

# The Changing Role of the CIO- Is CIO an IT Expert or a Business Executive?

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## **The Changing Role of the CIO**

### **Is CIO an IT Expert or a Business Executive?**

Information Systems Science

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Abstract  
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## **THE CHANGING ROLE OF THE CIO - IS CIO AN IT EXPERT OR A BUSINESS EXECUTIVE?**

### **PURPOSE OF THE THESIS**

The objective of this thesis is to understand the factors that affect the role of the CIOs in enterprises as well as to examine the role of the CIOs in Finnish enterprises. Moreover, the objective is to understand the role of IT in business strategy planning and execution. Finally, this thesis tries to provide both theoretical and empirical research based suggestions to Finnish enterprises in relation to the research questions of this thesis.

### **METHODOLOGY**

The research is started with a literature review where the emphasis was on such issues as IT governance and the role of CIOs in organizations. The data collection of the empirical part of the study is done with 27 semi-structured interviews involving CIOs, CFOs and CEOs in 19 enterprises. Semi-structured interview questions are augmented with open-ended questions with the aim to deepen analysis on issues covered by the interview questions as well as to better understand responses received.

### **RESULTS**

The main finding of this thesis is that the CIO's role has already evolved into that of a business executive in IT-intensive industries and enterprises. In many other enterprises, the challenge is how to manage the transformation of technically-oriented IT managers into business executives without losing necessary technical competencies.

From the CIO's perspective it is more critical to have access to strategy planning and execution than to have a high organizational status with no such access. The CIO needs not to be a formal member in the executive committee, if the CIO has continuous access to and an active role in the business strategy process and if the needs to organize the executive level responsibilities of IT are understood by the CEO and/or executive committee members. Within this context, the empowerment of CIOs to make strategic decisions will increase the value delivery from the use of IT. Still, one of the easy means to improve the business value delivery of IT is to have the CIO to report to the CEO. This will improve the linkage of business and IT strategies in a natural way. The mentioned impact can be boosted if the CIO is made a member of the executive committee. To carve out more value from the use of IT an enterprise needs to establish a close and interactive relationship between business and IT strategy processes.

### **KEYWORDS**

Chief information officer (CIO), corporate governance, information technology (IT) governance, business and IT alignment, business strategy planning and execution

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## **TIETOHALLINTOJOHTAJAN MUUTTUVA ROOLI – ONKO TIETOHALLINTOJOHTAJA IT EKSPERTTI VAI LIKETOIMINTAJOHTAJA?**

### **TUTKIMUKSEN TAVOITTEET**

Pro gradu- tutkielman tavoitteena on ymmärtää tekijöitä, jotka vaikuttavat tietohallintojohtajan rooliin yrityksissä. Lisäksi päämääränä on selvittää tietohallintojohtajien roolia suomalaisissa yrityksissä. Tämä pro gradu – tutkielma pyrkii myös selvittämään IT:n roolia liiketoimintastrategian suunnittelussa ja toteutuksessa. Viimeisenä tutkielman tavoitteena on tarjota suomalaisille yrityksille teoriaan ja empiriaan perustuvia ehdotuksia tutkielman kysymyksiin liittyen.

### **TUTKIMUKSEN TOTEUTUSTAPA**

Tutkielma alkaa kirjallisuuskatsauksella, jossa painotus on hyvässä tietohallintotavassa ja tietohallintojohtajan roolista yrityksissä. Tutkielman empiirisen osuuden tietojenkeruu perustuu 27 puolistrukturoituun haastatteluun liittäen yhteen tietohallintojohtajien, toimitusjohtajien ja talousjohtajien näkemyksiä 19 yrityksestä. Puolistrukturoitujen kysymysten vastauksia on täydennetty avointen kysymysten vastauksilla, jälkimmäisten tehtävänä on tuottaa aineistoa haastattelukysymysten syvällisempää analyysia varten sekä syventää saatujen vastausten ymmärrettävyyttä.

### **TUTKIMUKSEN TULOKSET**

Tämän pro-gradu tutkielman tärkein löydys oli se, että tietohallintojohtajan rooli on jo kehittynyt kohti liiketoimintajohtajaa IT intensiivisillä toimialoilla ja yrityksissä. Monissa muissa yrityksissä haasteena on se, miten hallita teknisesti orientoituneiden IT johtajien muutosta liiketoimintajohtajiksi ilman, että samalla kuitenkin menetetään tarpeellisia teknisiä kyvykkyyksiä.

Tietohallintojohtajan näkökulmasta on paljon tärkeämpää omata pääsy strategian suunnitteluun ja toteutukseen kuin omata korkea organisatorinen status ilman edellä mainittua pääsyä strategiatyöhön. Tietohallintojohtajan ei tarvitse olla muodollisesti johtoryhmän jäsen, jos hänellä on pysyvä pääsy ja aktiivinen rooli liiketoimintastrategiaprosessiin ja jos toimitusjohtaja ja johtoryhmän jäsenet ovat ymmärtäneet tarpeen organisoida johtoryhmätason IT vastuut. Tässä kontekstissa tietohallintojohtajalle annettu valtuutus tehdä strategisia päätöksiä tai osallistua niihin lisää IT:n liiketoiminnalle tuottamaa arvoa. Kuitenkin yksi helpommista tavoista lisätä IT:n liiketoiminnalle tuottamaa arvoa on organisoida tietohallintojohtaja suoraan raportointisuhteeseen toimitusjohtajan alaisuuteen. Tämä parantaa liiketoimintastrategian ja IT- strategian yhteen linjausta luonnollisella tavalla. Mainittua vaikutusta voidaan edelleen tehostaa, jos tietohallintojohtajasta tehdään johtoryhmän jäsen. Jotta IT:n käytöstä saataisiin enemmän arvoa liiketoiminnalle, yrityksen tulee luoda läheinen, vuorovaikutteinen suhde liiketoiminta- ja IT- strategiaprosessien välille.

### **AVAINSANAT**

Tietohallintojohtaja, hyvä yrityshallintotapa, hyvä tietohallintotapa, liiketoiminnan- ja informaatiotekniikan strateginen linjaus, liiketoimintastrategian suunnittelu ja toteutus

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# 1. INTRODUCTION

## *1.1 The changing world of the CIO*

How could information technology (IT) deliver more value to business has been one of the burning questions of IT management for many years. The significance of this question derives from the increased importance of IT to the performance of societies, organizations, and individuals. In a nutshell, IT is everywhere. On one hand side IT both supports and enables business. Manufacturing, logistics, administrative and other core and support processes run on IT – often under such labels as automation, supply-chain management or business reporting. Access to email, business intelligence information, the Internet and other inter-organizational communication services as well as various IT infrastructure services impact our work in enterprises. The importance of embedded IT has also grown. Products and services include information and IT components. The other side of the coin is that enterprises have become severely vulnerable to IT risks. In addition to the risks of IT service production IT related process re-design, enterprise resource planning and outsourcing initiatives not only change IT supported processes but may lead to large and complicated projects with significant business risks. Furthermore, IT should adapt to organizational changes such as reorganizations, mergers, acquisitions or divestments. Yet IT is often the slowest mover.

There is a considerable amount of empirical evidence which supports the view that IT and its governance impact significantly the performance of enterprises (Weill & Ross, 2004a; Peterson, 2004). According to these findings the ability to apply IT innovatively, to acquire, implement and provide reliable IT services, to manage IT and its risks with measurable performance metrics creates significant value to organizations. Thus the ability to support the achievement of business goals with IT has also become a significant factor for the performance of enterprises.

There is also consistent evidence that changes in business requirements and in the role of IT within business enhance the role of the chief information officers (CIO) in enterprises. Within this context, the CIOs' role has been seen to evolve from that of an IT technology expert to that of a business executive (Gartner 2007; IBM 2007; ITGI 2003). Although



CIOs still need sufficient technological understanding, CIOs are also required to support the alignment of business and IT, and to deliver business value from the use of IT.

This thesis addresses two specific questions which have emerged from the developments described above. First, what is the role of the CIO and who guides the CIO? Should the CIO report to the chief executive officer (CEO), to the chief financial officer (CFO), or somebody else? Does this reporting relationship matter from IT's business value delivery perspective and, if so, in what way? If a person with the CIO title does not carry out the CIO's business executive role – especially focus on the delivery of business value from the use of IT - does that role fall to some other executive(s)? Some observers claim that the relationship between the CIO, the executive committee, the CEO and the board is vital to the success of an enterprise in its use of IT (Rau 2004, Gillies 2005, IBM 2007, Gartner 2006), that is, in achieving value from the use of IT. According to this claim CIOs should be members of executive committees and be present at board meetings similarly to their C-level colleagues.

Secondly, what is the role of IT in business strategy planning and execution and how does that impact the role of the CIO? The need to align business and IT is generally accepted, but what does it mean in practical terms and how does it appear in strategic management practice? Since the scope of business and IT alignment is broad and diverse, this thesis focuses on the relationship of business and IT strategy by applying the strategic alignment model (SAM) proposed by Henderson & Venkatraman (1993, reprinted 1999). Should the IT function and the CIO take business strategy as the starting point for IT strategy and offer limited feedback to business strategy or should IT strategy also actively provide input to business strategy as the SAM model proposes? Does it matter whether this relation between business and IT is unidirectional (IT seen in supportive role with little input to business strategy) or interactive (IT seen in supportive and enabling roles with input to business strategy)? Some observers claim that the ability of IT to both support and to innovatively enable better execution of business strategy is ever more vital to the success of an enterprise and to its use of IT (Peterson 2004, ITGI 2003, Gartner 2007b, Weill and Ross 2004a). According to this claim, the relation between business and IT strategies is dynamic as the SAM model implies and the focus should be on business value delivery from the use of IT.

The increased role and importance of IT for the operations of organizations as well as the growth and changes in the CIOs' task field (Smith & McKeen, 2006) build the bridge between the two questions raised above. The strategic alignment of business and IT as well as the functional integration of organizational and IT structures, processes and competencies most likely impacts the role of the CIOs in organizations.

## ***1.2 Research questions and objectives***

This thesis seeks answers to the above described two generic research questions. The first research question is stated as follows: What is the role of a CIO in an enterprise? From this generic research question following more specific research questions are formulated:

- To whom do CIOs report currently?
- Are there differences in what is expected from CIOs depending on to whom they report?
- What is the organizational status of CIOs, more specifically are CIOs members of executive committees?
- What kind of competencies is required from a CIO for him/her to be or to become a member of an executive committee?
- How has the task of the CIO changed over time? Is it likely that the status of CIOs will change in the future (decrease or increase in importance)?

The second research question is stated as follows: What is the relation of business strategy and IT strategy? From the generic research question following more specific research questions are formulated:

- How is IT perceived in an enterprise?
- What is the role of IT in business strategy planning and execution?
- How are the impacts of IT on business measured?

In addition to answering the research questions this thesis have the following objectives:

1. To understand factors which affect to the role of the CIOs in enterprises
2. To examine the role of the CIOs in large Finnish enterprises.
3. To understand the role of IT in business strategy planning and execution.

4. To provide both theoretical and empirical research based suggestions to Finnish enterprises in relation to the research questions of this thesis.

### ***1.3 Key concepts and constraints***

The definitions for the key concepts used in this thesis are as follows:

**Chief information officer, CIO**, is the most senior person who acts as the link between the highest levels of business management (such as board, CEO, C-level executives and the executive committee) and the IT function. CIO's main role is to take responsibility for understanding the information and the processes that are needed to maximize business's long-term sustainable success. (ITGI 2005)

**Corporate governance** is a set of responsibilities and practices exercised by the board and executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that the enterprise's resources are used responsibly. (ITGI 2003)

**Information technology, IT, governance** is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives. IT governance ensures that IT goals are met and IT risks are mitigated such that IT delivers value and sustains and grows the enterprise. IT governance drives alignment of IT with business and measures performance. (ITGI 2003)

**Business and IT alignment**, is about alignment of IT with business and the resulting collaborative solutions. The key question is whether or not IT investments are in line with the overall strategic objectives of an organization and thus able to create business value. (ITGI 2003)

**Business strategy planning and execution**, business strategy is formulated to some extent at all levels of business within an organization. The overall strategic direction is set

by the board and the CEO, yet the implementation of the strategy involves other senior business management. (ITGI 2003)

A few of constraints of the thesis need to be mentioned. There exist various alternative definitions for the key concepts listed above. In this thesis, IT governance and other key concepts are used as the IT Governance Institute (ITGI) has defined them since those definitions are useful for (IT governance) literature review, provide a consistent set of concepts, and are useful for solving my research questions. This means, that the IT governance concept is thought to consist of the structures, processes and relationship mechanisms in line with the definition of the IT Governance Institute for IT governance. A similar selected constraint is that business and IT alignment is examined from the perspective of the Strategic Alignment Model proposed by Henderson & Venkatraman (1999). Thirdly, the empirical part of the research is conducted through executive interviews; therefore and due to the limited number of interviews (n=27) the results are analyzed qualitatively and no quantitative statistical tests have been used in this thesis. Finally, the interviews did not concentrate on any specific industry and were carried out only in Finland. The focus of the interviews was on Finnish top 40-100 enterprises.

#### ***1.4 Methodology***

The research was started with a literature review where the emphasis was on such issues as IT governance and the role of CIOs in organizations. The concept of IT governance and the challenges that IT governance leverages on IT management is a fairly new topic which offered a meaningful starting point to conduct this research and to understand issues relevant for solving the research questions. The literature review provides an overview over the topics and findings of relevant studies in this field of research.

The data collection of the empirical part of the study was done with semi-structured interviews which involved CIOs, CFOs and CEOs in 19 enterprises. The empirical data was collected with interviews since this data collection method was considered to provide an excellent way to analyze the underlying reasons behind different perspectives over the role of the CIO and in the role of IT in business strategy planning and execution.

Cumulatively 27 structured interviews were organized with CIOs, CFOs and CEOs. The interviews took place in Finland during November 2007 and February 2008. Semi-structured interview questions were augmented with open-ended questions with the aim to deepen analysis on issues covered by the interview questions as well as to better understand responses received. The respondents were contacted through e-mail and phone to set up times for interviews. Each interview was conducted in a face-to-face meeting which lasted from 30 to 90 minutes. Interviews were transcribed to word document and thereafter raw data was analyzed qualitatively.

During the survey, to provoke discussions with the respondents, each interview was started with the following proposition derived from literature: The CIO of an enterprise – the person with responsibility for IT and the business value delivery of IT - should be a member of the executive committee in the enterprise and should hence report to the CEO of the enterprise. With this proposition I examined whether the interviewed CIOs, CFOs and CEOs of large Finnish enterprises share this prevailing view presented in contemporary IT management and IT governance literature, why or why not the interviewees do so, and what issues CIOs address or are perceived to address, both technical and business, depending on to whom they report.

### ***1.5 Structure of the thesis***

I have conducted this thesis and the survey under the guidance of senior consultant Jarmo Nykänen from Ernst & Young Finland Oy and my supervisor visiting professor Tomi Dahlberg from Helsinki School of Economics. Jarmo Nykänen helped me with the arrangements of the interviews and was also present in most of the interviews. Key findings of this research have already been published in a report by Ernst & Young co-written by Tomi Dahlberg, Jarmo Nykänen and myself (Ernst & Young 2008). This thesis extends the findings of that report and provides an overview over relevant literature largely omitted from that report.

This thesis is organized into five chapters. The introductory chapter has aimed to demonstrate the importance of my thesis' topic, especially why it is valuable to explore ways for IT to improve enterprise performance. This chapter presented also the two

research questions, the key concepts and restrictions of the thesis, as well as gave an overview over the methodology used. Chapter two covers the literature review and summarizes opinions and research findings presented in relevant literature. Chapter three discusses the selected survey methodology in more detail as well as describes the characteristics of the empirical data collected. Chapter four presents the main findings derived from the interviews. Finally, chapter five returns to the research questions of this thesis and discusses the findings with their implications.

## **2. LITERATURE REVIEW**

This literature review divides itself into two topics which both impact the role of the CIO and how IT is related to business strategy planning and execution. The first topic discusses the growing role of IT in organizations and for the operations of organizations. Nowadays, traditional and embedded IT supports entire businesses and the processes of value creation. Therefore it should be expected that the changing role of IT impacts also the status of the CIOs and that IT is closely connected to business strategy. The second topic addresses specifically the concepts of corporate and IT governance. I especially review business and IT alignment literature and frameworks related to this alignment. Business and IT alignment frameworks offer theoretical motivation for the changing role of the CIO and for the relation of business and IT strategies. The literature review then moves on to the changes in the CIO's task field and to the increasing requirements placed on CIOs. The literature review ends with the presentation of the theoretical frameworks used to synthesize literature in order to guide empirical research.

### ***2.1 The changing role of IT***

Today, goods and services include embedded IT components. The wide spectrum of different IT infrastructure and other IT services impact greatly to the effectiveness and efficiency of the processes carried out in enterprises. Competencies to apply IT innovatively are above all capabilities to support the achievement of business goals and strategy execution with the use of IT and information resources. According to Mahoney (2007a) strategic decisions which shape the direction and success of the enterprise as a whole require people who understand both business and technology. Mahoney claims that this is due to the fact that the frontier of IT is moving from enabling existing business processes to creating new business and technology processes. Moreover, the role of IT in organizations is moving from a technology focus to a focus on business processes and relationships. All these developments are potential indications about the increasing role of IT for organizations' strategy planning and execution.

I have summarized the results of the literature review on the changing role of IT under the following three topics: The growth in the importance of IT for business strategy planning and execution, IT investment paradox, which has greatly puzzled economists especially during the 1990s, and IT as a resource in business and as an engine for economic growth.

### **2.1.1 The growth in the importance of IT**

Authors cited below claim that leading organizations have understood the opportunities IT offers to business value delivery. According to Peterson IT governance has become a fundamental business imperative since it is the key to realizing IT business value (Peterson, 2004 see also ITGI 2003). The value of IT lies in its ability to improve business performance (Gartner 2007b). Weill and Ross (2004a) present research findings which indicate that companies with effective IT governance have profits that are 20% higher than in other companies pursuing similar strategies. They also give an explanation for this; IT governance specifies accountabilities for IT-related business outcomes and helps companies to align their IT investments with their business priorities.

