is limited. **11:** No formalized networks for knowledge sharing, personal network is more important. There is a need for more training and education. There are only a few moments where ICT employees and ICT Advisors actually meet. There is a need for more contact between ICT advisors and (medical) employees. ICT Advisors are looking for methods to improve knowledge input from business. ICT employees that are working close to the workplace are motivated to solve problems. Distance between ICT and business reduces the sense of urgency. **12:** Medical employees have no knowledge about ICT and the ICT department. ICT and business do not know each other well enough. **13:** Supporting departments are not involved or consulted in decision making about ICT investments. **14:** Because of ignorance, business employees have a wrong perception of the complexity of ICT. **15:** Knowledge of the business about the ICT structure is limited. Knowledge is lost when employees leave the organization. There is a need for more documentation around ICT projects. **16:** Business lacks knowledge about how ICT works. Experiences are not being shared enough, but at the same time ICT in healthcare has become very complex. **17:** It is important to share knowledge on the lower organizational levels, because those are the people that do the actual work. Improvements can be made on knowledge sharing between lower levels in departments. Business is involved in knowledge sharing, but despite that, decisions are often made by a few individuals. **18:** ICT should know the limitations of this department. ICT must know what the needs of the department are. **19:** Unknown, unloved. Therefore ICT does not know what the business demands are. It is more important to involve people that are interested in ICT than to use official structures for knowledge sharing.	
No comments	**0/20**

Table 4 Results knowledge shared between business and IT personnel.

The degree to which knowledge is shared between employees from ICT and business on all organizational levels was measured. Out of the respondents, ten addressed the importance of shared knowledge or mentioned examples of situations where knowledge is shared. At the same time, fifteen interviewees expressed situations that indicates that improvements can be made on knowledge sharing. One of the interviewees underlined that by saying:

"I think that if we [business and ICT] should know about each other, some of the prejudices would disappear." (Interviewee 7)

The subjects for additional coding that can be derived from this summary are: 1. Knowledge sharing on strategic level; 2. Knowledge sharing on all organizational levels; 3. Knowledge of business employees about ICT; 4. Knowledge of ICT employees about business.

4.3 Prior experiences with IT projects

Statement 3 ***Prior experiences with IT projects and change initiatives are perceived as positive and successful by the organizations members.***	**Total**
Interviewees confirming **1:** Positive about ICT projects that are executed. More positive about ICT initiatives from business management level. **2:** In general not negative about the current ICT situation. **4:** Project management and project control is perceived as very positive. **5:** There are also positive experiences with ICT. The negative images stay with you the longest. **15:** There are a lot of ICT systems that work perfectly and never have problems. **19:** Positive about ICT and the ICT organization. **20:** Only a small percentage of the people in the organization are negative about ICT, but those people speak out more than others. Majority of employees are positive about ICT.	**7/20**
Interviewees not confirming **1:** Negative about the prioritizing of the central ICT department. Perceived as negative, because it is not what business wants. As a result, external experts are hired. **2:** Negative about coordination between ICT project managers. People that have a more central position in the organization have smaller amount of information on what is needed on operational level. **3:** ICT projects take too long, are suddenly terminated, or do not deliver what is wanted. Especially the duration is very obstructive. Quite negative image of ICT in the organization. Negative image leads to the creation of a separate ICT environment at departments. **4:** Limited contribution in time and effort of the business in ICT projects is seen as obstructing. **5:** ICT in the organization is not providing enough efficiency. In general ICT projects take too long. **6:** The way that the role of the ICT advisor is executed is not perceived as successful. A lot of things go well, but not on the most efficient way. **7:** The attitude of ICT employees towards the business in ICT projects is seen as negative. **8:** (Negative) image of the business about ICT projects is not quit fair. In ICT projects problem analysis is not executed well enough. **9:** In ICT projects problem analysis is not executed well enough. **10:** Failing ICT systems can potentially endanger patient safety. ICT technicians want to build beautiful products, but should focus more on what the business wants. Business has the image of ICT that they do not do the right things. This image is not quite fair. **11:** ICT projects are sometimes started through power play. **12:** ICT process is improving, but in projects time and budget are often exceeded.	**20/20**

13: ICT does not fit to the organizations needs.
14: In the organization there is a negative image of ICT, which is not completely fair.
15: The business has a negative image of ICT.
16: Talks about a gap between business and IT, but at the same time there are lots of connections and contacts towards ICT.
The image that the business has from ICT is negatively influenced by ignorance of the business.
17: Negative image about ICT. Improvements are needed.
18: ICT does not always match the needs of the business.
19: Improvements can be made on the speed of ICT systems.
20: The negative stories in the organization are about the speed of applications or application failures.
No comments **0/20**

Table 5 Results prior experiences with IT projects.

The degree to which the organizational members perceive their prior experiences with IT projects and change initiatives as positive and successful is measured, amongst others, by the stories that are told about ICT in the organization. Out of the 20 interviewees, seven people mentioned positive stories about ICT. All of the employees named situations that can be classified as negative stories about ICT. Often these are stories that are told by people in the organization, and not necessarily the respondents own opinion. A medical professional mentioned:

"In my experience this [image organizational members have of ICT] is very negative. (…) The system can fail, which means we can't access data. That is unacceptable! Secondly, progress on ICT innovation is too slow." (Interviewee 17)

The subjects for additional coding that can be derived from this summary are: 1. ICT project management; 2. Image of business employees about ICT; 3. Image of business involvement in ICT projects.

4.4 Executives form a guiding coalition

Statement 4 **Total**
The degree to which executives form a guiding coalition focused on collaboration, that shows rather than tells what the change is about.

Interviewees confirming **6/20**
2: Within this sector, there are good leaders and there is great solidarity amongst employees. New arrangements are made on leadership.
Leadership should be: visible leaders, high level of professional freedom, within the organizations limitations set by leaders.
The organization wide vision of the Board is clear.
There is more and more cooperation between Board of Directors and Sector Directors. And there is more and more vision coming from the Board of Directors.
3: Leadership between ICT and business is not focused on collaboration.
I am personally focused on showing rather than telling what change is about.
5: In the department, leadership is focused on collaboration.
10: Within the sector, a vision was created in cooperation with the employees from the sector. Other sectors have not done this.
14: A new organization wide vision and mission are being developed.
More and more the Board of Directors see the strategic value of ICT.
There is an ICT governance code which gives clear structure to the agreements that were made.
20: Organization wide vision on healthcare ICT has been developed with input from numerous employees throughout the organization.

The department heads (united in the 'Stafconvent') have a lot of power in the organization. The board of directors therefore look for close collaboration with the Stafconvent.
Leadership is about cooperation and working together: showing what you want to see by your subordinates.