Some authors see that significant changes will materialize in the priorities and the role of IT organizations in the near future fueled by the changes in IT and its impact on business. Mahoney (2007b) believes that by 2010 the IT landscape will have changed greatly as it has moved from a technology focus to business outcomes and brokered solutions. He suggests that five major dimensions of IT organization describe the transition between 2006 and 2010. Firstly, the *focus of the IT organization* will shift more towards managing sourcing and the delivery of IT services or towards creating and taking advantage of a framework of business processes and relationships. Secondly, the *source of IT infrastructure* will alter, since IT will increasingly manage infrastructure sourcing. Thirdly, *IT organization competencies* are needed more since IT will be expected to build capabilities in the areas of business processes, sourcing and relationships. Fourth, *complexity reduction* is a part of the transition with the aim to improve business flexibility and efficiency. Mahoney finally suggests that IT will be needed to improve *partnership sourcing* to take advantage of outsourcing outcomes and incentives defined in business terms. The implication for the role of the CIOs is that their task field will change



accordingly and the implication for the role of IT in business strategy is a generic increase in importance with a focus on IT supporting the value creation for the entire organization.

Smith & McKeen (2006) interviewed several leading CIOs in the US and suggest several changes to the role of IT, IT function and hence the work of CIOs between 2005 and 2010. They suggest that the role of the IT function will change towards increased strategy collaboration with business. That is, IT is predicted to collaborate more with business to formulate business strategy. The management style of IT is suggested to change towards the creation of appropriate enterprise, process, and information frameworks which increase higher flexibility. A significant change is also predicted to happen in IT function's self-image since IT function is seen to become an enterprise leader in business transformation and innovation. Correspondingly IT staffing priorities are seen to emphasize leadership competencies with combined IT and business skills. IT managers are seen to coordinate complex IT enabled business initiatives, which involve various different organizational stakeholders.

To summarize, several authors propose that the business role of IT will continue to increase. Thus the role of the CIO can be reasoned to evolve more towards a business executive role for since CIOs need to be able to answer to the increasing business requirements towards the IT function.

### **2.1.2 IT investment paradox**

The productivity paradox or in other words the IT investment paradox was much debated among economist especially during the 1990s. Academic researchers were puzzled with the question, why did the increase of economic productivity appear to slow down with increasing investments in IT. On enterprise level, CEOs and business executives have experienced many failures and disappointments with IT. When they have expected strategic value and financial returns from IT investments, they have faced project cancellations and cost over-runs, business disruptions, continuously rising IT costs, decreasing shareholder value and other similar disappointments.

Assessing the value of IT investments has confused managers and academics for several years (Thatcher & Pingry 2007). Studies in the 1980s found no connection between IT investments and productivity from the national economy statistics of the US. Thus this phenomenon became named as the productivity paradox. Although the productivity paradox still exists (Lin & Shao 2006) studies have showed after a couple of decade's debate, that the impact of IT investment on labor productivity and economic growth is significant and positive. (Dedrick et al. 2003).

On enterprise level, dramatic differences have been detected on how enterprises are able to receive positive returns from the use IT. In previous chapter I already referred to the 20% differences in the financial performance detected in the study of Weill and Ross (2004) which involved 256 enterprises. Based on the findings of another study Weill & Aral (2006) introduced the concept of IT savvy to describe the differences between enterprises in their ability to get value out of IT investments. Weill and Aral showed that for every IT dollar invested IT savvy companies are able to plan and execute a set of interlocking business practices and competencies that collectively derive superior value from IT investments time after time. Thus, high-IT-savvy companies turn IT investments into value much faster than do low-IT-savvy-companies and they also learn from their success which means that they further reinforce their IT savvy behavior. Weill et al. (2003) point out that strategic agility, the set of business initiatives an enterprise can readily implement at one point of time, is enhanced by investments into IT infrastructure. Successful enterprises get the infrastructure balance right since they make regular, systematic IT investments on the basis of their overall strategic direction.

In summary, as Spithoven (2003) suggests economic growth and productivity increase with investments into IT. On national economy level IT investments increase the economic growth and on organization level IT can be seen as one of the key enablers for organization's value creation and productivity increases. Yet, enterprises which receive highest returns from IT investment do not just invest into IT, but they have developed business-IT practices and processes by which they gain superior value from IT.

### 2.1.3 IT as the resource in business and engine in economic growth

IT is seen as a strategic resource in business value creation and consequently as an engine in economic growth. Kaplan & Norton (2004) propose that an organization's strategy describes how it aims to create value for its shareholders, customers, employees and other stakeholders. They also argue strongly for the importance of mobilization and alignment of intangible assets. Intangible assets drive long-term value creation.

In order to build a measurement system that captures the value creation potential of strategy, a general model for strategy is needed. Kaplan & Norton present the Balanced Scorecard framework as such model. Their four-perspective Balanced Scorecard model is aimed at describing an organization's value-creation strategy and to provide a language that executive teams can use to discuss the direction and priorities of their enterprises. The measures of the model are viewed not only as performance indicators but also as series of cause-and-effect linkages between the objectives in the four Balanced Scorecard perspectives. Kaplan & Norton call these linkages strategy map. Strategy map is a visual representation of the cause-and-effect linkages between the components of an organization's strategy.

The Kaplan & Norton strategy map model shown in Figure 1 has evolved from the four perspectives of the Balanced Scorecard, which are:

- *Financial Perspective*; how an organizations intends to create sustainable growth in shareholder value
- *Customer Perspective*; the value proposition for targeted customer segments
- *Internal Perspective*; create and deliver value to the customer value proposition
- *Learning and Growth Perspective*; how the people, technology, and organization climate are combined to support the strategy

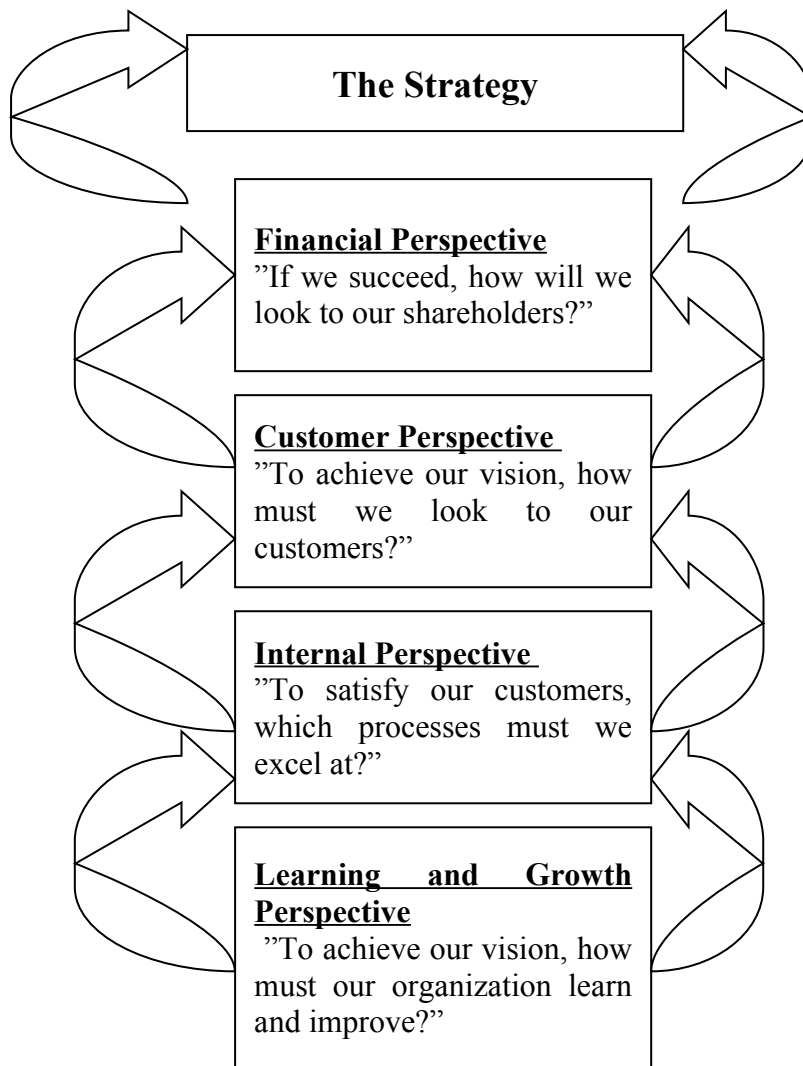


Figure 1. Balanced scorecard strategy map - a simplified model of value creation modified from Kaplan & Norton (2004)

The strategy map model provides an uniform and consistent way to describe an enterprise's strategy so that objectives with related measures can be established and managed. Kaplan & Norton also argue that the strategy map provides the missing link between strategy formulation and strategy execution. From the perspective of this thesis it is important that they stress the significant role of information capital in strategy planning and execution. As one of the key resources of enterprises information capital can be seen everywhere and is thus an important component in business value creation.

Pohjola (2002) has examined the so called new economy from the perspectives of how improvements in productivity and how economic growth is created. He points out that while the use of IT - or information and communication technology (ICT) - has had a

positive impact on the economy of United States, the evidence in the case of other countries is weaker. He offers the following three explanations for this:

1. Only a few countries have invested as much into IT as the US
2. Even if other countries have invested in IT, they have invested less into complementary infrastructure i.e. education and skills which are necessary to reap the benefits from IT investments.
3. The benefits may not lie in the supply side of the economy but in the demand side

Pohjola (2002) proposes that the globalization of business activities and IT revolution will impact economic growth in the foreseeable future. He also claims that many countries have already benefited from the “new economy” as producers of IT goods and services. Not all countries in the world are able to become significant producers of ICT, but they can all become its sophisticated users. The benefits received from ICT use are likely to exceed the benefits from production in the long run. According to Pohjola (2002) the sources of competitive advantage in the global new economy lie in the adoption of technological, organizational and managerial innovations that enhance productivity.

In summary, there has been a lot of discussion on whether or not IT investments enhance economic growth. Kaplan & Norton emphasize the importance of information capital for value creation in enterprises. Pohjola (2002) stresses the importance of IT investments both on enterprise and on economy levels but he also emphasizes the importance of investments into complementary infrastructure. Investments into complementary education and skills will further accelerate economic growth. One may conclude that if IT is seen as a strategic resource in business value creation and as an engine in economic growth it should also have a significant role for business strategy planning and execution and that the role of the CIO should reflect this. Balanced scorecard is one of approaches that can be used to measure the value creation of IT. The measurement of IT impact is important since there appears to be significant differences between enterprises in their abilities to benefit from the use of IT.

## ***2.2 IT Governance***

Enterprises respond to the continuous increase of IT expenditure and IT dependence with efforts to increase the manageability of IT and to carve out more business value from the use of IT. The emergence of IT governance can be seen from this perspective. A natural consequence is that IT governance has been defined in many ways. As explained in chapter 1, this thesis follows the definition provided by the IT Governance Institute (ITGI). Thus the literature review also starts from corporate governance, since ITGI considers it the cornerstone of IT governance. Corporate governance sets the organizational roles and procedures to IT so that IT is able to support and sustain business strategy and goals. IT governance frameworks are then reviewed from the perspective whether or not they provide theoretical backing for CIOs membership in executive committees and from the perspective how IT is seen to be involved in business strategy planning and execution.

### **2.2.1 Corporate Governance**

What is corporate governance and how does it set the organizational roles and procedures to IT governance? Corporate governance is about owners' guidance and board work (Hirvonen et al. 2003). It is also a process which offers information to an organization about the rights and desires of the organization's interest groups (Demb & Neubauer in Hirvonen et al. 2003, p.22). Corporate governance is seen to play a major role in today's business since good corporate governance practices are claimed to have a significant impact on the success of an organization (Hirvonen et al. 2003).

Corporate governance grew rapidly into a widely discussed topic in the wake of financial reporting scandals such as Enron and Worldcom. The need to protect shareholders and other stakeholders with reliable transparent financial information and corporate governance practices became crucial. Good corporate governance is important to professional investors (Weill & Ross 2004b, p.4). According to OECD's report (2004) corporate governance is a key element in improving economic efficiency and growth as well as in increasing investor confidence. OECD defines corporate governance as

*“providing a structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined. Good corporate governance involves a set of relationships between a company’s management, its board, its shareholders and other stakeholders.”* Additionally, good corporate governance creates proper incentives to the board and management to meet the objectives that are in the interest of the company and its shareholders as well provides proper monitoring of target achievement.

OECD (2004) proposes the following principles for the corporate governance framework.

- The framework should promote transparent and efficient markets, be consistent with the rule of law, as well as clearly determine the division of responsibilities in different entities
- Should protect and facilitate the exercise of shareholders’ rights
- Should ensure the equitable treatment of all shareholders
- Should ensure the rights of stakeholders established by law or mutual agreements and encourage co-operation between stakeholders and corporations
- Should ensure that timely and material disclosure is made on all material matters regarding corporation
- Should ensure the strategic guidance of the company, the effective monitoring of management by the board and the board’s responsibility to the company and its shareholders.

In summary, corporate governance sets the organizational roles and procedures to IT governance by capturing and ensuring the strategic guidance of an enterprise, which guide IT operations as well and create the basis for the alignment and integration of business and IT goals, structures and processes. The similarities between ITGI’s definition of IT governance (defined on page 7 and in more detail below in chapter 2.2.2) and OECD’s definition of corporate governance are striking - IT governance extends corporate governance to IT. Finally an increasing number of corporate governance issues cannot be solved without taking into consideration the supporting and enabling role of IT.

## 2.2.2 IT Governance definitions

Over the past years, a lot of attention has been paid to process reengineering, whereas recently more efforts and resources have been allocated to IT governance as a means to improve the manageability of IT and to increase the business value delivery of IT. As the business criticality of IT grows, changes in IT governance are also needed (Weill & Ross, 2005).

IT governance is a concept which has emerged only during the past 10 years. I provided a brief definition of IT governance in chapter 1, but let's now take a deeper look at the meaning of the concept. According to ITGI (*IT Governance Institute 2003, p.10, 37*), *"Information technology (IT) governance is the responsibility of the board of directors and executive management". It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives. IT governance ensures that IT goals are met and IT risks are mitigated such that IT delivers value and sustains and grows the enterprise. IT governance drives alignment of IT with business and measures performance.*" The concept includes: (i) Organizational and other structures which define IT responsibilities and decision-making rights, (ii) (IT) processes with goal setting, acquisition and delivery of services to meet goals set, performance measurement of goal achievement, and continuous improvement, as well as (iii) relationship mechanisms by which business and IT professionals work together to manage and deliver value to business from the use of IT. Changes in IT governance means, that these structures, processes and relationship mechanisms need re-evaluation at regular intervals or when business priorities change significantly.

Effective IT governance is about the way senior management interacts and communicates with IT leaders to ensure that IT operations and investments enable the achievement of business strategy in an effective and efficient manner (Rau 2004). Weill & Ross (2004b) argue that organizations with effective IT governance have actively designed a set of IT governance mechanisms that encourage behavior consistent with the organization's mission, strategy, values, norms and culture. According to them good IT governance specifies the decision rights and appropriate accountability frameworks that together



encourage desirable behavior in the deployment and use of IT (Gillies, 2005). Weill & Ross (2004a) further describe IT governance as the process by which enterprises align IT actions with their performance goals and assign accountability for those actions and their outcomes. Yet, their research indicates that only 38% of senior managers in an average enterprise know how IT is governed.

It is characteristic to the IT governance approach of Weill & Ross (2004b) that they emphasize the specification of IT decision making rights as an IT accountability framework, that is, they focus on IT governance structures. Although Weill & Ross do not pay similar attention to IT governance processes or cooperation mechanisms they have provided the following list of claims for the importance of IT governance:

- Good IT pays off
- IT is expensive
- IT is pervasive
- New information technologies bombard enterprises with new business opportunities
- IT governance is critical to organizational learning about IT value
- IT value depends on more than good technology
- Senior management has limited bandwidth
- Leading enterprises govern IT differently

Robinson (2005) investigated how IT governance helps to achieve the following three objectives:

- Regulatory and legal compliance
- Operational excellence
- Optimal risk management.

To achieve these three objectives, an IT organization must ensure that business value is created and delivered in a most effective and efficient manner (operational excellence), that risks are identified and controlled (risk management/optimization) and that the IT organization has a structure in place which assures effective oversight (regulatory and legal compliance). Robinson (2005) concluded that when IT governance is effective IT

turns into a highly valued asset, inseparable from the business, and will be regarded as an asset, not as a cost.

In summary, according to the definitions of IT governance reviewed above, IT governance appears as a valuable tool for enterprises in their efforts to meet strategic business objectives as well as in creating value for their business from the use of IT. An evident conclusion is that IT has an important supporting and enabling role in business strategy planning and execution. An important aspect of IT governance is to agree accountability for IT between most senior management (board, CEO, C level executives), business management and IT management. An evident conclusion is that the CIO belongs to senior management with IT and business responsibilities. Let's dig deeper into these conclusions by reviewing IT governance models designed for crafting effective IT governance.

### **2.2.3 IT Governance frameworks**

Rau (2004) examined key roles and relationships in a best-practice IT governance designs including, for instance, the roles and responsibilities of an IT governance council, the CIO and IT customer services. He argues that organizational readiness and stakeholder participation are critical success factors for a new IT governance implementation. The best-practice IT governance design structure as proposed by Rau (2004) is shown in Figure 2. It illustrates the organizational roles and relationships needed for policy setting, control, and monitoring of IT usage. An IT governance council, reporting to the board of directors, is responsible for setting the strategic direction for IT, determining and setting funding levels, approving all major development projects and monitoring their results. Achieving effective IT governance requires careful consideration of IT and non-IT organization design components, definitions for the roles and responsibilities of these design components and their relationships, and strong organizational management practices to implement them. Still, according the Rau the most important IT officer is the individual who heads the IT function, the CIO.

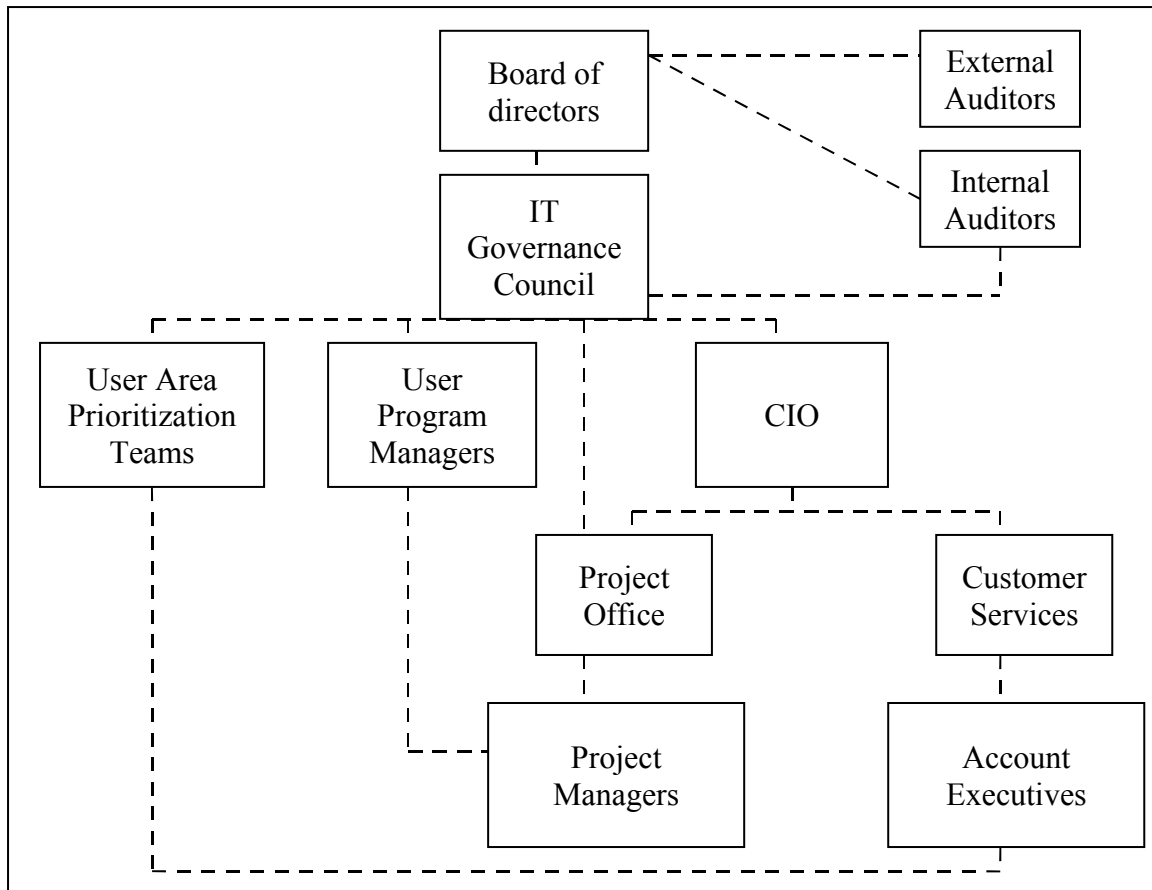


Figure 2. Best Practice IT Organization Governance Design (Rau 2004)

One of the aims of this thesis is to investigate whether or not CIOs should be members of executive committees and report to CEOs. The framework of Rau (2004) underlines the importance of determining IT components, their roles and relationships as well as the role of board of directors in the governance of IT. Rau also underlines the importance of crafting relationships inside of enterprises and states that IT Governance councils should report to boards of directors. According to the model of Figure 2, the most relevant entity to which a CIO should report is the board of directors. This also suggests that the CIO should report to the CEO since the CEO reports to the board.

Gillies (2005) investigated IT governance practices and proposed that good IT governance should be an integral part of corporate governance, driven from the top. Gillies also points out that IT governance practices should recognize the enterprise-wide nature of IT. This means that equal attention should be given to both the demand (business) and supply (IT) sides. He also suggests that the board of directors and executive committee, business and finance executives should all bear their share of IT

governance accountabilities. An interesting observation made by him is that IT governance standards have actually emerged from the work of IT professionals, driven from the bottom. Gillies also estimates that IT governance will continue for some time to be the responsibility of CIOs, which in his opinion suggests that business executives and business still find IT to in the “too hard to understand” basket.

Gillies (2005) proposed a model, shown in Figure 3, on how to arrange IT governance (IT architectures). He divides IT governance into two major categories, operational and strategic. Operational IT governance (architecture) addresses IT operations management, IT risk management and ensures that IT investments are managed responsibly. The target of strategic IT governance (architecture) is to provide confidence that IT strategy is aligned with business strategy and that IT investments deliver value to the enterprise. In his model, IT governance responsibilities are divided between board, business executives and IT executives. The status of the CIO is not defined clearly although the CIO appears to report to the board. This implies that the CIO most likely reports to the CEO.

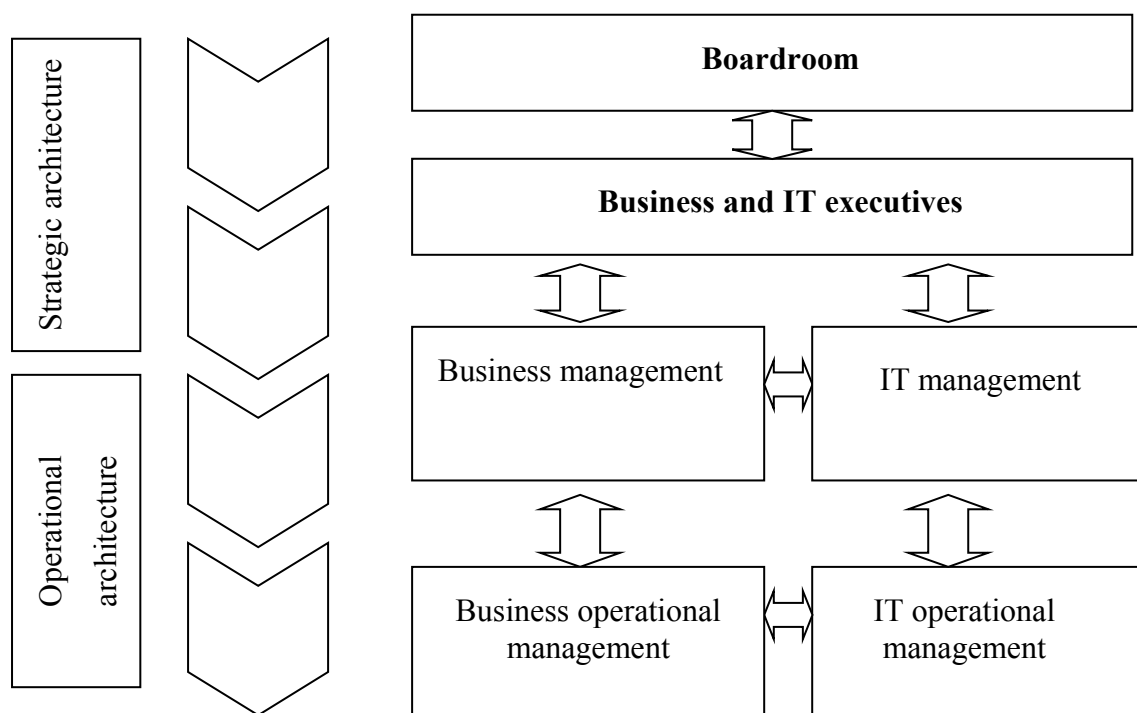


Figure 3. IT governance Responsibility Model (Gillies 2005)

Gillies argues that a good IT governance practice is characterized by its ability to attract equal attention at all levels of IT governance, from both the business and the IT sides of this partnership. In most enterprises, however, business places the CIO and IT under heavy scrutiny regarding roles, accountabilities, costs, estimates and performance, while it is hard to find the similar disciplines and accountabilities from business.

On the basis of literature review, it is evident that IT governance is seen as a compound system which requires great amount of energy from an entire enterprise and that within the enterprise IT governance is not solely CIO's responsibility. Some researchers have investigated how to guide business and IT executives to develop IT governance practices. As an example Peterson (2004) developed IT Governance Assessment Process (ITGAP) model, shown in Figure 4, to help business and IT executives to assess the effectiveness of their enterprise's IT governance (architecture). He presents a holistic model of IT governance in which structural, process, and relational capabilities are an integral part of an effective IT governance architecture. He states that IT governance is a complex system, involving different business and IT stakeholders with specific perceptions, views, goals, and motivations. According to his claims executives recognize that "getting IT right" this time will not be about technology; but about IT governance.

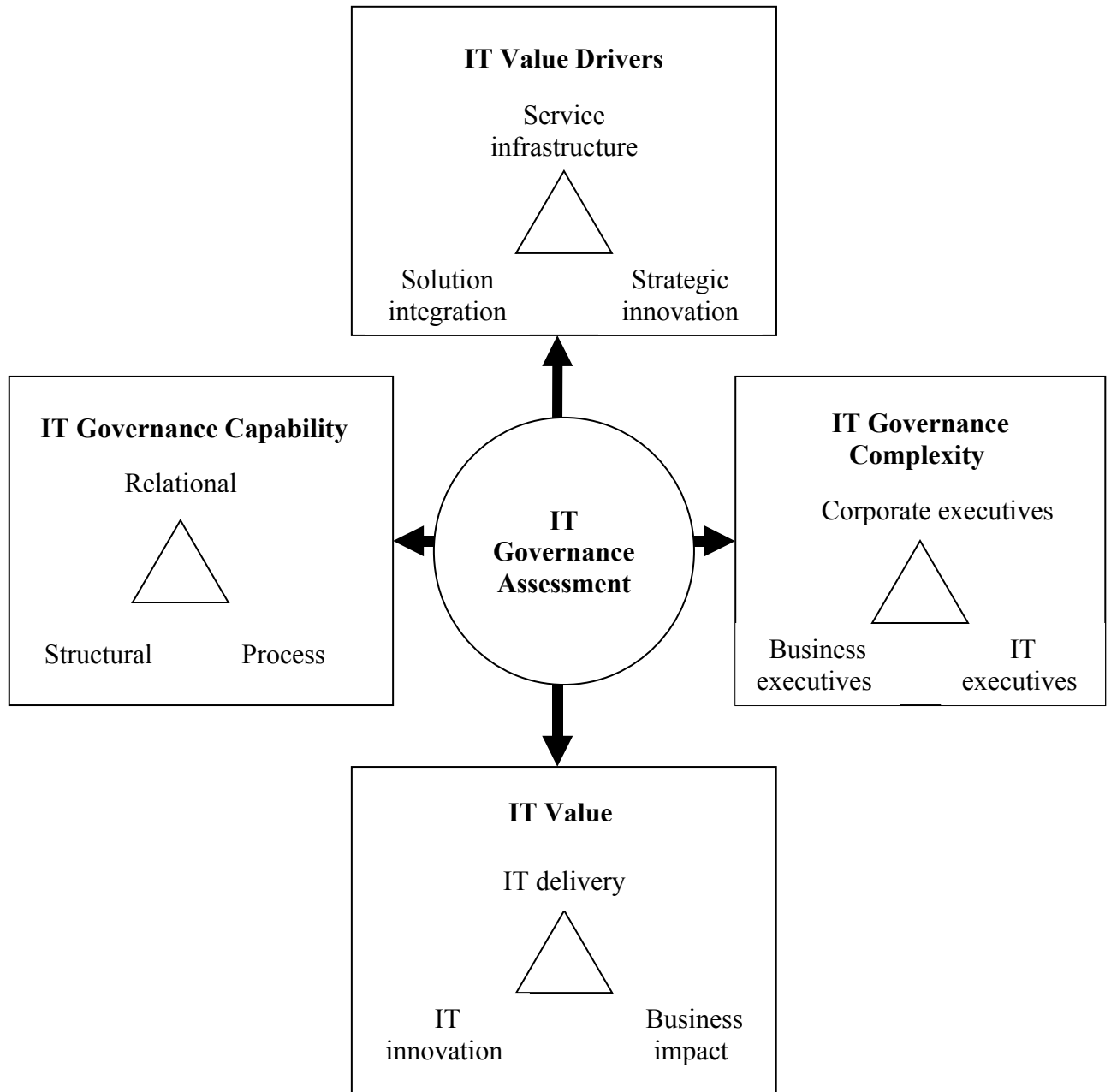


Figure 4. IT Governance Assessment Process model (Peterson 2004)

Peterson’s model consists of two levels - or parts - as he calls them. The first level/part defines the specific profile of an IT governance model in terms of distribution and allocation of IT decision making authority and responsibility. The second level/part describes horizontal integration mechanisms and provides an assessment about the current level of horizontal integration capabilities. Peterson (2004) emphasizes that the emerging paradigm of IT governance is based on collaboration not on control. He claims that in order for IT to be effective, IT governance needs to focus on horizontal integration

capabilities, meaning, the ability to coordinate and integrate formal and informal IT decision making authority across business and IT stakeholder communities.

IT governance is also seen as a complex system which emphasizes the quantity and quality of resources needed to create effective IT governance. Peterson's model clearly stresses the importance of a well-working relationship between business, IT and corporate executives. According to his model coordination and integration are integral parts of IT governance and the mentioned relationship. The model also suggests that IT executives play a major role in the assessment of IT governance maturity. Due to these characteristics it is logical to conclude that the model implies that the IT executive (CIO) should be an executive committee member for an organization to take full advantage of IT, to secure business value from IT and to provide interaction to business strategy.

A promise to increase the ability of enterprises to deliver business value is one the fundamental motivators for the emergence of the IT governance concept. On the basis of their research Weill & Ross (2004b) have proposed that the following ten leadership principles of IT governance will contribute most to the business value delivery from the use of IT:

- Actively design governance
- Know when to redesign
- Involve senior managers
- Make choices
- Clarify the exception-handling process
- Provide the right incentives
- Assign ownership and accountability for IT governance
- Design governance at multiple organizational levels
- Provide transparency and education
- Implement common mechanisms across the six key IT assets (relationship, IP, human, information/IT, physical and financial assets)

The IT governance design framework, shown in Figure 5, is the proposal of Weill & Ross (2004b) on how to implement these guidelines in practice. They claim that effective IT governance articulates and harmonizes six components, which are enterprise strategy and

organization, IT governance arrangements, business performance goals, IT organization and desirable behavior, IT governance mechanisms, and IT metrics and accountabilities.

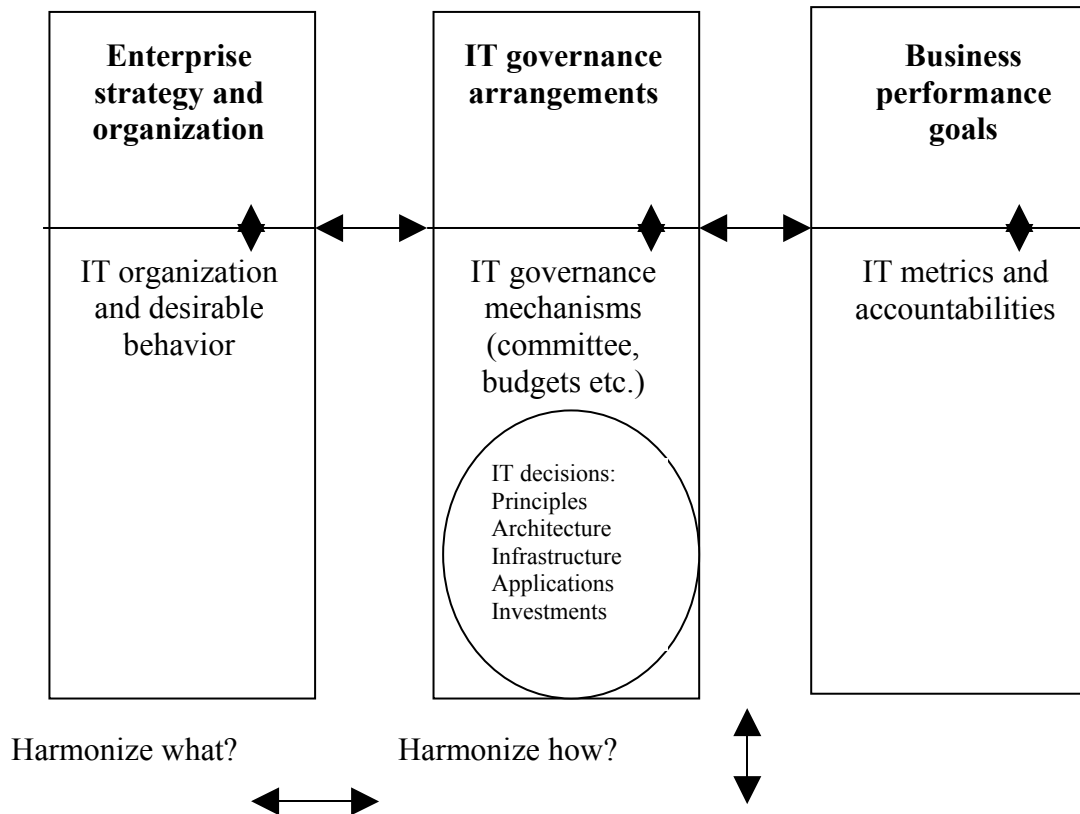


Figure 5. IT governance design framework (Weill & Ross 2004, p.149)

According to the framework of Weill and Ross enterprise strategy and organization defines desirable behaviors and motivates IT organization. Enterprises need to design IT governance arrangements for each of their six key IT assets so that through these arrangements IT both enables and influences business strategy (=harmonize what). Governance arrangements also assign decision making rights for key IT decisions (principles, architecture, infrastructure, applications, and investments). The effectiveness of enterprise strategy and organization combined with IT governance arrangements are reflected both in its stated business performance goals and its ability to meet those performance goals (=harmonize what). The lower part of the framework describes that , enterprises need to harmonize their IT organization and desirable behaviors with enterprise strategy and organization, their IT governance mechanisms with IT governance arrangements, and their IT metrics and accountabilities with business performance goals.



Weill & Ross (2004b) point out that every IT governance decision making arrangement carries risks. Decisions made by IT leaders may face resistance from business managers and vice versa and joint business/IT decision making arrangements may lead to large and cumbersome decision making bodies and inefficiency. Weill and Ross claim that although effective IT governance requires the harmonization of all six components in the IT governance design framework, enterprise strategy and organization still set the direction for the harmonization. As an example, alternative business strategies and organization designs will result in dissimilar IT decision making right designs for key IT decisions. Revenue growth focused strategy is typically accompanied with decentralized IT decision making right arrangements and profitability focused strategy with more centralized arrangements. Weill and Ross also suggest that IT governance arrangements play a major role when the strategic objectives of an enterprise are set. Clearly defined IT governance relationships and roles are important to enterprises due to their impact on business goal achievement. As the importance of business and IT executives' effective co-work increases, executive committees should have a member whose responsibility area is IT and its ability to deliver value to business and business strategy execution.

Weill & Ross (2005) explain the importance of IT governance design by emphasizing that effective IT governance does not happen by accident. When senior managers take necessary time to design, implement, and communicate IT governance processes, enterprises are able to get more value from IT. They also explain that effective IT governance aligns IT investments with overall business priorities, determines who makes key IT decisions and assigns accountability for outcomes.

The framework of Weill & Ross is well known for the model related to and motivated by the framework, called the matrixed approach to IT governance as shown in Figure 6. The matrix specifies five key IT decision making domains. *IT principles* contain the high-level decisions about the strategic role of IT in business. *IT architecture* consists of an integrated set of technical choices which provide guidance to an enterprise in IT technology selections. *IT infrastructure* includes of the centrally coordinated, shared IT services that provide the foundation for the IT capabilities and services of an enterprise. *Business application needs* are the business requirements for purchased or internally developed IT applications. *Prioritization and investment decisions* define how much and

where to invest in IT. All of the key IT decision making domains can be addressed at corporate, business unit or functional level or by some combination(s) of the three.