Interviewees not confirming **20/20**

1: Laissez-faire leadership style. Is missing a clear ICT vision of the Board of Directors
2: Board of Directors sets the framework for ICT, at the same time there is a lot of freedom for the sectors. Sometimes agreements are not fulfilled.
3: Board of Directors should be focused more on steering ICT. A clear vision on ICT is missing. The board of directors do not enough support initiatives coming from business executives.
Organization wide vision has not been developed well enough. Can't tell exactly what the organization wide vision is.
4: Leaders should steer on results and a tight directive approach is needed.
5: Instead of collaboration, decisions are often made by power from higher hierarchical levels.
Board of directors need to be more directive towards the organization.
No clear vision from the Board of Directors.
6: Problems with ICT have to do with the fact that the organization does not make choices about ICT.
7: Does not know how the Board of Directors think about ICT and what the vision on ICT is.
Organization wide vision is not well known within the organization, has no influence on activities in the departments.
Leadership should me focused more on long-term goals instead of day to day issues.
This is improving the last few years.
8: Sometimes the Board gives directions that are not according to the deals that were made earlier.
9: People on the highest organizational levels should clarify the role of ICT in the organization.
10: On sector level, the tendency is to accept the decisions that are made central in the organization, as long as there is room for own initiatives concerning patient care.
An organization wide vision is needed, but is not yet determined. Choices have to be made for the future.
It would be helpful for ICT when the organizational goals are more clearly formulated, because ICT has to support these goals.
Leadership towards medical professionals is a highly political game, because you do not want them to resist to the proposal.
The organizations interests are not always central in the medical professionals mind. This hinders collaboration.
11: No agreement amongst executives on what the role of ICT advisor should be.
Strategic management is highly influenced by the power of the medical chiefs.
Need for a clear, organization wide vision on ICT.
Strong leadership should focus on trust on your team, commitment in the organization and translating that into a vision and policy.
12: Leadership in the UMCG is about listening and supporting professionals, then they will accept situations where things do not go exactly like they want it to go.
13: Small departments or sectors find it harder to find collaboration with ICT.
14: ICT keeps developing and the Board of Directors should realize that investments in ICT will have to continue.
15: Impression that Board of Directors is only interested in results.
16: ICT in the organization has become very complex, which leads to coordination issues.
Board of Directors needs more input on ICT issues, so they can make strategic decisions.
Signs that there is not a guiding coalition focused on collaboration.
17: Unclear how strategic ICT decisions are made.
Does not know what the organizations vision on ICT is.
18: Does not know what the organizations vision on ICT is.
Lot of different styles of leadership. In general authority is not the most suited style in the UMCG.
19: Leadership should be about clear boundaries and holding people accountable.
Assumes that the Board of Directors has a vision, but ICT does not need a vision, they need to be supporting the business.
20: Structure for decision making is formalized, however sometimes there is room to go around these structures.
In general this works well, however sometimes a decision is boycotted by a Director or a Department Head.
Problems often occur just before a proposition reaches the board of directors.

No comments	0/20

Table 6 Results executives form a guiding coalition.

The degree to which executives form a guiding coalition focused on collaboration, that shows rather than tells what the change is about, is measured by investigating, amongst others, the management styles that are being used, the organizations vision on ICT, and the support for ICT executives from top-management. All twenty respondents mentioned situations that are opposing the statement. Most of these quotations are about decision making in the organization and the struggle to find consensus about the direction ICT should go. Six situations have been mentioned that, to a certain degree, confirm the statement that executives form a guiding coalition focused on collaboration. Most of the interviewees, both confirming and not confirming the statement, noted that the involvement of top management in ICT related topics has grown in the recent history, as is underlined by the following example from a manager in one of the sectors:

"I do not have to invite the Board of Directors anymore [to discussion meetings about the sectors strategic plans], they want to be there to share their stories. (…) We want to achieve that for ICT as well." (Interviewee 2)

The subjects for additional coding that can be derived from this summary are: 1. Style of leadership; 2. Vision on ICT; 3. Freedom to deviate from ICT plans.

4.5 Strategic business plans and strategic IT plans

Statement 5 ***Strategic business plans and strategic IT plans exist and are congruent***	**Total**
Interviewees confirming **2:** In this sector, plans are adapted to the central ICT plan. Input from sector employees is used in the ICT plans **4:** ICT plans have existed over the years. Now, a vision on ICT is being developed, which is based on the organization wide vision. Strategic ICT plans are often influenced by external forces, like politics, customer demands, and ICT developments. Changing ICT is a driving force for change in the organization, but it is difficult to explain that to the business. An IT governance program has been developed to improve clarity about the role of ICT in the organization. ICT plans are developed by ICT and are shared with the Board of Directors and business Directors. **10:** Business has been consulted in the development of ICT prioritization plans. Next to that the business initiates own ICT projects, because the ICT department is too slow. **14:** A new strategic ICT plan is being developed. The board of directors is responsible for the decision making about the strategic plan. **16:** Business is involved in the development of strategic ICT plans. **20:** New ICT business plans are being developed in the organization. The board of directors usually accepts this proposal. The vision on healthcare ICT is very broad. We try to specialize this into clearer goals for our ICT.	**6/20**
Interviewees not confirming **1:** Assumes that there are strategic IT plans, but has no knowledge of them. **2:** There should be more clear agreements on the boundaries in which between the entire organization operates, so sectors are accountable. **3:** There is a need for more clarity about ICT plans and choices of the Board of Directors. **5:** Is not familiar with strategic ICT plans, but knows about demands that ICT projects have to meet.	**15/20**

6: There is no clear vision on ICT from the Board of Directors and ICT boundary plans are too broad. Therefore it is hard for ICT department to decide what they should do. **7:** ICT architecture has an influence on ICT plans, but ICT is not convinced of the added value. The ICT department is not always informed about changes in ICT policy. ICT is sometimes misused to force change in the organization. **8:** ICT projects should be based on business cases. Despite the fact that he does not directly need to know about the long term ICT vision for his job, he is missing it. **9:** The organization struggles with the translation of the organizations vision into concrete actions. **10:** The future of ICT in the organization is unclear, because of financial cuts. Board of directors should be more visible in steering ICT planning. **11:** No congruency amongst sector directors about the role of the ICT advisors. ICT advisors from the business are not involved in development of ICT vision. **12:** Does not know if strategic ICT plans exist. Feels that it is necessary to have a vision on ICT. **13:** Does not know about strategic ICT plans, but they're departmental plans are linked to the organizational goals. **16:** No clarity about who decides what. Strategic planning in ICT has not been at the attention of ICT personnel in the past. There has always been a lot of space to do things outside the UMCG goals and plans. **17:** There is a need for more clarity about what the ICT plans are, so the business knows why their wishes are not executed. **18:** Assumes that strategic ICT plans exist, but does not know them.	
No comments	**15, 19** **2/20**

Table 7 Results strategic business plans and strategic IT plans.

This factor is about the congruency of strategic business plans and strategic ICT plans. Not all of the interviewees were familiar with ICT plans in the UMCG. This partially explains that fifteen of the interviewees opposed that strategic business and ICT plans are congruent. A striking example of this was given by someone who has an consulting role for ICT support in one of the sectors:

"I assume that the Director of ICT has those plans. I do not have further knowledge of them." (Interviewee 1)

The six notions that confirm the statement were expressed by employees that are directly or indirectly involved in the ICT planning process. Those interviewees confirmed that there is an elaborate program for the development of strategic (ICT) plans. One of those respondents explained that the ICT department takes a leading role in that process:

"There are always two phases: ICT writes a proposal of plans for the next five years, which is discussed on the highest organizational levels. (…) The Board of Directors is responsible for the end decision-making, which results in a Masterplan ICT." (Interviewee 14)

In two of the interviews no information was shared that can be related to this subject. In one interview it became clear that the interviewee had no affiliation with the subject, and in the other case the subject has not been treated due to time issues during the interview. The subjects for additional coding that can be derived from this summary are: 1. Business knowledge about ICT plans; 2. Role of top-management in strategic ICT planning; 3. Development of strategic ICT plans.

Statement 6 ***Information exchange between business and IT departments is frequent, and: the degree to which communication styles used are appropriate.***	**Total**
Interviewees confirming **1:** Communication style is focused on cooperation and consensus. **3:** Communication is the base for change in the UMCG. **5:** Within ICT projects, there is information exchange between people involved. Information exchange helps to gain mutual understanding. **14:** More detailed information exchange is being constructed if necessary.	**4/20**
Interviewees not confirming **1:** Information exchange is not formally structured. It happens when necessary. **3:** Below the highest business level, there is no information exchange. There is not enough attention for the user's needs. **6:** On a strategic level, there is discussion about how the ICT organization should be arranged. There is no clear consensus yet. **8:** Bad communication between ICT and users. **9:** There is a language barrier between ICT and business personnel. **11:** Business find it hard to explain to ICT what their needs are. **12:** Communication between ICT and business is seen as poor. ICT advisors could play an important role in this communication. **13:** Every department has a high degree of freedom to chose its own direction. Communication between departments is therefore mostly about informing. **15:** Miscommunication between ICT and users on operational level. **16:** On strategic level, there should be more honest communication about the consequences of the decisions about ICT. **17:** There are especially differences in language between ICT and business employees. As a result, there is a distance between the two. **18:** There is not enough communication between business and ICT. Only in projects you can be informed about the possibilities and limitations of ICT. **19:** There is no such thing as a gap between ICT and organization. There is only a language barrier. **20:** ICT tries to inform the organization about ICT, but there is no formal information exchange between the two.	**14/20**
No comments **2, 4, 7, 10**	**4/20**

Table 8 Results information exchange between business and IT.