Weill & Ross (2005) provide six archetypal approaches to IT decision making arrangements. *Business monarchy* is the most centralized arrangement in which a senior business executive or a group of them, sometimes including CIO, makes IT-related decisions for the enterprise in one or more of the key IT decision making domains. The *IT monarchy* arrangement assigns decision making authority to an individual IT executive or a group of IT executives. The *Federal* arrangement assigns this authority to selected or all C-level executives, to business representatives from selected or all operating groups who collaborate with the IT department and to the CIO and other (selected) IT directors. In the *IT duopoly* arrangement decision making involves IT executives and a group of business executives representing operating units or IT executives and C level executives. The *Feudal* arrangement assigns decision making power to business unit heads and/or process leaders who make decisions independently on the basis of business unit and/or process needs. The most decentralized arrangement is called *anarchy* in which each individual user or small groups of users pursue his or her or their own IT agenda. After mapping the decision making rights and archetypes, an enterprise needs to design and implement coordinated set of IT governance mechanisms that managers will use on a daily basis.

IT Governance Archetype	IT Decision Making domain				
	IT Principle	IT Architecture	IT Infrastructure	Business application needs	IT investments
Business Monarchy					
IT Monarchy					
Federal					
IT Duopoly					
Feudal					
Anarchy					

Figure 6. Matrixed approach to IT governance (Weill & Ross 2005)

As indicated by Weill & Ross, it is vital for an enterprise to determine its various IT components/assets and the persons who are in charge for each component. Thus, similarly to the business activity responsibility allocation of the enterprise, it is vital to allocate the responsibilities for at least key IT decisions within the enterprise as well as to determine what kind of competencies the caretaking of various responsibilities require. The matrix of Weill & Ross shows how IT related responsibilities are allocated between executive committee members, business line executives and IT executives and their study suggests that the CIO is one of the C level executives.

One of the means to realize that IT delivers promised value to business is to set business-priority-linked measurable targets and to monitor the achievement of these performance targets. In other words, one of the initiatives to improve the business value delivery from the use of IT – and to solve the IT investment paradox on an enterprise level - has been to develop better IT performance measurement methods and tools. Figure 7 shows the CobiT (Control Objectives for Information and Related Technologies) framework for measuring IT performance and IT governance. The CobiT method developed by IT Governance Institute (2007) is the generally accepted internal control framework for IT. The Balanced Scorecard approach has been one of the most influential intellectual bases for CobiT development.

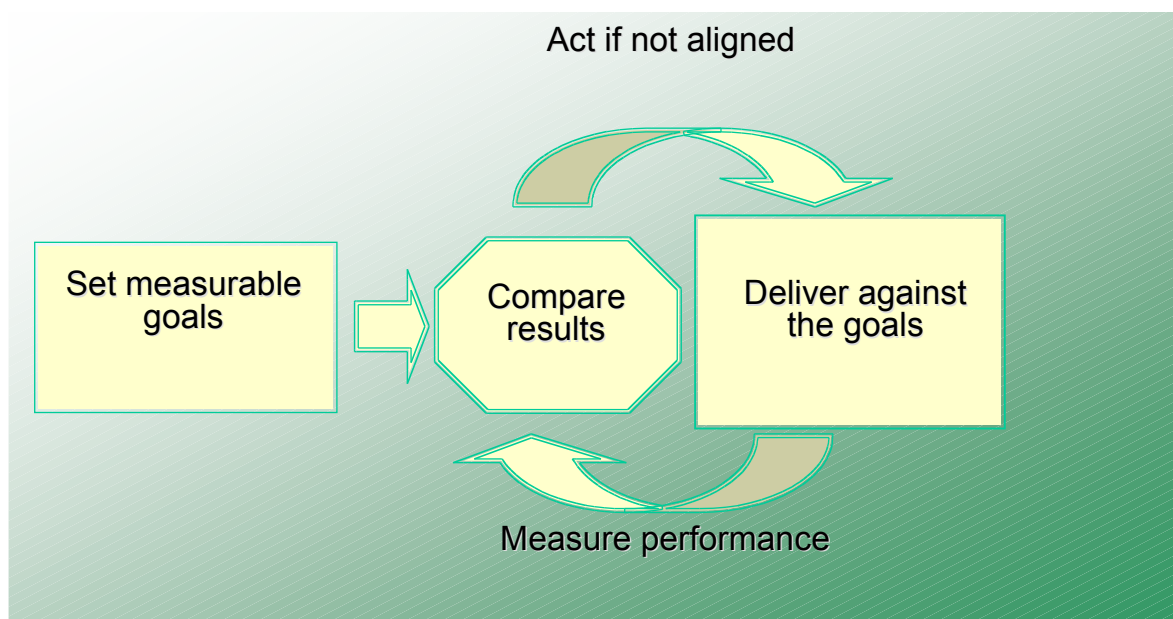


Figure 7: The CobiT framework (IT Governance Institute, 2003)

The CobiT method proposes clear steps on how to align business and IT. The first step is to understand business objectives and the second step is to understand IT objectives. These two sets of objectives – 20 business objectives and 28 IT objectives - are mapped together in the CobiT method. Similarly, the 34 IT processes identified in the CobiT method are mapped to IT objectives. The final step is to define (control) objectives for each IT process. As a result, each (CobiT) IT process has objectives, each IT process is linked to one or more IT objectives, and each IT objective is linked to one or more business objectives.

The idea of the CobiT method is that management should establish an internal control system or framework in order for IT to be successful in the delivery of such IT process outcomes, which satisfy business requirements. The use of the CobiT framework is claimed to provide to enterprises information needed to achieve business objectives since IT resources are claimed to be managed by a set of naturally grouped processes. The framework was created with the focus on being business-focused, process-oriented, controls-based and measurement driven. The CobiT method includes the metrics and a CMM (capability maturity model) type maturity model, which are used to measure the achievement of control objectives, and to identify the associated responsibilities of business and IT process owners. The process model and the domains of the CobiT IT processes are shown in Figure 8.

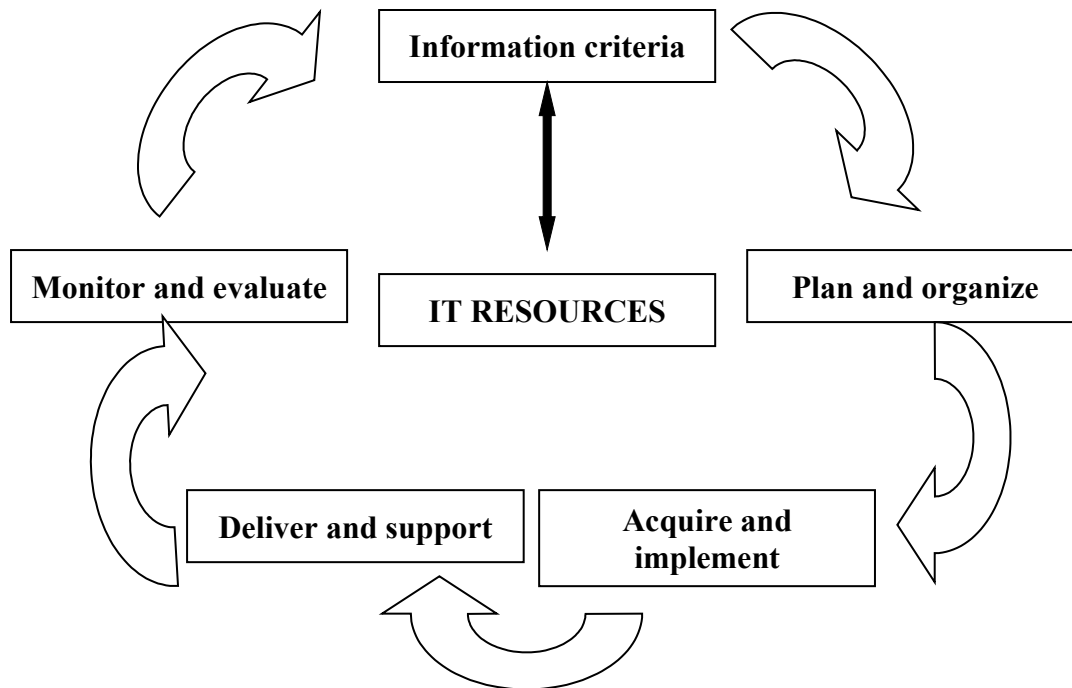


Figure 8. Four interrelated domains of CobiT, adjusted (CobiT 2007)

Dahlberg & Kivijärvi (2006) have proposed an integrated framework for IT governance. Their framework is built on the integration of the structural and processes perspectives of IT governance. According to their framework the IT governance process includes following six IT governance tasks/sub-processes: (1) business-IT alignment, (2) IT operations, risk and management monitoring, (3) IT performance measurement monitoring, (4) continuous development of IT governance. These IT governance planning and execution tasks are seen to lead to and to be accompanied by two evaluation tasks/sub-processes (5) monitoring of business value delivery to current business and (6) monitoring of business value delivery to future business. Theoretically the framework of Dahlberg & Kivijärvi builds on earlier IT governance models and frameworks, especially CobiT (process approach) and the matrixed approach to IT governance (structural approach, Weill & Ross, 2004).

The framework of Dahlberg & Kivijärvi suggests that IT governance should be assessed as a whole and through its parts. The IT governance process starts with business-IT alignment which is the *planning phase*. The alignment of business and IT is impacted by an enterprise's competitive strategy and business objectives, beliefs regarding IT, and by

the enterprise's corporate governance, business practices, organizational and performance measurement culture. The second phase, *execution phase*, includes monitoring of IT resources, IT risks and IT management as well as the monitoring of IT performance measurement. These two first phases are claimed to impact both what business value and what future business opportunities IT delivers. Business value delivery to current business and future opportunities establish the *evaluation phase*. The final phase, called the *IT governance development phase* closes the IT governance process with activities used to improve IT governance supported by feedback and evaluation information.

According to Dahlberg & Kivijärvi and CobiT frameworks IT governance should be seen as a repetitive process, which includes planning, execution, evaluation and improvement. The importance of business and IT alignment is emphasized. This implies that a CIO has an important role to create the linkage between business and IT strategies as well as to business executives.

### ***2.3 Business and IT alignment***

Business-IT alignment has been a challenging puzzle for enterprises for years. Business-IT alignment can be defined as the activities and structures by which an enterprise aligns its business and IT, sets targets for IT, defines principles for organizing IT activities, resource usage, risk management, governance structures and performance measures (Dahlberg & Kivijärvi 2006). According to IT governance institute leadership and commitment is required from the chief executive officer (CEO) and the board to achieve proper business-IT alignment. Although business-IT alignment has been the single most important IT governance issue in executives' minds for many years, we are still no closer to business-IT alignment today than we were 20 years ago. The need for senior business management to become more IT literate is seen inevitable, since such literacy is one of the prerequisites for effective synergizing of business strategy with enabling IT strategies and for ensuring that IT planning becomes embedded into the strategic planning of an enterprise (ITGI 2003, p.7, 10, 13).

From strategic planning perspective business-IT alignment is about the alignment of IT with business strategy priorities and collaborative solutions. The key question is whether

or not – already made, currently implemented or planned - IT investments are in line with the strategic objectives of the enterprise and thus able to create value to business. Alignment is never complete, but an always ongoing process. As indicated by Figure 9, the alignment process activities impact not only the future IT organization and future business organization but also deal with current IT and business operations. IT strategy shows how IT is intended to be used to support the achievement of business requirements. The linkage to business requirements is essential for IT's ability to deliver business value to the enterprise. When IT is considered strategically it can provide enterprises opportunities to *add value to products and services, assist in competitive positioning, contain costs and improve administrative efficiency* as well as *increase managerial effectiveness*. (ITGI 2003, p. 22)

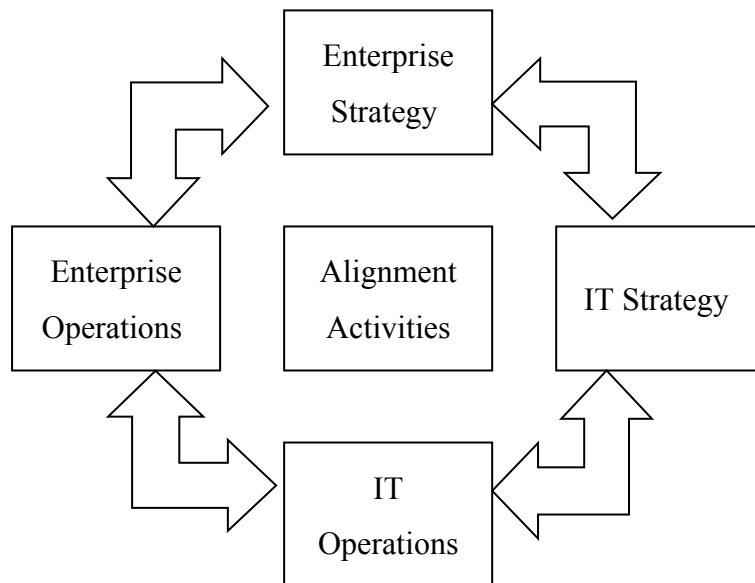


Figure 9. Business-IT alignment activities (ITGI 2003)

Dahlberg et al. (2006) have described six IT business value dimensions impacted by business-IT alignment, IT operations, risk and management monitoring, and IT performance measurement monitoring. Firstly, IT brings *strategic* benefits to an enterprise, for example by strengthening the competitive assets of an enterprise. Secondly, IT provides *financial* benefits through increased profits, decreased costs and more efficient use of capital. Thirdly, IT offers *technical* benefits, for example through technically better managed, more reliable and more flexible IT. Fourthly, IT provides

benefits for the various *interest groups of the enterprise*, for example by providing IT services which allow key interest groups to work more effectively and thus be satisfied with the provided IT services. Fifthly, IT delivers *quality* benefits by enhancing the quality of business processes, for example through more stable and predictable process performance. Finally, IT delivers *risk management* benefits, for example through improved business continuity and by securing that IT risks are within agreed risk limits.

In today's enterprises, nearly all operational issues have an IT implication. CIOs almost literally sit at the intersection of business strategy demands and the deliveries of IT operations. Thus, according to Prahalad (2006) CIOs possess the potential to facilitate the transformation of business strategy into operational excellence if they see and accept their role as the custodians for not just IT but also for business processes that support the execution of business strategy. One conclusion is that CIOs have an important role in the implementation of the linkage between business and IT (strategies) and should therefore be included in the most senior management of an enterprise.

The most important business-IT alignment framework for this thesis is the Strategic Alignment Model (SAM) by Henderson & Venkatraman (1993, 1999), as it is used in subsequent chapters to structure and analyze empirical data. Their framework attempts to conceptualize and direct research on what Henderson & Venkatraman call strategic business-IT alignment. Henderson & Venkatraman argue that inability to realize value from IT investments is in part due to the lack of alignment between business and IT strategies in enterprises. They argue that strategic business-IT alignment is not an event but a process characterized by continuous adaptation and change. Henderson & Venkatraman also claim that no specific IT as such is able to deliver sustained competitive advantage, rather advantage is obtained through the capability of an enterprise to exploit the functionalities offered by IT continuously.

The SAM model, shown in Figure 10, is defined through four domains of strategic choice: business strategy, information technology strategy, organizational infrastructure and processes, and information technology infrastructure and processes. The logic of the model is defined with two alignment dimensions: strategic fit which describes interrelationships between external and internal domains of the SAM model and functional integration which describes the integration between the business and IT



functional domains of the SAM model as shown in Figure 10. For example, IT strategy should be articulated both in terms of an external domain, that is, how the enterprise is positioned in the IT market place and in terms of an internal domain, that is, how the information systems infrastructure should be configured and managed.

According to Henderson & Venkatraman (1999, 1993) the position in the IT marketplace involves three sets of choices; information technology scope, IT systems competencies, and IT governance (which could be understood as IT decision making rights). Similarly, the internal IS domain addresses three components (sets of choices); IS architecture, IS processes, and IS skills. Henderson & Venkatraman claim that inadequate fit between the external and internal domains of IT is a major reason for failures to deliver benefits from IT investments. The other dimension of the Strategic Alignment Model is functional integration which emphasizes the need to integrate IT strategy and business strategy. The model specifies two types of integration: strategic integration and operational integration. The former describes the capability of IT functionality to both shape and support business strategy. Operational integration deals with the integration of organizational infrastructure and process and IS infrastructure and processes.

According to Henderson & Venkatraman the Strategic Alignment Model requires a fundamental shift in the focus of the IT function from an internal orientation towards the recognition of the external IT marketplace defined by the scope of IT technologies, the desired level of IT competencies, and the locus of IT governance. Challenges regarding the future use of IT lay in the selection of appropriate alignment perspectives that best suit to specific business situations and enterprise objectives. The SAM model emphasizes the diversity of roles carried out by both line and IT executives. Several authors have used the SAM model in their research (Van Grembergen et al. in Van Grembergen 2004).