In literature, the importance of communication in business-IT alignment is mentioned. In the interviews, however, this subject did not lead to elaborated conversations. This explains why four interviews did not provide data that can be related to this subject. Next to that, the responses that were not confirming the statement that information exchange between business and IT departments is frequent and that styles used are appropriate, were diverse. A language barrier between ICT and business employees was often mentioned as a blocking factor for clear communication. One of the interviewees working in a medical department stated:

"The technical ICT language is like abracadabra to me. (…) I do not understand it, so I get distracted easily." (Interviewee 5)

In total 14 respondents expressed statements that were opposing the central statement. Four of the respondents

mentioned situations that confirm the importance of clear communication about ICT.

The subjects for additional coding that can be derived from this summary are: 1. Information exchange; 2. Language barrier; 3. Communication on all organizational levels.

4.7 Accept, embrace and adopt IT initiatives

Statement 7 ***Organizational members are willing to accept, embrace and adopt IT initiatives.***	**Total**
Interviewees confirming **14:** In general there is a high level of change readiness in the organization. Especially when change is triggered through own initiative. Forced changes are always harder to accept. **18:** Involving people in the change is often the most successful approach to reducing resistance.	**2/20**
Interviewees not confirming **1:** The organization is too big and there are too much different types of people in the organization to say something in general about the change readiness of the organization. **2:** Difficulties with changes highly depend on the specific situation. Right now, I need the financial cuts to change things around here. **3:** The organization struggles with changes. That has to do with the culture of the organization. There has never been a lot of urgency to change, until now. There is resistance to change. Communication is the key to overcome resistance to change. **4:** The political nature of the organization hinders change readiness of the organization. The power of the medical professional is big. Changing ICT is a driving force for change in the organization, but it is difficult to explain that to the business. **5:** We are forced to change, but it is hard to meet to this changes, decision makers are not conscious of the consequences on department level. I am convinced that change is necessary, but not the proposed changes. **6:** The sense of urgency for change in the organization is not felt, because people on the workplace make sure it does not fail. **7:** Changes on business level are often forced through power play. **8:** Medical professionals have a high loyalty towards the patient and not primarily to the organization. **9:** It is hard to say anything in general about the change readiness, except that it is a large organization and therefore slow in changing. **10:** The medical professionals are a group of employees with a high level of influence in the organization. This group of people is often a force of resistance to change. **12:** It is especially hard to get all medical professionals facing the same direction. **13:** The department has developed a more hesitant attitude towards new projects. **15:** Change can only be forced, because there are always people resisting to new initiatives. **16:** Change is slow in general here. A decision is often the start of the discussion. The sense of urgency is increased by the current layoffs. **17:** There is no room for change initiatives with bottom-up initiatives. **18:** Change is in general slow in this organization. There are different ways to guide change initiatives. Sometimes through authority, sometimes through consultation. **19:** This is a very large organization. Therefore, change is difficult. **20:** Not only is there a lot of resistance to change, there are many processes that cannot easily be compared. That makes changes go slowly. You can't change a large organization at once, but only through small steps. This is a very complex organization, and there are lots of different interests groups.	**18/20**

No comments	**11**	**1/20**

Table 9 Results accept, embrace and adopt IT initiatives.

The state of change readiness of the organization has been measured by the degree to which organizational members are willing to accept, embrace and adopt IT initiatives. Two of the respondents mentioned that the organizational members are willing to accept new initiatives. At the same time, eighteen of the interviewees described situations where the organizational members struggle with ICT or change initiatives. Next to social aspects of change readiness, e.g. sense of urgengy and willingness for change, the size of the organization was mentioned as a hindering factor. The following quote from one of the interviewees underlines this:

"It [slow change] has to do with the size of the organization. (…) There are a countless number of unrelated processes that do not seem to have an interrelation. (…) Processes are slow, and there are a lot of people who are able to say something about it." (Interviewee 20)

One of the interviews did not provide usable data for the central statement.
The subjects for additional coding that can be derived from this summary are: 1. Readiness for change & sense of urgency; 2. Power of professionals; 3. Organization size.

4.8 Summary table

Every interviewee has their personal associations with the subjects that were discussed in the interviews. Nevertheless, after the summarization of the responses, it became clear that they could be categorized in three or four subcategories per antecedent. Those subjects have been given an additional coding in order to analyze them in more detail in the discussion section of this paper.

The interviewee responses have been qualified as being positive or negative about the sub-category. In some cases the interviewees expressed both positive and negative comments regarding certain categories. All of the analyzed responses have been summarized into categories for additional coding. An overview is displayed in the following Table 2.

First analysis of the table shows that there are no significant differences between the responses from ICT employees and business employees. In addition, the organizational level an interviewee operates on does not seem to influence the kind of response an interviewee provides, except on categories that are related to a specific organizational level. Both findings validate the proposition that the interviewees are key-informants in the organization about the researched topic.

Further analysis of the table is done in chapter 5. It has to be taken into account that the number of interviewees and the research methods used would not justify deriving strict and representative statistics from this table.

		Business										ICT									
		Strategic			*Tactical*		*Operational*					*Strategic*			*Tactical*				*Operational*		
Code	**Variable**	**2**	**10**	**12**	**3**	**7**	**5**	**13**	**17**	**18**	**19**	**4**	**14**	**20**	**1**	**6**	**11**	**16**	**8**	**9**	**15**
1.1	Col. & coop. within the sector.														+						
1.2	Col. & coop. between business and ICT	-				-	-		-	-	-		-	-			-	-			
1.3	Organizational culture		+	-	-		-					-				-		-	-	-	
1.4	Col. & coop. within department	-				-	+	+													-
2.1	Knowledge sharing on strategic level	+										+	+	+	+						
2.2	Knowledge sharing on all organizational levels	+/-	+		+/-	-	+/-		-			+/-			+		-	-			
2.3	Knowledge of business employees about ICT			-	-	-							-				+	-	-		-
2.4	Knowledge of ICT employees about business			-				-		-	-					+/-	-			-	
3.1	ICT project management	-		-	-		-					+			+		-		-	-	
3.2	Image of business employees about ICT	+	-		-	-	+/-	-	-	-	+/-		-	+/-	-	-		-	-		+/-
3.3	Image of business involvement in ICT projects											-						-			
4.1	Style of leadership	+			+		+			-	-	-		+				-	-		
4.2	Vision on ICT	+	-		-	-	+		-	-	-		+/-	+	-	-	-	-			-
4.3	Freedom to deviate from ICT plans	-	-	-			-	-						-			-			-	
5.1	Business knowledge about ICT plans			-			-	-	-	-					-			+			
5.2	Role top-management in strategic ICT planning	-	-		-							+				-			-		
5.3	Development of strategic ICT plans	+	+			-						+	+	+			-	-		-	
6.1	Information exchange				+		+						+	-	-						
6.2	Language barrier								-		-						-			-	

		Business										ICT								
		Strategic			*Tactical*		*Operational*					*Strategic*			*Tactical*				*Operational*		
Code	**Variable**	**2**	**10**	**12**	**3**	**7**	**5**	**13**	**17**	**18**	**19**	**4**	**14**	**20**	**1**	**6**	**11**	**16**	**8**	**9**	**15**
6.3	Communication on all organizational levels			-	-			-		-					+	-		-	-		-
7.1	Readiness for change & sense of urgency	-			-	-	-	-	-	+/ -			+	-		-		-			-
7.2	Power of profes-sionals		-	-								-							-		
7.3	Organization size										-			-	-					-	

Table 10 Summary of interview results.

\+ The interviewee perceives the factor as a positive influence.

\- The interviewee perceives the factor as a negative influence.

Interview did not provide information on the subject

5 Discussion

The data from the interviews shines a light on the antecedents to business-IT alignment. The reason for executing this research in the UMCG is that the organization agrees that there are issues on the area of business-IT alignment. Therefore, the situation at the UMCG is an interesting environment to test the antecedents to business-IT alignment in practice and to compare the situation to the ideal situation as constructed in literature. From the analysis, some propositions can be drawn that focus on antecedents or potential inhibitors of business-IT alignment in practice.

5.1 Organizational culture

The general image coming from the interviews is that improvements can be made on de degree to which the organization is an environment of collaboration and cooperation. In the interviews the image of an island culture was often mentioned. This image contains the characteristics that formal and informal clusters are formed between people, departments, or sectors, which have a protectionist stance towards other entities in the organization. This protectionist attitude is in contrast to the ideal situation as presented in literature. The interviewees mention the importance of collaboration and cooperation between business and ICT departments.

For example, an ICT employee on tactical level mentioned:

"Most ICT employees are positioned far away from the core business. They make assumptions, but often do not really understand the issues on the operational level. (…) We have to work closer together, in order to improve mutual understanding." (Interviewee 11)

Next to that, some interviewees talked about collaboration and cooperation within the department or within the sector. Cooperation on those areas is needed to jointly formulate ICT demands for the sector and departments. The ICT department needs this input to be able to support the business processes. This relates directly to the notions made in the literature section of this thesis, where Reich & Benbasat (2000) stated that in information systems development, a major cause of failure can be subscribed to differences in culture between IT and business members.

In the interviews, the difficulty of changing an organizations culture was mentioned. The installation of ICT steering committees was one of the solutions at the UMCG to overcome alignment issues. However, as was mentioned before, according to Chan & Reich (2007) this is not enough. The absence of a CIO in the organization, is a notable given as well, and was subject of discussion in some interviews. Also the invisibility of the IT staff, communication barriers, history of IT/business relationships, attitudes of organization members to IT, shared domain of knowledge, and leadership have been discussed in the interviews. How this looks in practice is illustrated by a medical specialist who stated:

"I don't know who to talk to [about ICT related topics]. The only thing I can do is call the ICT helpdesk when my computer is running so slow again that I can't get to the required data. But in the end I have some ideas about developments that would help us a lot. (…) I do not know where to go with these ideas." (Interviewee 17)

In the UMCG the importance of collaboration is demonstrated. Because of these findings, the supposition that culture is a part of the business-IT alignment dilemma, is confirmed. This leads to the following propositions:

Proposition 1: Cultural differences between ICT and business departments are a reason for failure in business-IT alignment.

Proposition 2: A culture of cluster forming with a protectionist attitude is hindering business-IT alignment.

5.2 Shared knowledge

From the interviews the image comes forth that knowledge sharing is mainly constructed on high organizational levels. On the lower organizational levels, knowledge sharing

seems to be less formalized. At the same time, both ICT and business interviewees state that the knowledge of business employees about ICT and the ICT employees knowledge about the business can be improved. Four themes about knowledge sharing come forward from the interviews.
The first subject is knowledge sharing on strategic level. Both ICT and business interviewees on strategic level addressed the importance of close cooperation and knowledge about each other's domains. Top managers' knowledge of ICT is mentioned as a point of attention, and was seen as a hindering factor in the past. However it seems that there is a growing sense of the importance of ICT in the organization, and in the interviews growing attention for ICT from the Board of Directors was mentioned. The most significant example of knowledge sharing on strategic level are the steering committees: Healthcare Computerization and Research Computerization. In these steering committees executives from diverse departments on both business and ICT are represented. The committees are responsible for strategic decision making about ICT projects. Knowledge sharing on all organizational levels is a theme where more diverse conversations arose from. The general view that can be derived from the interviews is that people perceive knowledge sharing within their department as occurring and important. At the same time, a shared knowledge area between ICT and business employees is not recognized, unless temporarily in ICT related projects. In those cases knowledge sharing is perceived as very contributive to shared understanding. Since knowledge sharing is formalized on the higher organizational levels, e.g. in the steering committees, the image comes forth that information exchange between business and ICT mainly exists through the formal hierarchical lines and less directly between the employees involved. This is underlined by an employee on operational business level who noted that for information about ICT initiatives he depends on the information that is shared his superiors:

"If you want the patient to get well, make sure you support my work, because I am the person that treats the patient. You should not ask my manager, who rarely sees patients, what I need." (Interviewee 17)

The last two themes are the knowledge of business employees about ICT and the knowledge of ICT employees about the business. Both ICT employees and business employees stated that there is little knowledge sharing on both fields.
One difficulty of measuring knowledge sharing, is that the interviewees could not easily imagine how knowledge sharing should show in practice and on what areas knowledge sharing is needed. One interviewee (ICT employee, tactical level) illustrated that by stating:

"When you need to communicate with people from other departments, you do. Within the ICT pillar this is formalized and then people find it useful." (Interviewee 1)

Despite that remark, the characteristics of shared knowledge were mentioned in some of the interviews. The importance of communication, shared language and shared understanding has been mentioned and according to the interviewees improvements can be made on those areas. Therefore, this research seems to confirm that knowledge sharing is an antecedent to business-IT alignment.

Proposition 3: Knowledge sharing on strategic level is positively related to alignment.

Proposition 4:Knowledge sharing on all organizational levels is an antecedent of business-IT alignment.

Proposition 5: A lack of knowledge of business employees about ICT and of ICT employee about the business is hindering alignment

5.3 Prior experience with IT

Literature showed that successful previous IT projects are an antecedent to IT alignment. The attitude towards IT change projects can be identified by the stories that are being told in the organization. Therefore, this assumed antecedent of business-IT alignment is mainly about the imaging of ICT. One risk of questioning employees about this subject is that they use the subject mainly to express discontent about ICT. The results show that all of the interviewees mention that negative stories are being told about ICT in the organization. The interviewees mentioned that

ICT system failures in particular have had a negative influence on the image organizational members have from ICT and the ICT department. A medical professional stated:

"The system can crash and then we cannot get to our data. It happened again not long ago. That is unacceptable." (Interviewee 17)

At the same time, it has to be recognized that most interviewees wanted to state that their experiences are not only negative. This showed in statements like:

"A lot of things go well, and therefore you will never hear about them." (Interviewee 15)
And:
"I do not want to be just negative about ICT, because I have some good experiences as well, but negative images stay with you longest." (Interviewee 5)

Three other themes are extracted from the interviews. The first theme is ICT project management. The stories about ICT projects coming from business employees in the organization are mainly stories of failure. ICT employees tell more positive stories about project management, however at the same time they recognize the stories of ICT projects told by other organizational members. Those stories often contain the image that projects take too long, do not always have the result that was wished for by the users, and that communication about projects should be improved.
The second theme, derived from the interviews is about the general image business employees have about ICT. As was mentioned before, ICT systems failure have had a considerable negative influence on this image. Furthermore, interviewees mentioned that the speed of computers and ICT applications in general is a widespread factor for frustration in the organization.

The last theme was mentioned by two ICT employees who stated that the business should be more involved in ICT projects. The availability of business employees is seen as an obstructing factor to successful cooperation in projects. In this context, it is important to mention one of the interviewees remarks about the image employees have from ICT in the UMCG. The interviewee states that the majority of employees do not have a negative image about ICT, and that it is only about twenty percent of the employees that find ICT does not support their needs or that ICT developments are going too fast. On the first hand, this statement seems to contrast the outcome of all the interviews combined, where all the interviewees mention negative stories about ICT. This difference can be explained by the fact that the researched factor focuses on the image making about ICT and not on the number of people who actually feel a certain way. Taken that into account, it can be concluded that in general the image about ICT in the UMCG is perceived as negative.

Proposition 6: Negative image of previous ICT projects is a hindering factor for business-IT alignment.