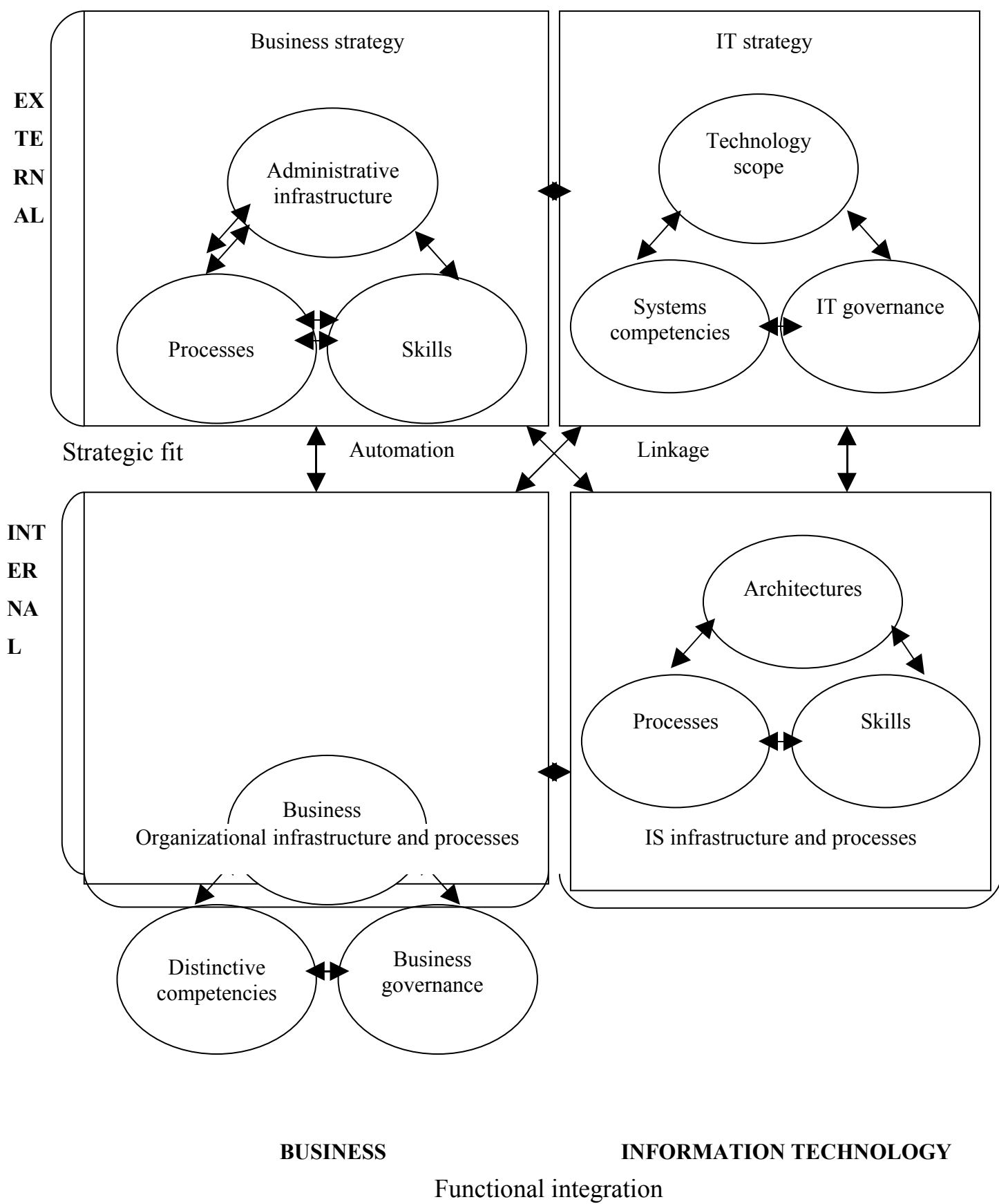


Figure 10. Strategic Alignment Model (Henderson & Venkatraman 1999, 1993)

The importance of business-IT alignment is typically captured in market and other studies which investigate the challenges of IT governance or IT management. For example, PricewaterhouseCoopers (2006) examined the practice of IT governance by interviewing CIOs worldwide. Interviewees were asked among other questions what they understood with IT governance and what issues are related to the implementation of IT governance. The importance of business-IT alignment was clearly established on the study of PricewaterhouseCoopers. Moreover, IT governance was seen by the interviewees as the best means to achieve this alignment. Another finding of the study was that successful IT governance is driven by top management and often includes a strong CIO with support from the executive management. The mentioned study concluded that the drive from the top is the single most critical success factor in the implementation of IT governance.

One of the challenges that IT governance aims to solve is that business benefits of IT are seldom measured, partly as they are hard to quantify. The study of PricewaterhouseCoopers goes further by claiming that it is also critical to measure the costs, desired benefits and performance of IT governance in order to justify the value of sometimes unpopular governance arrangements. According to them only a small number of organizations measure hard benefits or eventual outcomes of governance practices. The mentioned study found that IT governance projects are often integrated with or driven by corporate governance arrangements. This finding is in line with the definition of IT governance presented earlier according to which IT governance is an essential part of corporate governance. The study of PricewaterhouseCoopers also lists the main obstacles of IT governance implementation: culture, resistance to change, lack of appropriate communication, internal politics, resistance to the acceptance of standards/policies, resistance to the acceptance of accountability, and inability to obtain sufficient business involvement into IT governance initiatives (PricewaterhouseCoopers 2006).

The framework of Luftman (2004) is an attempt to provide metrics to measure the performance (=maturity) of IT governance for business-IT alignment. His Strategic Alignment Framework focuses on the activities that management performs to achieve goals across IT and other functions of an enterprise. Luftman proposes that business-

IT alignment addresses not only how IT is in harmony with business but also how business should or could be in harmony with IT. Similarly to Henderson & Venkatraman (1999, 1993) also Luftman (2004) sees that business-IT alignment is evolutionary and dynamic

Luftman's (2004) Strategic Alignment Maturity Assessment Model provides a tool to evaluate the maturity of the following business-IT alignment tasks/criteria:

- Communications Maturity
- Competency/Value Measurement Maturity
- Governance Maturity
- Partnership Maturity
- Scope & Architecture Maturity
- Skills Maturity

Strategic alignment maturity is assessed for each business-IT alignment task/criteria to fall into one of the following five levels of strategic alignment maturity:

- Initial/Ad Hoc Process
- Committed Process
- Established Focused Process
- Improved/Managed Process
- Optimized Process

The levels of the assessment tool follow the CMM (capability maturity model) approach. The idea of the framework is that by assessing the maturity level of strategic choices and alignment practices makes it possible for an enterprise to determine where the enterprise stands today and in what areas it should improve business-IT alignment.

According to Luftman, the most important part of the assessment process is the creation of recommendations which address identified problems (=gaps between maturity level now and desired maturity level in the future) and opportunities to remove identified problems. The most difficult part is to carry out activities based on recommendations. Luftman (2004) emphasizes that to obtain an accurate assessment it

is important that both business and IT executives evaluate each of the six criteria. He also claims that no single activity will enable an enterprise to attain and sustain business-IT alignment.

In summary, the strategic alignment of business and IT is an evolving never-ending process which requires efforts and support both from business and IT executives. The more important IT is to the business of an enterprise the greater role business-IT alignment plays for business value creation and the management of IT operations. The reviewed literature strongly suggests that CIOs have a major role in business-IT alignment which also implies that CIOs should have a strong position within enterprises to be able to execute this task, perhaps as members of executive committees.

## ***2.4 Studies on the changing role of the CIO***

Literature reviewed so far suggests clearly that CIOs should be regarded as members of senior management in enterprises due to CIO's centric role, tasks and competencies in IT governance including business-IT alignment both on strategic and operational levels. Another stream of relevant literature addresses the work of CIOs and changes in it. This literature addresses also the relationship of CIOs and other executives and may reveal what is required from CIOs for them to be a part of senior management.

### **2.4.1 Changing in the task field**

Developments in information and communication technologies, IT services and business requirements continuously change demands placed on IT. Skills, knowledge and methods initially developed to manage the internal corporate IT function are now widely needed within enterprises to manage their ever-increasing use of IT. Due to the growing importance of IT for enterprise operations, many observers claim that the role of CIO has evolved from that of an IT expert to that of a business executive. Although CIOs still need sufficient technological understanding, CIOs should above all offer tools to support the alignment of business and IT, to secure that IT delivers

business value and to manage IT responsibly. The linkage between business and IT needs to work in both directions; business needs to take into consideration possibilities and restrictions imposed by IT and IT strategy needs to support the achievement of business strategy. CIOs literally sit at the challenging intersection of these two strategies.

The task field of the CIOs has evolved from the past when the task field was largely technical. Similarly, the role of the CIO can also be seen changed. The CIO is the most senior link between the highest levels of business management - usually the board, CEO and the executive committee - and the IT function. Thus, for example, the IT Governance Institute (ITGI 2003) argues that business skills are nowadays more important than technical knowledge for a CIO. Correspondingly, CIOs need to be recruited as much if not more based on their business skills rather than technical skills.

A recent IBM study (IBM 2007) describes how the role of the CIO is evolving. The study underlines the importance of CIO's leadership skills both as a business executive and as IT executive. The partnership between the CIO, CEO and other business leaders is seen to shape the destiny of enterprises. The reviewed study also emphasizes how important it is for CEOs and business leaders to recognize the changed strategic role of IT in enterprises as well as the increased strategic role of CIOs in the execution of business. As an example, CIOs are among the key actors in driving business model innovation that goes beyond the traditional understanding of IT. Participation into business model innovations offers CIOs opportunities to accelerate and manage their transition to business executives and partners to business units. The study concludes that it is time for CIOs to lead innovation and profitable growth initiatives by forging more collaborative relationships with CEOs and other business executives.

On more concrete level the IBM study noted that CIOs have a major task in fostering the organizational capability needed to extract more value from IT investments. According to the results of the survey, 84% of participating CIOs believed that information technology will transform their industries significantly. Yet, only 16 % of

the CIOs felt that their enterprise was taking full advantage of IT's transformative potential.

The IBM study also discovered, that all the time more CIOs are finding their ways into enterprises' management teams and executive committees. Still, over one-third of participating CIOs did not have such a formal status.

Mark & Monnoyer (2004) examined, what challenges CIOs face. The main conclusion of their study was that there is a need for new kind of IT leader, who is able to find ways for IT to change enterprise performance. CIOs have so far optimized IT assets successfully, but they have been able to improve enterprise performance in too few cases. CIOs need to redirect their focus from IT supply management (read IT services delivery) to IT demand management, that is, to help business to innovate through its use of IT. CIOs need to adjust their leadership skills correspondingly.

In 2005, Gartner (2005) studied what tools CIOs use to shape and demonstrate their contribution to the enterprise. Gartner's study underlines that CIOs have two dissimilar primary roles; senior IT leader (the operational role) and business executive (called the contribution role by Gartner). Successful CIOs shape their contribution role and measure their progress with such tools/means as improving their personal skills, organizing the IT function for contribution and continuous assessment and alignment of the IT function against the enterprise's strategy drivers. Success in business contribution starts from building the operational excellence of the IT function to gain credibility among peers. The key personal skill needed in the contribution role is the ability to collaborate with executive level persons/peers. Maximizing the quality and the frequency of peer interactions with such simultaneous personal skill improvements that help the CIO to achieve business solutions, increase the success probability of CIOs. (Gartner Group 2005)

In 2007, Gartner Group (2007a) studied what issues needs to be on CIOs' agenda for them to meet business expectations. The main finding of the study was that IT related expectations concentrate on providing new enterprise capabilities. Ability to create future sources of enterprise (profit) leverage is of utmost importance in increasingly demanding markets. Business executives expect IT to bring leverage that makes the

enterprise unique in some way in the eyes of its customers and/or other stakeholders. CIOs' means to create this expected leverage is to focus on resource, technical excellence, agility, and information and/or innovation management. Gartner's study further underlines that business executives expect CIOs and the IT function to take a larger business role. This requires that CIOs lead the IT function in new ways such as moving away from the technology driven leadership tradition.

In summary, studies reviewed indicate that the task field of CIOs is both changing and growing. CIOs' focus is seen to transform from technical know-how towards a more holistic understanding of business and business priorities as well as the ability to combine effectively business strategy and IT strategy. CIOs are key actors in linking the two. Evidently, this transformation changes also the organizational role of CIOs.

#### **2.4.2 The relationship of the CIO and other executives**

As the role of the CIO changes towards business executive and strategist the issue whether or not to include the CIO in the executive committee or in other organizational entities that manage the entire enterprise becomes critical. According to Gillies (2005) issues such as IT governance or IT risk management should be on the agendas of boards, business management and accounting professionals, who should examine IT governance practices in their own organizations and question the role they play. In highly IT-dependent businesses it is beneficial to have the CIO in the main executive committee with access to board of directors to ensure that the CIO participates into all major business relevant discussions and decisions. According to the IT Governance Institute (ITGI 2003) only this ensures that essential IT implications are properly factored in at the earliest stage of any major strategic decision.

If it is – for any reason - inappropriate that the CIO is a full member of the executive committee, IT should at the least be a regular item on the executive committee and/or board agenda so that the CIO participates by delivering reporting agreed and by taking part into the resulting discussion. When the CIO is not a full or ex officio executive committee and/or board member, it is essential that the CIO reports a full executive



committee and/or board member who has a proper appreciation of IT-related issues and who can be trusted to discuss and consult with the CIO all business discussions and decisions for which IT will have implications (ITGI 2003).

A recent study by the *Finnish Information Processing Association* (2007) revealed that 39% of CIOs who participated into the study report to CEOs and 28% to CFOs.. The study also reported that, although 59% of the respondents indicated that IT plays a major role in the business development of their enterprises, only in 30% of the enterprises CIOs were members of executive committees. In enterprises where CIOs reported to CEOs, IT strategy was more closely linked to business development. Similarly, in enterprises where CIOs were members of the executive committees, IT projects met their budgets and deadlines better.

In 2004, Gottschalk (2004) investigated among other issues the role of the IT function, the organizational status of the CIO and the key issues in IT management in Norway and in the US. He discovered that CIOs find the managerial role of entrepreneur the most important. A major responsibility of the CIO is to ensure that technical opportunities are understood, planned, implemented, and strategically exploited in the organization. His study also includes a table which shows how the CIO-CEO reporting relationship has evolved over time in the US and in Norway. Over time the number of CIOs reporting to CEO has increased, especially in the US. In the US 27% of surveyed CIOs reported to CEOs in 1992, whereas that number had increased to 43% in 1997. Contrary to the US, there was a small decline in the number of CIOs reporting to CEOs in Norway during the same period. Another trend in Norway was that the reporting relationship was moving away from CFOs to other C-level executives.

In 2006, Gartner Group (2006) examined how CIOs can increase their effectiveness while working with the board of directors. The study discovered that CIOs with the highest levels of interaction and credibility had changed their role from a technology leader to a business leader. This Gartner study underlined that success is related to CIOs' skills to build board-level acumen, to prepare for each interaction, and to excel in every board meeting. CIOs need to explain IT performance and IT-related issues in ways and with vocabulary that are meaningful to board members and shareholders.

The same skills are useful also in their relationship with the CEO, C-level executives and business unit executives. Such communication cannot be achieved with technical skills only. Rather understanding of business and business priorities in relation to IT performance is essential.

In a recent report, Gartner Group (2008) emphasized that CIOs need to focus on creating exclusive solutions by applying IT in new and unique ways as a response to rising business expectations, including the development of innovative business models. CIOs need to be able to offer new ways to improve the business performance.

On the basis of studies reviewed in this chapter I conclude that there is a fairly clear trend suggesting that the role of the CIO has moved towards that of a business executive. This trend is evident, for example, in a repetitive way in Gartner Group's reports. For example, in 2004, Gartner Group investigated the relationship between CEOs and CIOs and found out that most CEOs viewed their CIOs at that time as effective operational leaders. Yet, a minority of CEOs considered CIOs as business leaders and these CIOs were seen to deliver more value to the business. The report emphasized that the quality of the CEO-CIO relationship impacts significantly CIOs' effectiveness and success as business leaders, but also the value delivered to the business from the use of IT.

I summarize the prevailing views of the market and other studies as follows: the CIO is the most senior link between the IT function and the highest levels of business executives. To deliver value to business it has become more important to have excellent business skills than to have superior technical knowledge although good technical know-how is still needed. Thus, CIOs should be selected as much, or even more, for their business competencies as compared to technical competencies alone. Nowadays the ability to link business strategy/priorities and IT strategy/services is one of the key imperatives for the business success of enterprises. Reviewed literature suggests very clearly that CIOs have a significant role for their enterprises as they are placed in the intersection of these two strategies. Reviewed literature also very clearly supports the claim that the CIO should be included in the executive committee (if appropriate to the situation) as well the importance that the CIO reports straight to the CEO.

## ***2.5 Conclusions of the literature review***

The debate around the IT investment paradox has led to the conclusion that information and IT are important sources of economic growth both on national and enterprise levels. The Balanced Scorecard approach complemented with the Strategy Map concept (Kaplan and Norton, 2004) represents another example of approaches where “information capital” is seen critical to business performance. Kaplan and Norton describe information capital as the technology that facilitates process improvements. They claim that these kinds of intangible assets are, in the long run, key to excellence in tangible outcomes.

Driven by the digitization of information, innovative use of embedded information and IT components in goods and services, and the process improvement potential offered by IT, this technology becomes ever more present. From an innovation management perspective IT enables innovations not only in goods, services and processes but also in business models. As mentioned, IBM (2007) encourages CIOs to drive or to participate in the development of business model innovations that go beyond the traditional understanding of IT. By doing so CIOs will play an important role in innovation and profitability growth initiatives, but will also establish more collaborative relationships with CEOs, other senior executives and business unit leaders. One of the CIO’s typical responsibilities is to ensure that rapidly changing IT opportunities are understood in a business context and that the exploitation of these opportunities is well planned and executed.

CIOs have also an important task in coaching business executives to understand the strategic role and business potential of information resources and in supporting strategic agility. There is a high correlation between strategic agility (the set of business initiatives an enterprise can readily implement) and IT infrastructure capabilities. Supporting strategic agility requires time, money, leadership, and above all understanding of IT infrastructure needs aligned to strategic agility priorities.

In summary, the business value of IT comes largely from its capability to improve business processes, and its ability to facilitate innovations and strategic agility. CIOs need to educate their business peers on how IT can improve business processes, be a source of innovations and support the competitive agility of the enterprise. To become effective business strategists, CIOs should be members of executive committees, or in the dominant coalitions that manage the enterprise, or at the minimum to have constant access to the discussion and decisions of such organizational entities.

## ***2.6 Research frameworks used to structure interviews***

Another summary result of the literature review is the identification and/or creation of suitable research frameworks which are to structure empirical data collection, analysis and reporting. All in all three research frameworks are used to describe the relationship between CEOs, CFOs and CIOs, the issue who bears the responsibility of IT and how business and IT strategies are linked. The frameworks also describe the role of IT within enterprises.

The responsibility for enterprise IT is dependent on multiple factors as the research framework shown in Figure 11 indicates. A generic attitude towards IT in an enterprise impacts significantly how IT responsibilities are allocated (ITGI 2003, Dahlberg & Kivijärvi 2006). The personal competencies of the CIO (and other key executives) as such and in relation to the requirements placed on those competencies impact also the allocation of IT responsibilities. The alignment of business and IT impacts the role of the IT within the enterprise and thus affects also the allocation of IT responsibilities. Organizations perceive differently what possibilities IT offers to the business value creation process. This is also dependent on how organizations measure the impacts of IT.