5.5 Leadership

Leadership was defined in the literature section of this thesis as the degree to which executives form a guiding coalition focused on collaboration, that shows rather than tells what changes are about. In the UMCG leadership has often been subject of discussion and leadership training programs have been held throughout the organization. Despite that, the respondents highlight different aspects of successful leadership in the UMCG. The interviewees mentioned that leadership should be: focused on collaboration, visible leader, high level of professional freedom, more directive steering, following up on agreements, listening, supporting professionals, and showing rather than telling.
In literature, the importance of the cooperation between business and ICT executives for alignment is addressed. Not all of the interviewees had a clear view on the situation of this factor in the UMCG. Only the business and ICT employees operating on strategic level could provide insight in the relationship between business and ICT executives. Though this is an understandable given, this makes it more unlikely that a guiding coalition focused on collaboration is present in the organization.
The interviewees from lower organizational levels, characterized leadership in the organization more in terms of vision, style of leadership and the degree to which authority is in play. In general, a clear vision from the Board of Directors on ICT is being missed according to most of the interviewees. At the same time, a vision on ICT has been developed and made public to the organization. It seems to

be that most of the employees in the UMCG have no knowledge about those vision documents.
Next to that, some interviewees mentioned that there is room to deviate from plans that were agreed upon earlier. This is seen as hindering cooperation and can be viewed as an example of poor leadership. A statement from a member of the Board of Directors a few years ago about decision making in the UMCG was quoted or recognized by most of the interviewees:

"Too often a decision in this organization marks the start of the debate." (Member of the Board of Directors)

Therefore some of the interviewees state that leadership in the UMCG should be about tighter steering and holding people accountable. A theme that is related to that last finding, is the division of power in the organization. Formally there is a clear structure of power in the organization, which is represented by the organizational chart. In practice however, informal power has an significant influence on leadership. Medical professionals play a vital role in the organization, which makes the organization dependable on this group of employees. The chiefs of the medical departments, who are collectively united in the 'Stafconvent', have a high degree of influence on the decision making on strategic level in the organization. The Board of Directors looks for close cooperation with the Stafconvent. At the same time the Stafconvent does not have the same set of interests as the Board of Directors. Especially in the context of ICT strategy, the interests of the different stakeholders involved differ. Therefore, the power of medical professionals can become a hindering factor for leadership in the organization.

In conclusion, there is no clear congruency of what leadership should look like in practice. Hence, it is unlikely that a unified vision on ICT coming from leaders in the organization is perceived as such by the organizations members.
Proposition 7: The absence of a guiding coalition of ICT and business executives is a hindering factor for business-IT alignment.

Proposition 8: The perceived lack of vision on ICT by organizational members is negatively influencing business-IT alignment.

Proposition 9: The freedom for organizational members to deviate from ICT plans is hindering business-IT alignment

5.6 Planning processes

The antecedent of the planning process is about the congruency of business and ICT plans. On the forehand, it can be expected that not all of the interviewees have knowledge of these plans. This showed in practice as well. In some of the interviews it became clear that the interviewee could not provide information about this antecedent. Six other interviewees themselves expressed that the business employees lack sufficient knowledge about ICT plans.
It was mainly interviewees on the level of policy making who could provide information about the existence of ICT and business plans. The development of strategic plans is done by the allocated departments. It is presented as an advice to the Board of Directors. The interviewees mention that nowadays, more than in the past, employees throughout the organization are involved in the development of strategic plans. It is the Board of Directors that is responsible for strategic planning and for the congruency of those plans.
This role of top-management in strategic planning was mentioned by some of the interviewees. Critics say that the underlying goals of strategic ICT plans are not clear; the vision behind it is missed. Besides that, the interviews show that there is no congruency in the organization about the way strategic (ICT) plans should be translated to practice. Two examples that were given of this are firstly the role of ICT advisors in the different organizational sectors, and secondly the role of the FGB department in the organization. About the former, one of the ICT advisors stated that originally the function of the ICT advisors was to translate the business needs to the ICT department. However, as the advisor mentioned:

"Every sector has its freedom to design their own structure, so in practice the role of the ICT advisor is different in every sector." (Interviewee 7)

In summary, it becomes clear that strategic ICT and business plans do exist and that the Board of Directors sees to the congruency of those plans. At the same time, large part

of the employees of the organization do not have knowledge about these plans and there is room to deviate from the plans. This leads to the following proposition.

Proposition 10: Employees lacking knowledge of the vision and strategic business and ICT plans is a hindering factor for business-IT alignment.

5.7 Communication

Though communication is highly interrelated to the other antecedents, in literature it is mentioned as a separate antecedent to alignment. The importance of communication was shared by the interviewees. One difficulty of measuring this factor is that each interviewee has a different relationship towards ICT. Therefore there is little unity in what the answers of the interviewees are about. Still, some important notions can be derived from the interviews.
Knowledge between business and ICT employees is mainly exchanged in ICT projects. This information exchange is perceived as positive and important. There is no formalized structure for communication, or as one of the interviewees stated:

"It happens when necessary." (Interviewee 1)

On top management level, communication between business and ICT executives is regularly constructed. According to the interviewees involved, this communication has a strategic nature. Communication is not frequent on all organizational levels. The main tendency on lower organizational levels seems to be that communication around the user's ICT needs is perceived as insufficient. Some business interviewees stated that ICT does not listen to their needs, or that ICT sometimes does not follow up on requests that were done. At the same time, ICT interviewees mentioned that the business demands are often unclear and that the business find it hard to explain what their ICT needs are. Furthermore, some interviewees mention that there is a language barrier between ICT and business personnel. This is seen as a hindering factor for clear communication.
The second part of the definition on communication, as was defined in the theoretical section of this thesis, is the degree to which communication styles used are appropriate. The interviews did not provide enough information about the used communication styles to draw conclusions from. The fact that the interviewees did not make remarks on issues with the communication styles could indicate that the styles that are used are appropriate. However, there is no data to substantiate that idea. One of the interviewees did however mention that there is a lack of honest communication about the consequences of ICT decisions.

Proposition 11: Frequent communication on all organizational levels is an enabling factor for business-IT alignment.

Proposition 12: A language barrier between business and ICT employees had a negative effect on alignment.

5.8 Change readiness

Most of the interviewees identified that there are issues with change readiness in the organization. The reasons that were given for these issues were diverse. Some interviewees stated that there are too much different people working in the organization to say something in general about the change readiness of employees. Two other interviewees experienced that their collogues were open to new initiatives, and they perceived the organization as an environment for innovation.
Other respondents mentioned that in the past, there had not been a sense of urgency for change. Two reasons for that were given. Firstly, in the past there was enough financial funding for custom made ICT solutions. Therefore, according to the interviewees, there was always room for new projects. Secondly, it was mentioned that the sense of urgency was not felt, because people in the workplace do not let things go wrong. Most interviewees agree that there is an increasing sense of urgency today, because of financial cuts in the entire organization. Some projects are being aborted and there have been layoffs.
This research focuses on the social factors of change readiness. Despite that, some interviewees mentioned that change in the organization is slow because of the organizations size. One of the respondents stated that there are many different processes that cannot easily be compared, and that besides that there are lots of different interest groups in the organization.
One interest group that seems to be the most influential on change readiness is the group of medical professionals.

Four of the interviewees mentioned that medical professionals are a group of people with a high level of influence in the organization and that it is hard to get all of them facing the same direction. One of the interviews that can be classified in the group of medical professionals, agreed on that image. The respondent stated that to overcome this resistance it is important that ICT systems support the professionals as much as possible in their day-to-day activities.

Proposition 13: The power of individual professionals is seen as a hindering factor in alignment efforts.

Proposition 14: A sense of urgency is needed for business-IT alignment initiatives to be successful.

Proposition 15: Change readiness is a factor enabling business-IT alignment

5.9 Additional information

All interviewees were asked whether the antecedents that are dealt with in this study are representative for the situation in the organization. There were no indications from the responses that this is not the case. By the confirmation of all the interviewees the results as discussed above are validated. The most significant proof for the propositions posed in this thesis is the fact that the interviewees were able to relate to the subjects given that they work in an organization that is struggling with its business-IT alignment initiatives.
Furthermore, the interviewees were asked whether there are other factors that had not been treated yet, but are important to business-IT alignment. Most of the responses to that question could be returned to one of the existing antecedents. The remaining responses can be summarized in two categories. The first category is about the financing of ICT in the organization. Limited funds put pressure on the range of possibilities in alignment initiatives. In that sense, the degree to which budgets are available could be an antecedent for business-IT alignment. The second category can be defined as training and education. Two interviewees mention that too little attention is given to train employees to make full use of the ICT possibilities in the organization. The degree to which employees are trained to work with ICT systems and applications could therefore be an additional antecedent for alignment.
Both categories have not been further investigated in this research. Therefore, further theoretical and empirical research should identify whether these categories are antecedents to alignment

6 Conclusions

In this research seven antecedents have been used to describe business-IT alignment. Each of the antecedents has been investigated separately, but at the same time they are highly inter-related. For example, cooperation and collaboration is closely related to the sharing of knowledge; the employees willingness to accept new ICT initiatives is influenced by their experiences in the past; leadership in terms of vision on ICT from executives in the organization highly influences the content of ICT plans and business plans; and those are just a few of the many connections between the antecedents. To get a better insight in business-IT alignment, the antecedents have been separated in this research. Nevertheless, in practice it is important to acknowledge their interrelations.