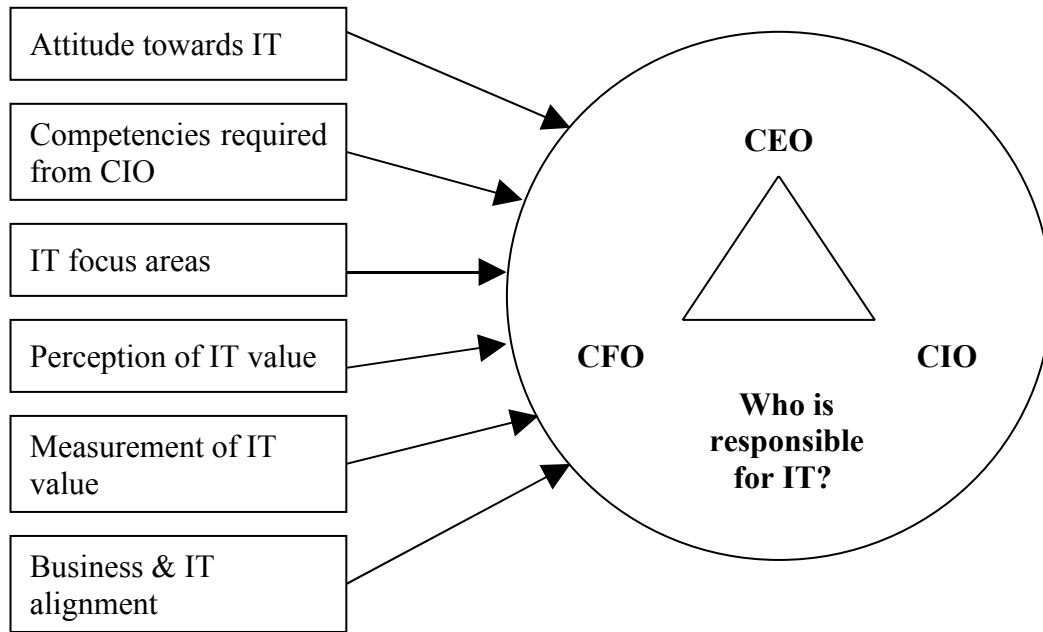


Figure 11. Research framework to describe IT responsibility allocation between CEO, CFO and CIO

The second framework, shown in Figure 12, describes factors that affect the impact of IT to the enterprise as perceived by the enterprise. As a trend the role of IT has become all the time more significant to enterprises during the last decades due to several factors. Those factors are, however, perceived differently by various enterprises and thus the role of IT varies from enterprise to enterprise. The role of the CIO within the enterprise is one such factor which impacts the role of IT, and as the role of the CIO varies also differences in the role of IT are expected to be discovered in the empirical data. Attitude towards IT and IT impact measurement culture are also expected to vary between enterprises.

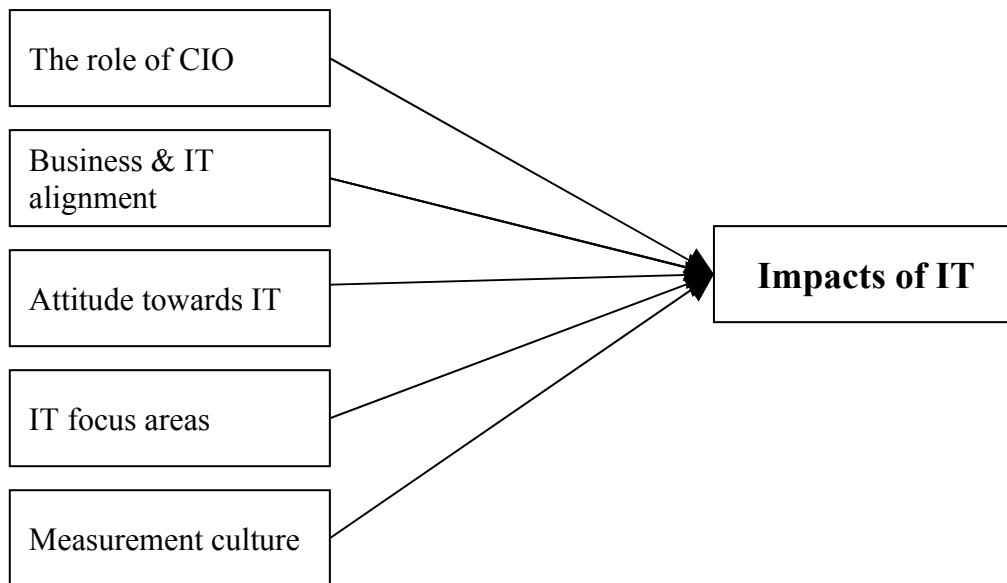


Figure 12. Research framework to describe factors which affect how the impacts of IT are perceived and/or measured

The third framework, shown in Figure 13, defines the linkage between business strategy and IT strategy. The framework is a simplification of the Henderson & Venkatraman (1999, 1993) Strategic Alignment Model (SAM). The framework has been simplified in order to emphasize the connection of business strategy and IT strategy: The simplified strategic alignment model of Figure 13 shows the proposed two-way relation between business strategy and IT strategy. The model also illustrates the proposed two-way relations between (i) business strategy, (ii) IT strategy, (iii) organizational structures, processes and skills, and (iv) IT structures, architecture and processes. This connection will be examined empirically with interviews so that interviewees are asked how they perceive the linkage.

The alignment of business and IT strategies is also influenced by the previous research frameworks shown in Figures 11 and 12. For example, attitudes towards IT and CIO as well as the measurement culture most likely impact the strength of the strategic alignment. However, these more complicated linkages between the frameworks are excluded from this thesis.

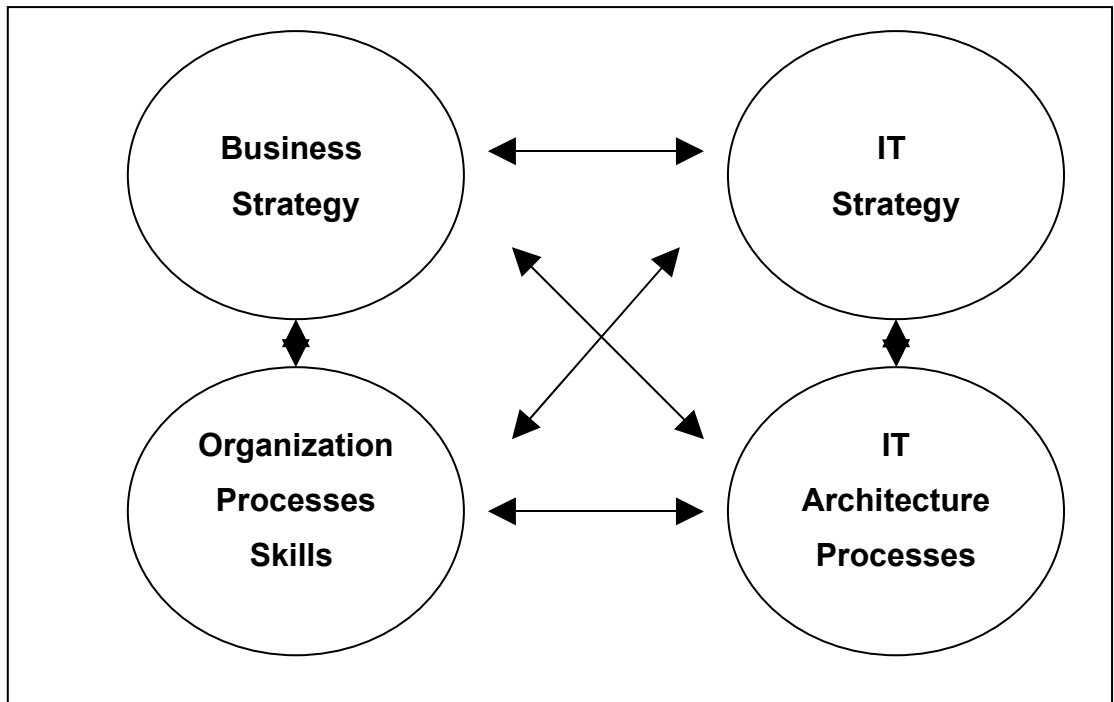


Figure 13. Research framework to describe the alignment of business and IT (strategies) modified from Henderson and Venkatraman (1999, 1993)

### **3. METHODOLOGY**

The empirical part of the thesis is based on semi-structured interviews where CIOs, CFOs and CEOs were interviewed in 19 Finnish enterprises. Interviews took place in Finland during November 2007 and February 2008. There were totally 27 interviewees, mostly CIOs. The interview questions were based on the research questions of this thesis as well as information derived from earlier research conducted in the area of the thesis and condensed to the frameworks shown at the end of Chapter 2.

In order to answer to the research question of this thesis, I conducted the mentioned interviews together with Jarmo Nykänen from Ernst & Young. My supervisor Tomi Dahlberg participated into the formulation of the interview questions in addition to Jarmo and myself. The aim of the interviews was to gain insight on the investigated questions by interviewing executives from different industries and field of expertise. To gather broad view on the topics, we thus interviewed CIOs, CEOs, and CFOs. It is noteworthy, that most interviewees were CIOs and that only a few CFOs and CEOs were interviewed. The actual title of the CIO was often something different, for instance, IT manager/director, ICT manager/director, or administrative manager/director. A reader should understand that in interpreting the results of this thesis one needs to keep in mind that the results reflect mainly interviewed CIOs' perceptions.

The interviewees were recruited from the top 100 Finnish enterprises, measured with annual revenues, especially from the top 40-100 enterprises. The focus was on the top 40-100 enterprises, since on the basis of previous studies and experience of my supervisor it was expected that the CIOs in the largest 40 enterprises are already primarily business executives, even if CIOs would not report to CEOs.

There are several guidelines that have been used in this thesis in order to gain insight how to analyze qualitative data. This thesis is qualitative one since there was not enough data to be analyzed quantitatively. Qualitative research is increasing in use in



a wide range of academic and professional areas (Holliday 2008). Eskola & Suoranta (2005) describes qualitative research as research which is mainly pure text. In other words qualitative research means building theory from the empirical data. In qualitative research statistical probabilities are not suitable for clew (Alasuutari 1999). Eskola & Suoranta (2005) also states that the most common way to gather qualitative data is through interviews. As can be seen from this thesis, interviewing CIOs, CEOs, and CFOs was the best way to investigate the topic. Especially, this thesis is based on semi-structured interviews which means that the same question for the interviewees are given yet there are no different options for answers provided, thus the interviewees can answer to the questions by their own words (Eskola & Santala 2005).

In a qualitative research the basis of the reliability is the author herself and thus the judgment of the reliability concerns the entire research process. Validity is one of the criteria for reliability. The reliability of qualitative research has been criticized. (Eskola & Suoranta 2005) If a method of collecting evidence is reliable, it means that everybody else using this method, or the same person using it at another time, would come up with the same results. Validity refers to the problem of whether the data collected is a true picture of what that is being studied. (McNeill 1990) Although qualitative research has been under criticism, I would claim that this thesis was successful since all the research questions were able to be answered.

### ***3.1 Research findings***

This part of the thesis presents the research findings. The section starts from the role of the CIO. The section continues to the role of IT in the business strategy planning and execution. The interview questions covered also such issues as what is expected from IT and what measurement procedures are used to measure the impact of IT. This section ends with conclusions over the findings.

### **3.1.1 The role of the CIO**

The first part of the interview questions was about the role of the CIO and whether or not the CIO was an executive committee member. Currently in most of the interviewed enterprises, CFOs have the overall responsibility for IT at the executive committee level. The IT function is considered by most enterprises as one of the support functions, that is the role is seen rather traditionally.

In spite of the traditionally perceived role of the IT function, it is also evident that the role of the CIO has and is changing. Based on the interviews CIOs are expected to be more and more business oriented. Deep understanding over the business of the enterprise is becoming more critical for CIOs than pure IT technical skills. IT technical skills are also good to have, although the importance of business know-how is on the increase. In certain situations, (a part of the) IT technical skills can be bought, for example through IT outsourcing. Also in these situations it is important to have sufficient level of IT technical skills in order to be able to manage IT outsourcing successfully. It is acceptable that some technical IT management competencies are possessed by IT experts other than the CIO. This all means that the CIOs' job field has become broader than ever before. This development puts pressures on CIOs to acquire better business, strategic management and human resource leadership skills.

CIOs' backgrounds are also changing. As CIOs' skill requirements are no longer based just on technical know-how, an increasing number of IT directors and managers are recruited from business or business development units. At an extreme, this may lead to situations where the IT function has no traditional technical IT managers only administrative managers who take care of IT matters, especially IT purchases.

Nowadays, CIOs need to possess a large plethora of skills. CIOs need to be more often multiple skilled persons than technical experts in order to survive the pressure from business requirements and units. For instance, CIOs need both operational as well as managerial skills. Many interviewees pointed out that effective interaction and communication with others is critical in CIOs' daily work. The interviewees also

pointed out that CIOs should be able to offer solutions and possibilities for business process reengineering. It is also expected from CIOs that they participate to the building of organizational competencies. Finally, in order to respond to the demands of the (strategy) planning process CIOs need to understand both the business strategy of the enterprise and the special competencies which the enterprise has in its operations.

One of the most interesting discoveries was that IT has a significant role for the executive committees in only a few enterprises. In these enterprises, the CIO's role was broader than the role of a traditional IT manager. Furthermore, these enterprises were either highly dependent on IT, and/or they utilized IT very proactively. Although there is insufficient evidence to make definitive conclusions, there was a strong sentiment that these enterprises get clearly more value out of IT than their peers. An issue raised in the interviews was that if the CIO's responsibilities are broad it makes a sense to include CIO in the executive committee. Similarly, if the responsibilities of the CIO are narrow, for what ever the reason including the traditional IT manager role with little actual business contribution, it is not so obvious to include the CIO in the executive committee.

Figure 14 below shows how large proportion of CIOs is a member in the executive committee. As can be seen from Figure 14, 74% of CIOs were not members of the executive committee.

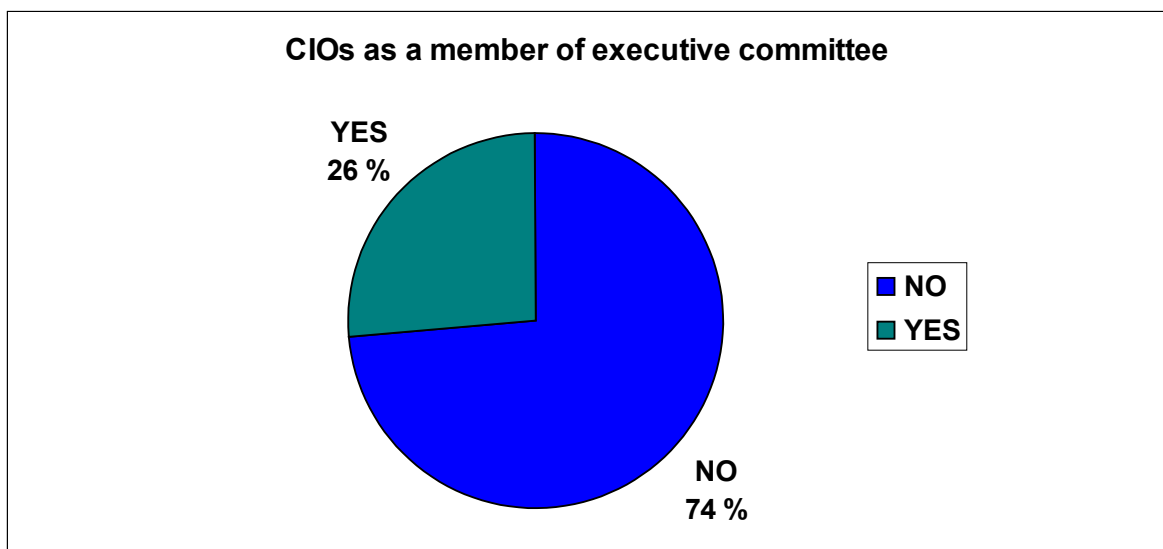


Figure 14: Is the CIOs a member in the executive committee?

When the CIO reports to the CEO, the CIO is often also a member of the executive committee. When the CIO reports to the CFO, the CFO is also more often responsible for IT at the executive committee level. One aspect typical for the arrangement of the reporting relationship between the CIO and the CFO is that kind of arrangement is often based on tradition or old habits followed by the enterprise. Typically, there has not been reasons to rethink the organization of the reporting relationship- or the role of IT for the business of the enterprise. Figure 15 below shows the percentages of CIOs reporting to CEOs, CFOs and other executives. 42% of the CIOs reported to CEOs. The percentage of CIOs reporting to CFOs was also 42% and the remaining 16% reported to other executives. Note that I have combined all responsible for the IT function under the CIO title whatever their title might be.

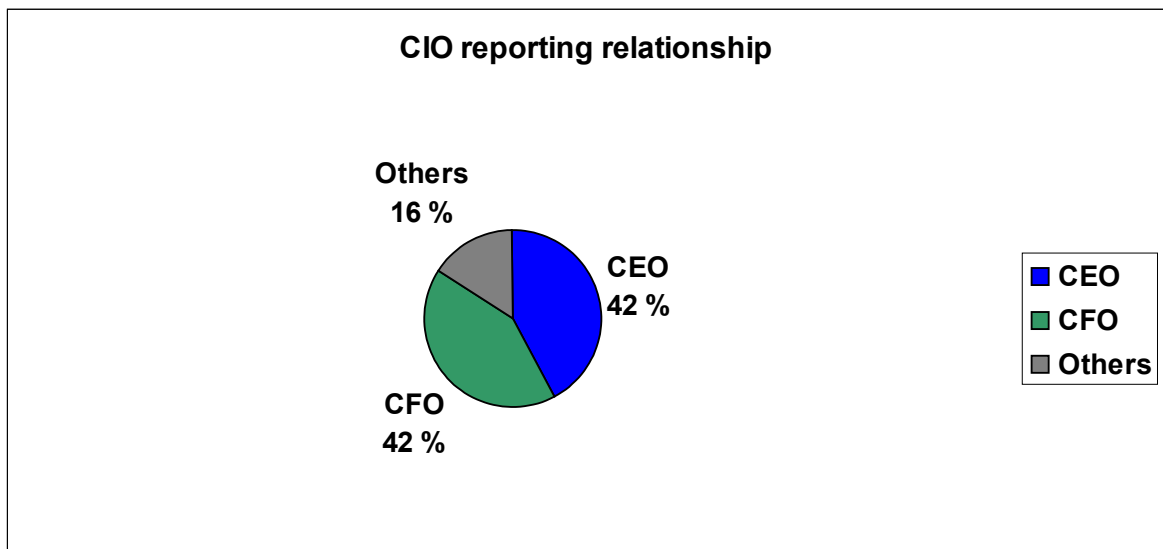


Figure 15: To whom do CIOs report?

We also asked what competencies and capabilities the CIO should possess to become a member in the executive committee. The two most important competencies were the requirement to have a strong and deep business understanding over the business of the enterprise, and the requirement to have a broad, holistic view over the operations of the enterprise. In addition, it was expected that the CIO should also have strong IT and process support competencies. Finally, excellent communications skills were emphasized. In conclusion, the weight of the required competencies was clearly on the capabilities of a member in the management team with priority on business

strategy execution, not in representing the IT function. Competencies required from the CIO are shown in Figure 16.

A question raised by some interviewees was why should the executive committee include the CIO? Shouldn't the HR director be part of the committee as well? Some interviewees pointed also out that the executive committee needs to be small in order to function effectively. Thus, those interviewees stated that the executive committee should only include the CEO and the main business (unit) leaders. Reviewed literature indicates that the executive committee should have member who bears the responsibility of IT (unless a specific situation otherwise indicates) for at least the following reasons: (1) Information and IT is one of the resources of enterprises similar to capital, labor and materials and there needs to be a person who bears the responsibility. (2) IT is increasingly intertwined to most processes, products and services and there needs to be a person with business – IT alignment responsibility (IT governance responsibility) who secures that IT is used responsibly and that IT provides business value. (3) IT both supports and enables business. To secure the deployment of the enabling role IT should be involved early on. IT is often also a slow mover. This kind of discussion was, however, not conducted with the interviewees since the aim of the interview was just to collect empirical data.

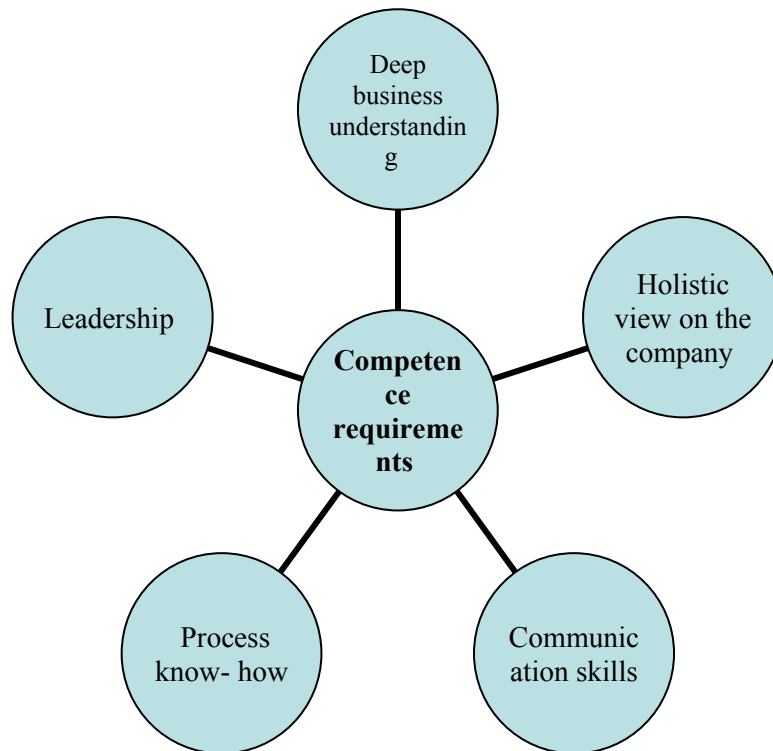


Figure 16: What competencies are required from the CIO in order for the CIO to become a member in the executive committee?

Most of the interviewed enterprises did not consider that there should be a separate IT representative (a person responsible for the IT) in the executive committee. On the other hand, as enterprises become more dependent on IT and its functionality, it is justified to consider how to involve IT in strategic planning early enough. If the CIO is not a member of the executive committee it is extremely important to empower the CIO to make strategic decisions outside of the executive committee by providing them with access to necessary information and decisions early on.

### 3.1.2 IT as a part of business organization and strategy

The second part of the interviews addressed business and IT alignment. We asked where the key IT decisions – such as IT strategy and IT investment decisions - were made. In the majority of the responding enterprises, IT strategy is approved by the executive committee or by some other business steering group. In some enterprises, the CIO or an IT board takes these decisions. Often in international enterprises, the

parent company approves local initiatives. In a couple of enterprises, the board of managers approve IT strategy. In many enterprises, the CIO manages the IT strategy process and the approval is more or less a formality. Yet, many CIOs underlined the lack of communication and interaction between business management and IT. The same is true also for IT strategy planning.

The CIO or an IT board is mostly responsible for IT infrastructure and IT architecture related decisions. Furthermore, there are typically also some other decision-making procedures and structures such as project specific decision-making and business unit level decisions.

We also asked the interviewees what role IT has in the interviewed enterprise's strategy planning and execution. The most typical answer was that IT does not play any role at all. IT strategy is most often designed by accepting the existing business strategy as the starting point for the IT strategy work. Yet, a few enterprises have seen the importance of connecting IT (strategy) to business strategy as early as in the strategy planning process.

Figure 17 below illustrates the weakness between the current business strategy and IT strategy planning practice typical to most interviewed enterprises. There is no alignment between the two strategies. IT strategy is developed and implemented after the business strategy has already been fixed and there is no feedback from IT to business for that reason. As the business strategy sets the direction and needs without any interaction with IT the consequence is that the enabling role of IT is lost entirely. Although there is not enough evidence to draw definitive conclusions it is very likely that these enterprises receive significantly less value from IT than their peers with an interaction between business and IT in business strategy planning and execution.

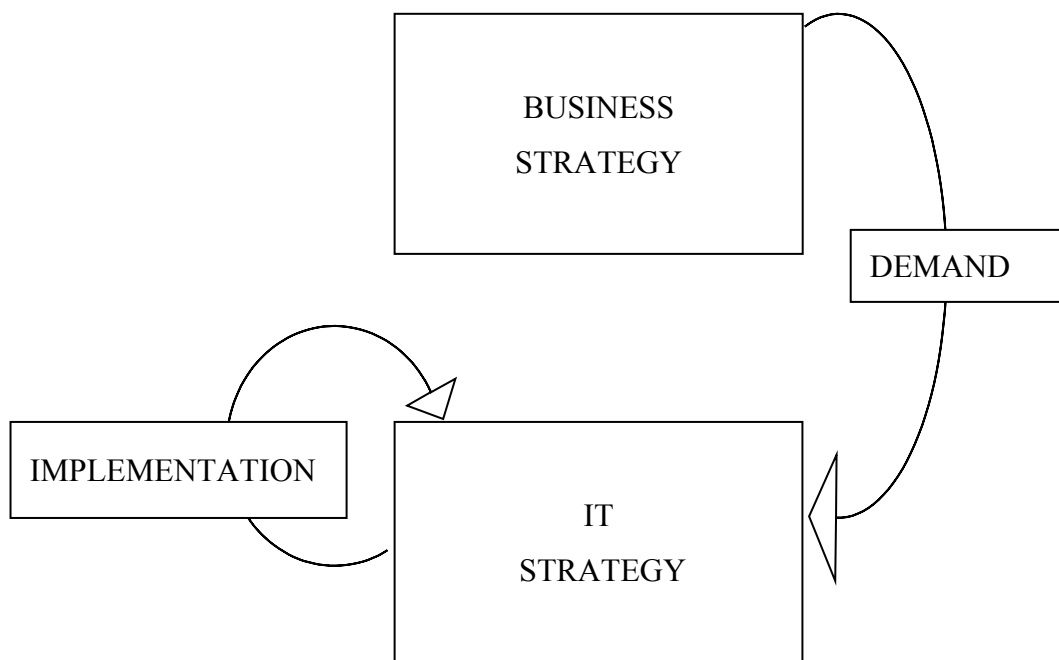


Figure 17: Lost interaction between business strategy and IT (strategy)

As the significance of IT in business continues to increase, the link between business strategy and IT strategy should be interactive. Business strategy should offer the direction for IT efforts. At the same time business strategy should take into consideration the restrictions and business possibilities offered by IT. Interactive planning, organization and execution of IT and business (strategies) is one of the most effective ways to ensure that IT brings maximum value to business. Figure 18 illustrates this kind of healthy link between the two.



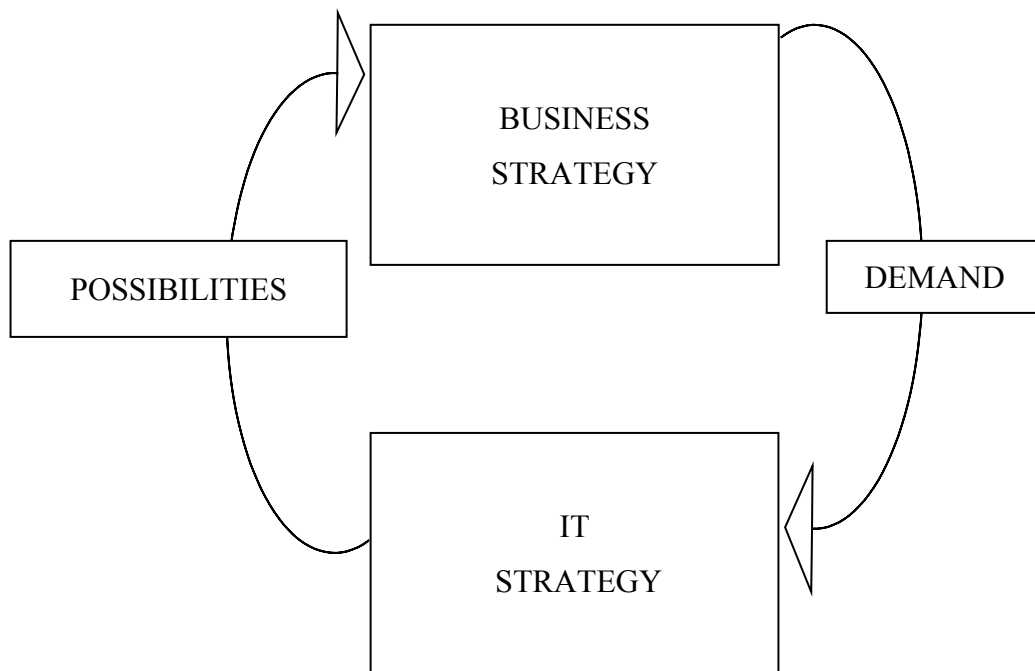


Figure 18: IT strategy linked to business strategy

The next section in the interviews addressed the alignment of business strategy and IT strategy. On the basis of the responses it seems that interviewed enterprises have mostly understood that on operational level IT affects significantly business and business functionality. On the basis of the interviews it is evident that most interviewees think that a majority of the operations in enterprises collapse if IT does not function. Again, only a few enterprises have understood the strategic level business and IT alignment and have put down a great amount of efforts to link IT and business strategy. These enterprises are either highly dependent on IT, or the CEO (and other senior executives) have understood and defined the value of IT for the business of the enterprise. Furthermore, the presence of a visionary and proactive CIO seems also to have a strong influence on the strategic level alignment.

In summary, most interviewed enterprises either struggle with the question how to align business strategy and IT (strategy) or they have not even understood the importance of the alignment. Not surprisingly, the biggest concern for most of these interviewees was that IT was not involved or did not have sufficient access to business strategy planning. In these enterprises IT is seen only from a narrow operational execution perspective, where business needs are just given to IT as

business demands At the other end of the spectrum were the few responses with the notion that IT and business strategies are hard to separate since they are so tightly interlinked.

Figure 19 simplified from the Strategic Alignment Model of Henderson and Venkatraman (1999, 1993) present the results of the survey. Figure 19 illustrates clearly the alignment problem between business and IT strategy planning in most interviewed enterprises. The sizes of the arrows represent the power of each factor. Business strategy sets the direction almost uni-directionally for IT strategy and different processes. The problem demonstrated by Figure 19 in addition to the lack of interaction between business and IT strategies is that business strategy sets direction without taking into account organizational skills, possibilities and restrictions. This finding is important since most contemporary strategy methods apply the resource-based view where strategic advantage is sought from the strengths of the enterprise. It appears that in reality, the dialogue between business strategy, IT strategy and different organizational processes is vague or non-existent. It seems that in most of the interviewed enterprises senior executives define business strategy in isolation without considering IT restrictions and possibilities. Similarly to IT, organizational skills and competencies should be taken into consideration already in the strategy planning phase. As can be seen from the sizes of the arrows, the other affecting factors do not have significant impact on the business strategy either. This is another indication about the existence of the alignment gap in business strategy planning and execution. Still, some of the arrows are in balance representing a harmonized dialogue.

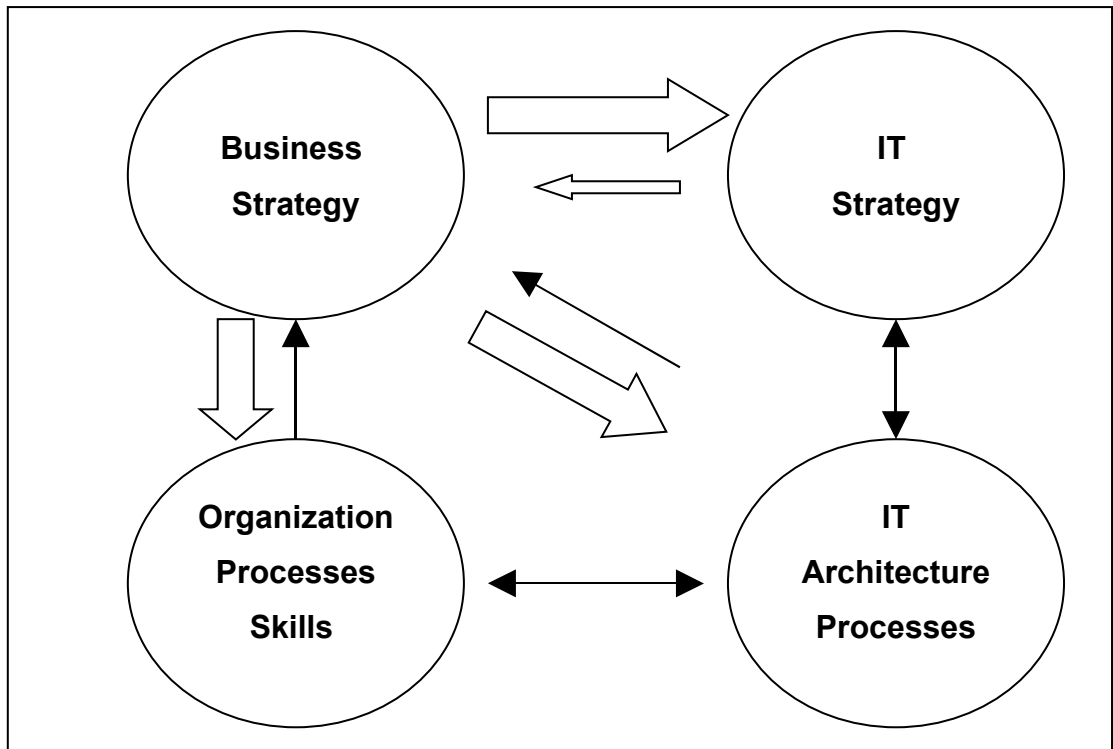


Figure 19: Strategic alignment according to the results of the interviews

### 3.1.3 Expectations to IT

*“IT is expected to function so that it is not even noticed.”*

The next question was what the expectations of the executive team regarding IT are. There seems to be many requirements for IT. The key expectations are that IT is reliable and cost efficient. The fundamental requirement is that IT shows solid reliability to the extent that it is not even noticed.

In addition to operational efficiency and reliability, business executives have or perceived to have other operational expectations such as the requirement to manage projects so that they meet deadlines and budget. Examples of strategic expectations include support for business agility, a stronger role in business value creation, an active role in innovation and in support for long term planning, and the ability to increase the competitiveness of the enterprise. The dilemma between the operational and strategic expectations was described by one interviewee in the following way: “If

the systems run well, this will not bring any competitive advantage, but if they don't work, the edge will be lost entirely". Figure 20 summarizes expectations placed on IT.

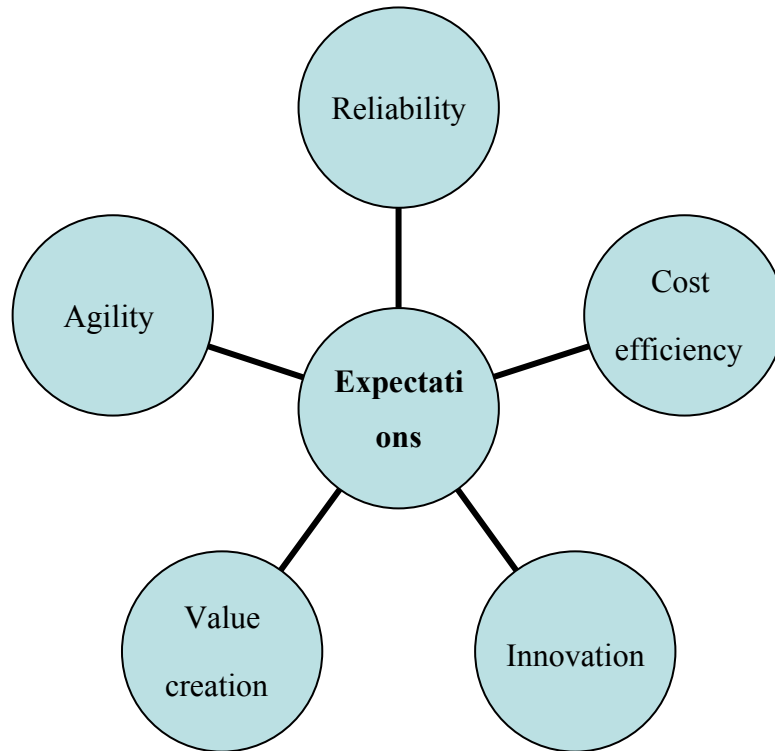


Figure 20: What is expected from IT?

The final question of this section was how the executive committee takes IT into consideration when making strategic decisions. In almost 80% of the interviewed enterprises IT was not taken into consideration at all. Again, the same small group of advanced enterprises in IT management considers IT aspects very carefully prior to making strategic decisions.

### 3.1.4 Measurement and metrics

The final section of the interview questions addressed the measurement procedures of IT and its business impact. The measurements and metrics of IT were a difficult issue to get any answers. The most often mentioned metrics by the interviewees were service levels and the quality of the end products produced by the enterprise. Yet, how

IT is affects service level or product quality was difficult to describe – apparently because the impact is not measured. Furthermore, it was challenging to the interviewees to describe how service level, product/service quality or IT’s other business impact could be measured should such measures exist. The obvious conclusion is that the business value of IT is not measured – systematically or at all - in the interviewed enterprises.

Typical metrics for measuring the impacts and quality of IT are:

- Customer/user satisfaction
- IT costs as a percentage of turnover
- ROI
- Service level
- Number of system or IT service failures


The most common measurement instruments for IT performance are according to the interviews customer/user satisfaction, service levels for the most critical systems, and IT cost reporting. Return on investments is considered a valuable tool when the financial feasibility of IT investments is evaluated, typically prior to investment decisions. Still, ROI is considered to be challenging to measure.


An important finding is that IT risk evaluation is considered to become more important in the future since uninterrupted operation of key information systems is a critical factor for the success of enterprises as an important elements of business continuity.. At the moment, IT risks are evaluated and monitored only ad hoc, that is at some levels or at some irregular points of time. Another significant related finding is that in most enterprises their businesses will collapse within a couple of hours should the IT systems collapse. The obvious conclusion is , that IT risk and continuity management is an area to which enterprises need to devote much work in the future. Currently improved IT risk mitigation appears to be more critical than the costs of IT.