Since the antecedents are highly influenced by each other, it would not be proper to state that one is more important than the other. However, in the interviews some of the antecedents were mentioned more often by the interviewees and led to more elaborate conversation than others, namely: knowledge sharing, prior experience with ICT, and leadership. This could imply that these topics are of higher relevance than others. Two remarks must be made in that context. The first one is that these topics are possibly only of higher relevance to the UMCG case and to a lesser extent, or not, to other organizations. The second remark that must be made is that the (unconscious) bias from the researcher influences the duration a subject is discussed in the interview. Though it seems like this effect has only a minor influence on the results of this study, it has to be taken into account when analyzing the data. Further research should determine whether these antecedents are actually of higher relevance to business-IT alignment.

6.1 Contributions to theory

The most important theoretical implications of this research, must be seen in the light of the related theory as presented in the literature section of this paper. This research gives an overview of the different views on business-IT alignment as used by authors, and relates those to the dimensions related to organizational change. Examples of similar comparisons have not been found in literature. The fifteen propositions provide concluding remarks to the insights that were provided by the interviewees. The interviews appear to confirm the validity of the antecedents as presented in literature, thereby adding legitimacy to the antecedents as presented in literature.

The concept that business-IT alignment and change management use similar concepts and are interrelated lies at the base of this study, but has not been investigated thoroughly in extant research. By integrating both in this study, this interrelation is shown in the practice of a complex, political organization. Where existing theory often perceives of business-IT alignment as a desired end state (e.g. Luftman, 2000; Preston & Karahanna, 2009; Teo & Ang, 1999), this research acknowledges that the view of business-IT alignment as a process of change over time is more appropriate. Therefore, instead of presenting (an adaption to) a strategic alignment model (SAM), an insight is given in the factors that influence the alignment process and their relationship to organizational change. By showing the interrelation of both subjects, the legitimacy to further investigate business-IT alignment as a change process is strengthened. In extant literature this view is not yet widely accepted.

6.2 Contributions to practice

Practitioners of ICT related subjects in organizations could benefit from this research as well. In the UMCG, business and ICT managers and executives should become familiar to the concepts used in this thesis. Most important is the realization that business-IT alignment efforts will not lead to an 'end state', where the organization and it IT processes are completely aligned. Actually, the level of alignment is constantly changing, caused by changes in the dynamic environment today's businesses operate in. Therefore, the level of alignment should be monitored and adaptations are needed regularly.

Practitioners in the UMCG could benefit from this research by adopting the propositions that were posed in the discussion section of this paper. In particular on strategic level,

there should be more clarity on the role of ICT in the organization. The design of the ICT (related) departments as well as practical ICT solutions should be the derived from the organizations vision on ICT, and not from individual departments defining their own role in the organization. There is too little congruency amongst employees throughout the organization on some basic, strategic, ICT related questions, such as: should ICT be only supportive to the business, or can it have a leading role through (technological) innovation? In more general terms, the strategic role of ICT in the UMCG is unclear to a significant part of the employees.
Practitioners of ICT initiatives in other organizations can learn from this example that a clear vision on the role of ICT in their organization and communicating about that vision is important for business-IT alignment.

In more detail, this research shows the need for an organizational culture focused on collaboration and cooperation. The UMCG should enhance initiatives for improving cooperation between departments. At the same time there is an individual responsibility for all professionals to adopt a broader perspective, outside the boundaries of their own departments, and take the organizations interests more into account. Leaders in the organization must stimulate that perspective, by i.a. leading by example.
Furthermore, the sharing of knowledge between business and ICT employees should be improved. Increased knowledge of another field of expertise will take away a lot of the prejudices that exist about ICT and about medical departments. A negative image of previous ICT initiatives has been found to be obstructing to business-IT alignment in the organization, whilst this image is justified by failing project management or incompetency of the ICT department. It can however for a large part be explained by wrong perceptions business employees have of the possibilities and limitations of ICT. Therefore there should be more honest and open communication about those ICT possibilities and limitations. Equally important is the willingness and the availability of medical personnel to learn about ICT and to take extra effort in clearly formulating their needs and requirements. Training and education can be one part of the solution, the identification and involvement of key-users in the organization with an above average affinity with ICT can be supportive to the solution as well.

In the practice of the UMCG, the relationship between business and ICT is often perceived as a business to customer relationship by the ICT department. Two remarks can be placed with this image. First of all, business employees are not aware of this perception, so (at least in theory) they do not know that they should behave accordingly towards ICT. Secondly, and more importantly, there are some assumptions related to this image that are appear not to be true in practice. For example, the image in the UMCG assumes that the client knows which solutions suit their situation best, and that the client has the authority to make the associated budget decisions. Both assumptions are often false in the practice of the UMCG. Therefore an environment of cooperation and collaboration seems to be a better paradigm, or at least a business to customer relationship should be a professional relationship focused on working together. Some of the interviewees stated that for a large part this issue could be solved by clear communication about the mutual expectations. At the same time, the need for a more open organizational environment where cooperation is paramount remains.

Going towards such a different organizational culture can be challenging. Organizations in general often struggle in achieving such a cultural change. This research identified the organizations readiness for change as a factor that is in play. Since business-IT alignment is an ongoing process and is subject of continues change, the UMCG should address the identification and discouragement of change inhibitors. Executives in the UMCG can play an important role in that process, first of all by the development of congruent strategic business and ICT plans, secondly by honest and clear communication about those plans, and thirdly by forming a guiding coalition focused on collaboration, that shows rather than tells what the change is about. More specifically, this research indicates that the organizational size and the power of professionals are inhibitors of change.

For employees of the UMCG who are involved with business-IT alignment initiatives, it is important to take a final notion in mind: in the interviews it became clear that this topic is more in play now in the organization than it has been before. Employees from both business and ICT departments appreciate that initiatives for improvement are taken on this subject. Furthermore, the importance of - and

the dependency on - high quality ICT is recognized by top-management more than it has been in recent history. Therefore, it seems that the time is right to give the subject of business-IT alignment a prominent place on the organizational agenda.

6.3 Limitations & Further research

The antecedents in this study are based on other studies and existing literature. Nevertheless, the conceptual model as presented in this thesis is tested in one organization. Therefore, the same study should be performed in other organizations to validate the findings as presented in this research.
Some other limitations to the generalization of the outcomes of this study can be found in the methods used. Firstly, the conceptual model is being tested by a relatively small group in a large organization by performing interviews. An organization wide survey would provide insight in the degree to which the outcomes can be generalized. Secondly, the design of this study provides some challenges that have to be taken into account. Theory has been the fundament of this study and was a guideline for the interviews. Therefore, the researcher approaches the data with an informed but, nonetheless, strong bias (Hsieh & Shannon, 2005). Using this method, it becomes more likely for the researcher to find evidence supportive rather than non-supportive of the theory. Therefore, this study would be more valid if the outcomes are investigated further in a broader study, and when the underlying theory is being reviewed by auditors.
Furthermore, during the first interviews it showed that a strict compliance to the interview protocol did not lead to elaborate conversation. In the light of this study however, a broad image of business-IT alignment in practice discussed by the interviewees was more important than the strict answering of the questions posed in the interview protocol. Therefore, a less structured interview style was adopted in order to enhance conversation during the interviews. All interviews were however steered in a way that the related topics were treated.

Following this research, further investigation should focus on the conceptual thought that by investigating business-IT alignment as a process of change, the organizations readiness for change is investigated simultaneously. In Chapter 6.8 two potential antecedents, derived from the interview data, were mentioned that could benefit from further research: the financial situation of the organization, and training & education.

An additional note that can be made in that context is that this research contributes to existing theory, by investigating the social or human factors of change management. However, some of the interviews identified that other types of change related factors, e.g. related to the organizational size or structure, are influential to business-IT alignment as well. Though this finding could be expected on the forehand, it has not been part of this study. Further research should take those other factors into account as well.

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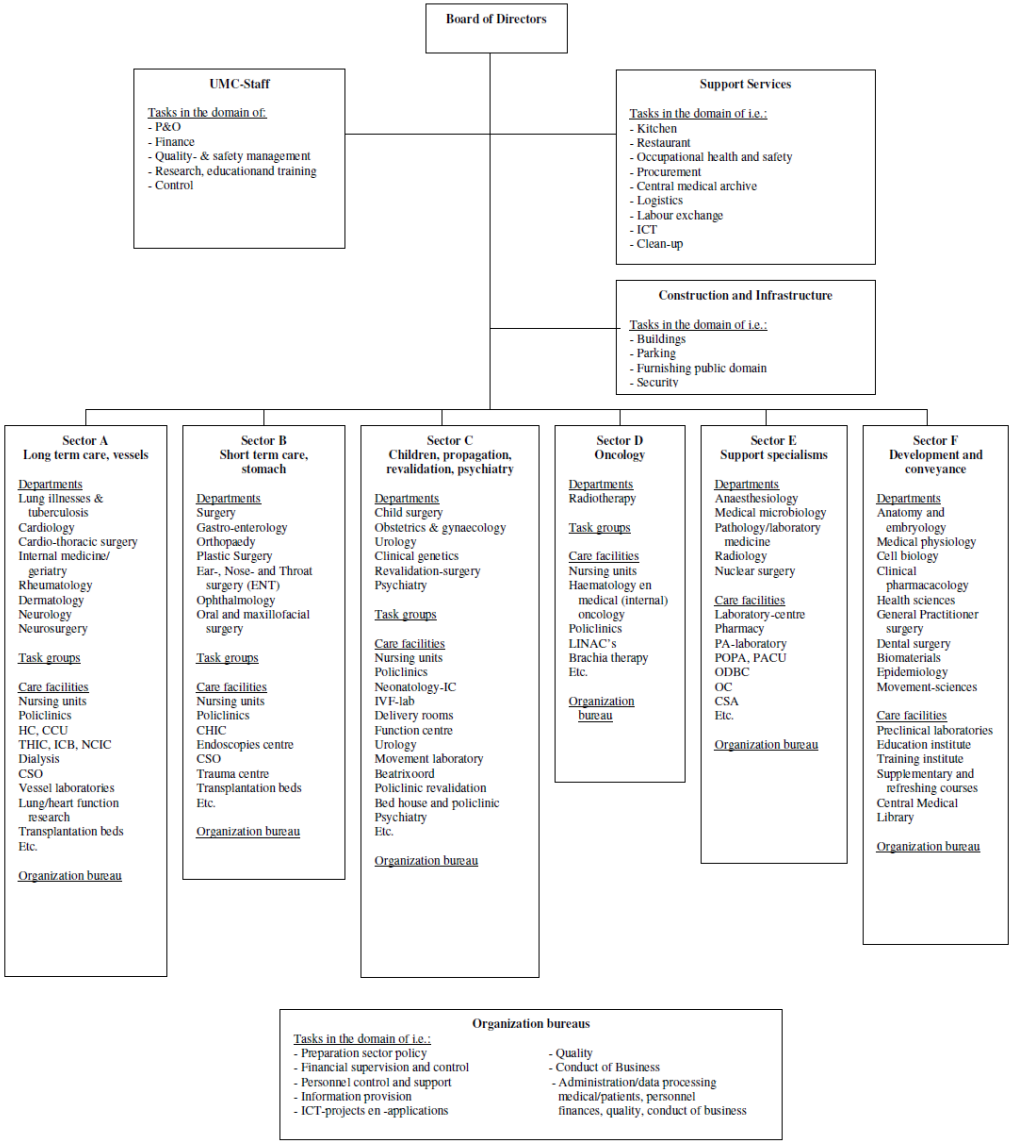
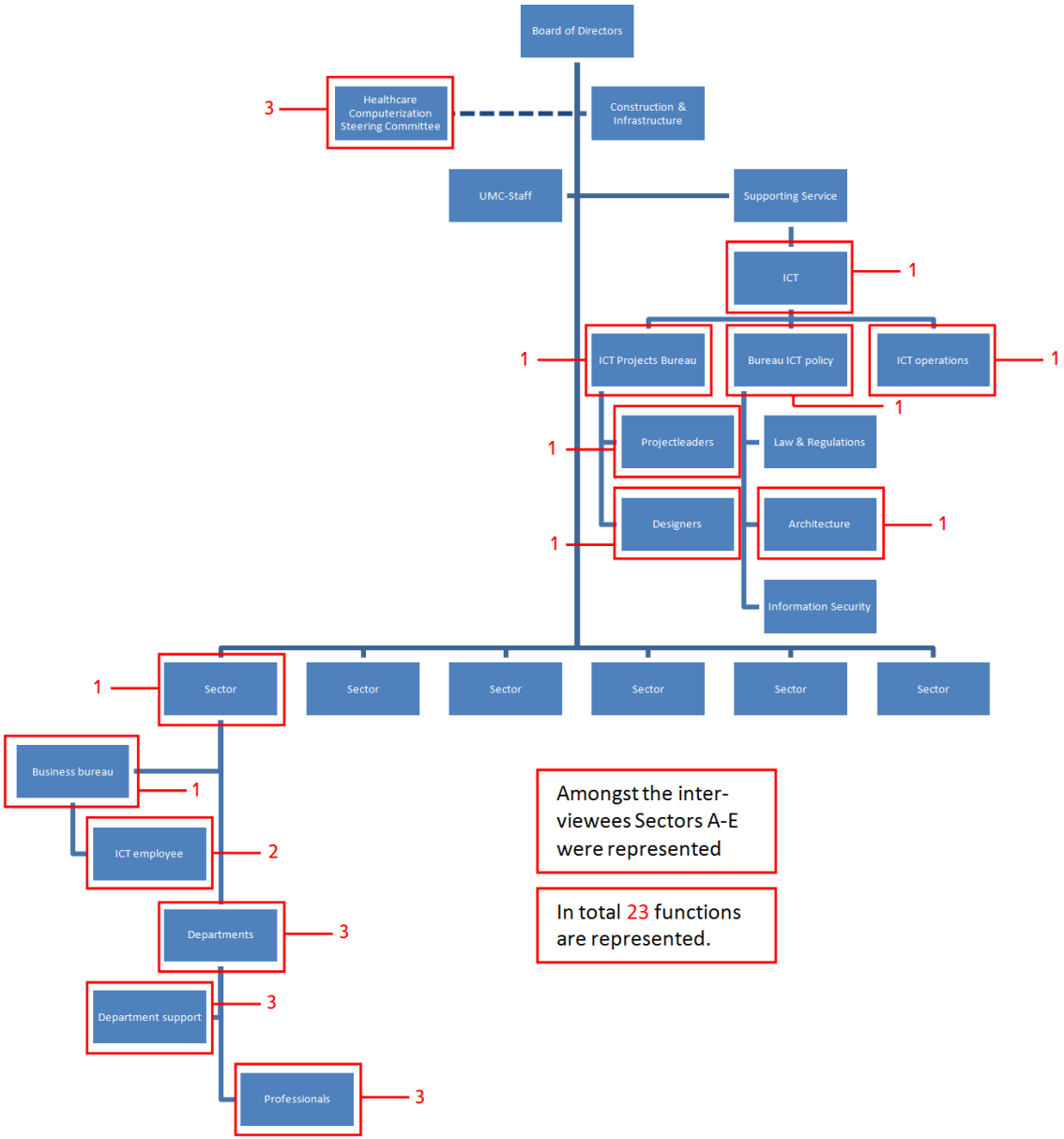
APPENDIX I: ORGANIZATIONAL STRUCTURE



Note: this chart has been derived from the thesis: '*The paradox of autonomy: part of the culture investigation at the UMCG*', by M. van Leeuwen.

APPENDIX II: INTERVIEWEES IN THE ORGANIZATION



APPENDIX III: INTERVIEW PROTOCOL

1. Demographics

1.1. What is your position and role in the organization?
1.2. What is your educational background?
1.3. What kind of experience do you have within and outside the UMCG?

2. Organizational culture

The degree to which the organizations environment is one of collaboration and cooperation.

2.1. What stories are being told in the organization?
PROMPT: Positive or negative? Stories of failure and defeat or mastery and success?
2.2. Are there differences in culture between organizational departments and IT departments?
PROMPT 1: If so, what are these differences?
PROMPT 2: If not, how would you describe the culture in the organization?
2.3. To what degree is collaboration and cooperation the case in the UMCG?

3. Shared knowledge

The degree to which knowledge is shared between business and IT personnel on all organizational levels.

3.1. Are gained knowledge and experiences being shared with other UMCG employees?
PROMPT 1: If so, on what domains does this take place?
PROMPT 2: With whom is it shared?
PROMPT 3: Do others share knowledge and experiences?
3.2. Is communication on that domain strategic and frequent?
PROMPT: How does that show in practice?

4. Prior experience with IT

The degree to which prior experiences with IT projects and change initiatives are perceived as positive and successful by the organizations members.

4.1. What images do you have of previous IT projects?
PROMPT: Would you define those images as positive/ negative/ success/ failures?
4.2. What consequences do these images have for future (change) projects?

5. Leadership approaches

The degree to which executives form a guiding coalition focused on collaboration, that shows rather than tells what the change is about.

5.1. What style of management does your superior use? Or, what style of management do you use?
PROMPT 1: Collaborative versus autocratic and indecisive?
PROMPT 2: Does your superior tell you what to do or does he/her show that himself/herself?
5.2. Is there a clear vision on ICT coming from top-management?

5.3. Do IT managers perceive enough support from top-management?
PROMPT: How does that show in practice?
5.4. Is there a shared vision throughout the UMCG?
PROMPT: If so, how is vision communicated?

6. Planning processes

The degree to which strategic business plans and strategic IT plans exist and are congruent.

6.1. Is there a formalized IT business plan?
PROMPT 1: If so, how is that plan related to the overall organizational strategy?
PROMPT 2: And how are these business plans being translated to day-to-day activities?
6.2. Does top management encourage:
PROMPT 1: Business participation in IT planning?
PROMPT 2: The establishment of an IT plan?
PROMPT 3: IT management's participation in business planning?
6.3. Is there an IT governance program?
PROMPT 1: To which degree is the authority for making IT decisions defined and shared among management?
PROMPT 2: Who sets IT priorities and allocates resources?

7. Communication

The degree to which information exchange between business and IT departments is frequent, and: the degree to which communication styles used are appropriate.

7.1. How is communication between business and IT executives constructed?
7.2. How frequent does this communication take place?
7.3. Is the style of communication used appropriate to the goal it is supposed to serve?

8. Change readiness

The degree to which organizational members are willing to accept, embrace and adopt IT initiatives.

8.1. Next to ICT related projects, what are your previous change experiences within the organization?
8.2. Do you feel there is a need for change in this organization?
PROMPT 1: If so, is there an urgent need for change?
PROMPT 2: If not, why is change not necessary?
8.3. Is there resistance to change?
PROMPT 1: If so, why do you think people resist to change?
PROMPT 2: If not, why is there no or little resistance to change?
8.4. Would you be willing to participate in a change initiative?
PROMPT: Are others in the organization willing to participate in change initiatives, in your perception?
8.5. What steps are taken to 'set the stage' for acceptance?

APPENDIX V: CODING SCHEMA

Code name	Definition	Related Rules (If then)	Examples	Related cites
1. Culture	The degree to which the organizations environment is one of collaboration and cooperation	1) When somebody talks about culture/ cooperation/ collaboration in the organization it is coded as *Culture* 2) When somebody talks about the (in)visibility of the IT staff, communication barriers, history of IT/business relationships, attitudes of organization members to IT, shared domain of knowledge, leadership, or stories that are told within the organization, in the context of organizational culture it is coded as *Culture*	e.g.: Comments such as: "Everybody defends his/her own territory", should be coded as *Culture*	1) Chan & Reich, 2007; Reich & Benbasat, 2000; Nickels & Janz, 2010 2) Earl, 1989; Campbell, 2005
2. Shared knowledge	The degree to which knowledge is shared between business and IT personnel on all organizational levels	1) When somebody talks about shared language, shared domain or shared understanding it is coded as *Shared knowledge* 2) When somebody talks about partnership in the context of a shared domain between business and ICT executives it is coded as *Shared knowledge* 3) When somebody talks about top managers' knowledge of IT, it is coded as *Shared knowledge*	e.g.: Comments such as: "We often do not understand each other, because we know very little of each other", should be coded as *Shared knowledge*	1) Preston & Karahanna (2009) 2) Luftman (2000) 3) Kearns & Sabherwal (2007)
3. Prior experiences with ICT	The degree to which prior experiences with IT projects and change initiatives are perceived as positive and successful by the organizations members	1) When somebody talks about the credibility of the IT team or their track record of previous IT projects it is coded as *Prior experiences with ICT* 2) When somebody talks about the stories about ICT that are being told in the organization it is coded as *Prior experiences with ICT*	e.g.: Comments such as: "ICT projects take too long and do not deliver the desired results", should be coded as *Prior experiences with ICT*	1) Chan, et al (2006) 2) Chan & Reich (2007)
4. Leadership	The degree to which executives form a guiding coalition focused on collaboration, that shows rather than tells what the change is about	1) When somebody talks about leaders or leadership it is coded as *leadership.* Next to that, when somebody talks about characteristics of leadership, e.g.: a focus on the future, creating change, creating a culture based on shared values, establishment of an emotional link with followers or use personal power	e.g.: Comments such as: "I do not know what the UMCG's vision on ICT is", should be coded as *Leadership*	1) Burnes (2009); Kotter (1990) 2) Baker (2004) 3) Chan & Reich (2007) 4) Kotter (1996)

Code name	Definition	Related Rules (If then)	Examples	Related cites
		instead of the power of their position; it is coded as *Leadership* 2) When somebody talks about leadership styles it is coded as *Leadership* 3) When somebody talks about the role of top-management or (the way they show) their commitment to IT it is coded as *Leadership* 4) When somebody talks about communicating vision it is coded as *Leadership*		
5. Planning processes	The degree to which strategic business plans and strategic IT plans exist and are congruent	1) When somebody talks about business plans or ICT plans it is coded as *Planning processes* 2) When somebody talks about governance it is coded as *Planning processes*	e.g.: Comments such as: "We are developing ICT plans in cooperation with users and decision makers", should be coded as *Planning processes*	1) Chan & Reich (2007); Lederer & Mendelow (1998) 2) Luftman (2000); Venkatraman, et al. (1993)
6. Communication	The degree to which information exchange between business and IT departments is frequent	1) When somebody talks about communication between business and IT executives it is coded as *Communication* 2) When somebody talks about the frequency of information exchange it is coded as *Communication* 3) When somebody talks about styles of communication or the amount of information it is coded as *Communication*	e.g.: Comments such as: "I do not often get to speak to actual ICT people", should be coded as *Communication*	1) Reich & Benbasat (2000) 2) Teo & Ang (1999); Sledgianowski & Luftman (2005) 3) Palmer, et al. (2009)
7. Change readiness	The degree to which organizational members are willing to accept, embrace and adopt IT initiatives	1) When somebody talks about willingness to adjust to new initiatives, or about something related to willingness to change it is coded as *Change readiness* 2) When somebody talks about the degree to which someone feels personally responsible for business innovation it is coded as *Change readiness*	e.g.: Comments such as: "I do not think that we will actually benefit from the suggested plans", should be coded as *Change readiness*	1) Holt, et al, (2007) 2) Luftman (2000)

Table 11 Coding Schema