“IT risks are a part of business risks; those risk management areas are not separate..”  
“We have systematic plans for IT risk mitigation.” In these citations IT is seen as an enabler for enterprise risk management. Other comments stated: “IT risks are not

measured, IT risks are only estimated”. In this comment the role of IT is seen in the role of risk implementer. Business requirements set the goals, which IT needs to fulfill. The similarities between business risk and IT risk alignment and business strategy and IT strategy alignment are not coincidental.

### 3.1.5 Conclusions

Figure 21 describes two different IT management focuses derived as the result of the interviews. The -area shows how the large majority of the interviewed enterprises approach the business and IT alignment issue. Their perception of IT is rather operational and their focus is on the relation between IT strategy and IT processes. The biggest IT concerns of these enterprises are operational and cost efficiency. IT is expected to provide very high usability and reliability but also to be as invisible as possible. There is either an implicit and/or explicit target to minimize the cost level of IT. In those enterprises IT and IT management issues have low or medium priority on the agenda of the senior management.

The -area in Figure 21 describes the business and IT alignment approach of enterprises which view IT from a strategic perspective. The reliability and cost-efficiency of IT are still fundamental requirements – or prerequisites to the strategic use of IT - but in terms of IT value delivery these enterprises have higher expectations and ambitions. They take efforts to make business and IT interact in order to better link IT to the execution and development of their business including also IT enabled initiatives. The characteristics of these companies are that 1) they are in a highly IT-dependent business or have a long history in the use of IT and/or 2) they have a visionary CEO and/or executive committees who enable proactive deployment of IT and/or 3) they have an experienced, innovative and business-oriented CIO who both drives and is capable to implement this type of strategic perspective.

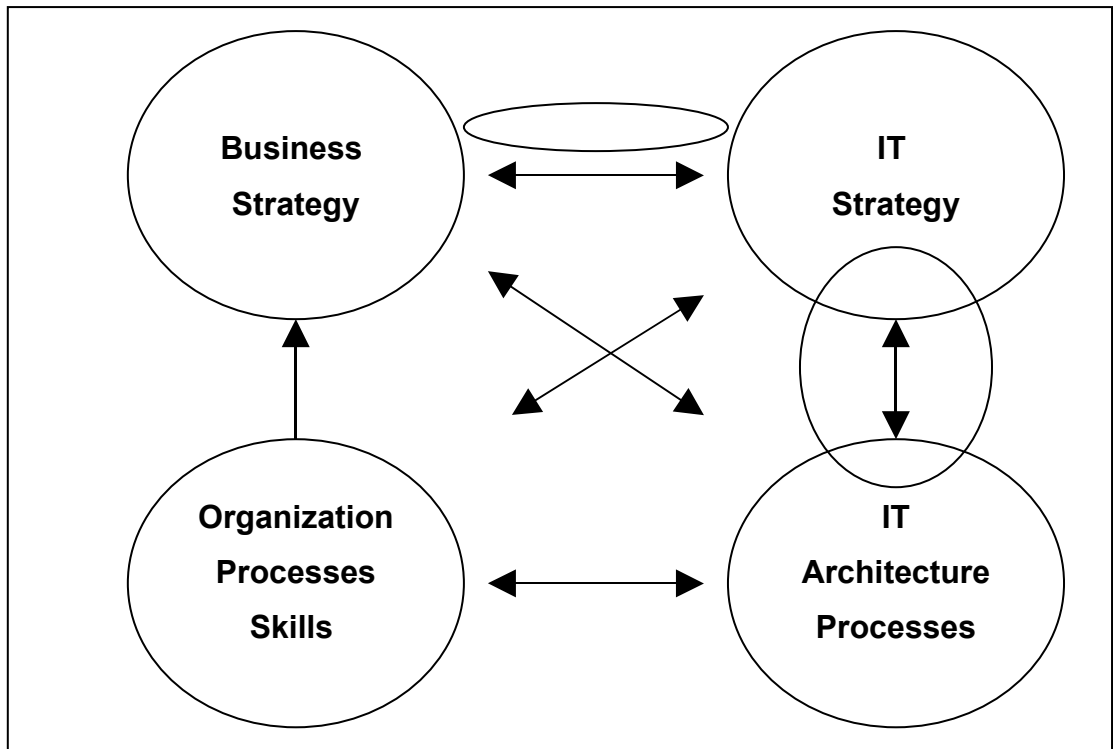


Figure 21. Summary of the survey; operationally- and strategically-oriented enterprises on the issue of business and IT alignment

## 4. DISCUSSION

Two research questions were raised in the first chapter of this thesis. The first question was who guides the CIO and should the CIO be a member in the executive committee. The second question was what role IT plays in business strategy planning and execution. It is now time to return to those questions.

### *4.1 The role of the CIO*

To provoke discussions with the interviewees we (=Jarmo Nykänen and myself) proposed to them that the CIO should be a member of the executive committee and report to the CEO. I also reviewed earlier studies, reports and other sources to see whether such propositions are supported by prior knowledge and discovered that such propositions have strong support in literature reviewed.

The CIO's role has been seen to evolve towards the role of a business executive. The inclusion of a CIO – meaning a person who is responsible for business and IT alignment and the business value delivery of IT - into the executive committee has been recommended repeatedly in order to improve the dialogue and allocation of IT responsibilities between senior, business unit and IT executives, to better align business and IT, to establish business-priority-related IT services, risk management and IT development initiatives with related relevant reporting, and to facilitate the deployment of IT in innovations and in business agility support. Another line of reasoning is that information and IT is a key driver for economic growth, process efficiency development and innovations both at national and enterprise levels. Is it possible for senior and business unit executives to allocate the responsibility of these opportunities to CIOs/persons who are not an integral part of business planning and execution?

The above points were apparently missed in the interviews although our propositions did provoke discussion. The position and the role of the CIO were discussed as



organizational position issues rather than from the perspective of tasks of a business executive with IT responsibilities. In 24% of the responding enterprises the CIO was a member in the executive committee and 42% of them reported to the CEO with another 42% reporting to the CFO. Most interviewed CIOs said that it is not necessary for them to be members of the executive committee. Rather they argued for the empowerment of CIOs to participate in strategic decisions in order to integrate IT and business needs. On the other hand, most respondents stated also clearly that CIOs are expected to be business-oriented and to understand the business of the enterprise deeply. One possible explanation for these two findings, which appear paradoxical, is that the pressures for executive competencies in the CIO's profession are felt but that the consequences are not similarly understood. For example, it is possible to ask how CIOs are able to be business centric and understand the business deeply if they do not participate into business planning and execution? Ability to proactively develop new IT services, improve IT service delivery and IT risk management also requires access to business goals and priorities not to mention IT-enabled innovations.

We asked also does it matter to whom the CIO reports and does the CIO's business executive role fall to some other executive(s) if the CIO is a technical expert. The results of the survey indicate clearly that the reporting relationship does matter. CIOs who are members of the executive committees and/or report to the CEOs have broader and clearly more business-aligned roles than other CIOs. CIOs who are business executives ensure that business-critical IT services are delivered reliably and effectively but they also emphasize that IT is just a part of business strategy planning and execution in both supportive and enabling roles. They also know how to execute the alignment of business and IT. For example, one such interviewee stated that the respective enterprise does not have IT projects only business improvement projects. On the other hand, CIOs who are IT experts do not qualify to be executive committee members and seldom report to CEOs. They see that IT has a limited supportive role in business strategy planning and execution. Similarly, the question of providing metrics on IT performance and IT risks with business relevance resulted mainly in confusion and/or in no response at all. In these cases the CIO's business executive role most likely falls to their superior the CFO, to some other executive(s), or is lost to the disadvantage of the enterprise.

I conclude that the issue is not whether the CIO is a formal executive committee member but that such a role is recognized and is considered as one of the executive committee's responsibilities. The person who is accountable for this responsibility needs to participate actively in business strategy planning and execution with sufficient IT skills. As a whole, the responsibilities of the CIOs continue to grow in line with the importance of IT for business. I found more IT managers whose responsibilities cover traditional IT issues than IT executives with business executive agenda combined with IT skills. Yet, the latter group provides significantly more value to their enterprises, is more influential and respected, and has broader administrative and business roles. They are champions in their own field.

#### ***4.2 The role of IT in business strategy***

I stated in chapter one, that the need to align business and IT is generally accepted. The results of the survey confirm this statement as the need to align business and IT were emphasized in almost all interviewees. On the other hand, the results of the survey demonstrate equally clearly that only a handful of the interviewed enterprises do that or know how to do that.

To clarify this issue in the interviews we asked should the IT function and CIO take business strategy as the starting point of IT strategy with limited feedback to business strategy or should IT strategy also provide input to business strategy? Further we asked does it matter whether this relation between business and IT is unidirectional (IT seen in supportive role) or interactive (IT seen in supportive and enabling roles)? Not surprisingly, the responses divided almost in the same way as responses on the role of the CIO. Enterprises which had defined the business role of IT, and where CIOs were business executives, had created more or less sophisticated mechanisms for the alignment of business and IT. In these enterprises IT (strategy) was integrated with their business strategy process.

The finding discussed above means that the majority of the interviewed enterprises appeared not to know how to proceed from the idea of alignment into concrete activities. Some appeared to have even fallen into the so-called alignment trap, where

IT tries to fulfill business requirement but the result is a fragmented inefficient and expensive IT architecture. The alignment trap also means that although the IT function desperately tries to fulfill IT requirements demanded by business units they in the long run fail to deliver value to business typically since there is no overall plan based on consistent business priorities, since IT is not involved in business strategy planning, and since the relation is entirely unidirectional from business (strategy) to IT (strategy) (Shpilberg et al. 2007). Figures 17 and 19 shown in chapter 3 illustrate this issue. In those enterprises IT strategy is not connected to business strategy but is a separate task or process.

One may ask what the role of the CIO is in the alignment of business and IT strategies. This role is illustrated in Figure 22. Figure 22 shows the interactive repetitive cycles of business and IT alignment, operational IT service development and delivery, IT performance and risk management reporting, and IT business value creation. CIOs typically have facilitator, executor and manager roles in this process.

My conclusion is that acquiring competencies to better align business and IT is an increasingly burning issue for a large number of large Finnish enterprises. The CEO's understanding of the strategic role of IT, the IT-intensity of the industry and/or long IT history as well as the CIO's personal competencies appear as the main determinants for the maturity of business and IT alignment.

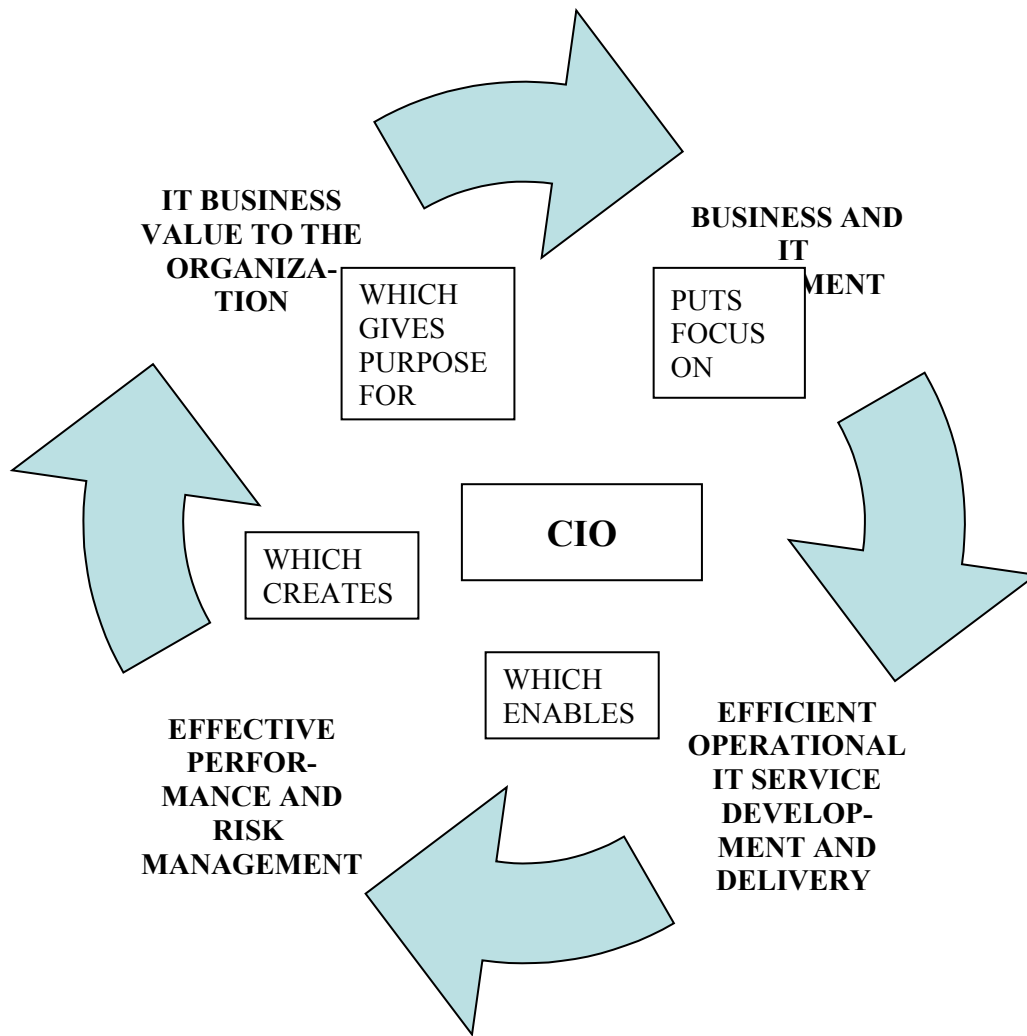


Figure 22. The CIO's role in the strategic alignment of business and IT

## 5. CONCLUSIONS

### *5.1 Main Findings*

The CIO's role has already evolved into that of a business executive in IT-intensive industries and enterprises. In many other enterprises, the challenge is how to manage the transformation of technically-oriented IT managers into business executives without losing necessary technical competencies.

From the CIO's perspective it is more critical to have access to strategy planning and execution than to have a high organizational status with no such access. The CIO needs not to be a formal member in the executive committee, if the CIO has continuous access to and an active role in the business strategy process and if the needs to organize the executive level responsibilities of IT are understood by the CEO and/or executive committee members. Within this context, the empowerment of CIOs to make strategic decisions will increase the value delivery from the use of IT.

Still, one of the easy means to improve the business value delivery of IT is to have the CIO to report to the CEO. This will improve the linkage of business and IT strategies in a natural way. The mentioned impact can be boosted if the CIO is made a member of the executive committee.

What should an enterprise do if the enterprise wishes to strengthen the alignment of business and IT strategies? IT governance understanding of the CEO and the executive committee members has been pointed out already several times. Evaluation of the status of IT governance at an executive level and need-based coaching in IT governance are some suitable starting points. To carve out more value from the use of IT an enterprise needs to establish a close and interactive relationship between business and IT strategy processes. To establish IT strategy as a standard part of the entire strategy process with cross-checking is one of the easiest means to organize this interaction.

## ***5.2 Managerial Implications***

The purpose of the thesis was to examine the role of the CIO in the executive committee as well as the reporting arrangements in the organizations. I also investigated how enterprises perceive the role of IT in business strategy planning and execution. Based on the findings of this thesis I offer the following suggestions:

There should be a person responsible for IT in the executive committee since today information and IT is everywhere in enterprises with significant performance impacts. It has been emphasized several times that it is not always meaningful to include the CIO in the executive committee. Yet, I again underline that the CIO should be empowered to make strategic decisions. Especially in IT extensive organizations, it is natural that the CIO participates to most executive committee meetings since various projects and strategic decisions have significant IT implications.

The other notion concerns the reporting relationship. I discovered that when the CIO reports straight to the CEO, the alignment of business strategy and IT strategy is closer. Thus, it is suggested that the CIO should report to the CEO since such an arrangement results in more business valuable IT investments and IT services use.

The final recommendation is that organizations should put more effort on the alignment of business strategy and IT strategy. Far too often the communication only goes from business to IT, yet in the business strategy planning the restrictions and possibilities of IT should be taken into consideration early in the process.

## ***5.3 Suggestions for future research***

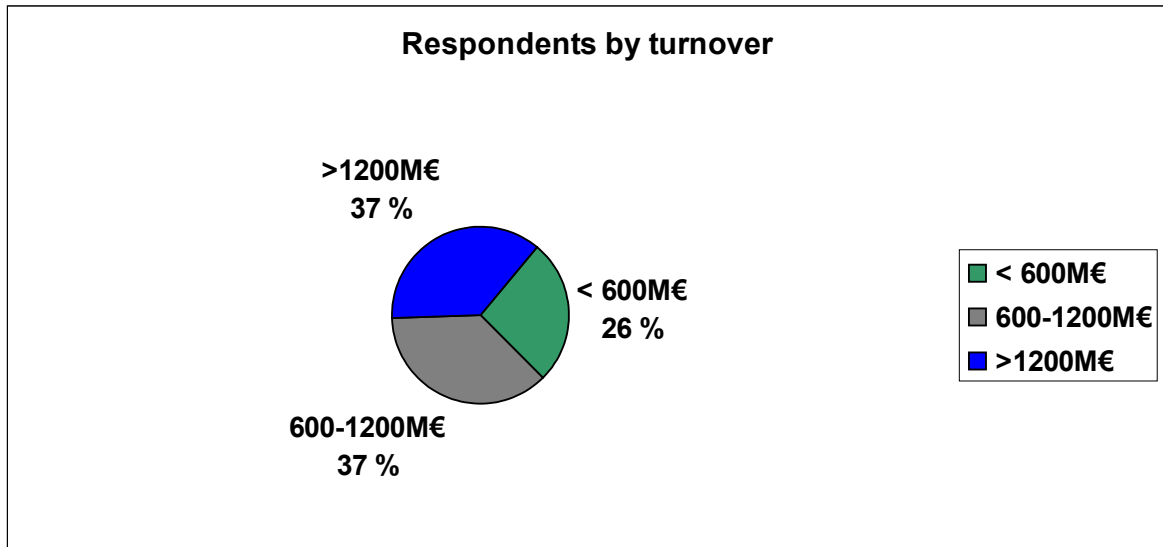
This thesis has examined the role of the CIO in Finnish organizations. The interviewees were concentrated on CIOs, yet I also interviewed some CEOs and CFOs. The purpose was to gain deep insight of the topic by focusing to the Finnish top 40-100 enterprises.

My thesis opens up several interesting venues for future research. Since the thesis is not concentrated on any specific industry, a suggestion for future research is to examine what kind of differences there are between industries. One could also approach executives with various professional positions, such as CFOs, COOs etc. and explore differences and similarities in their views.

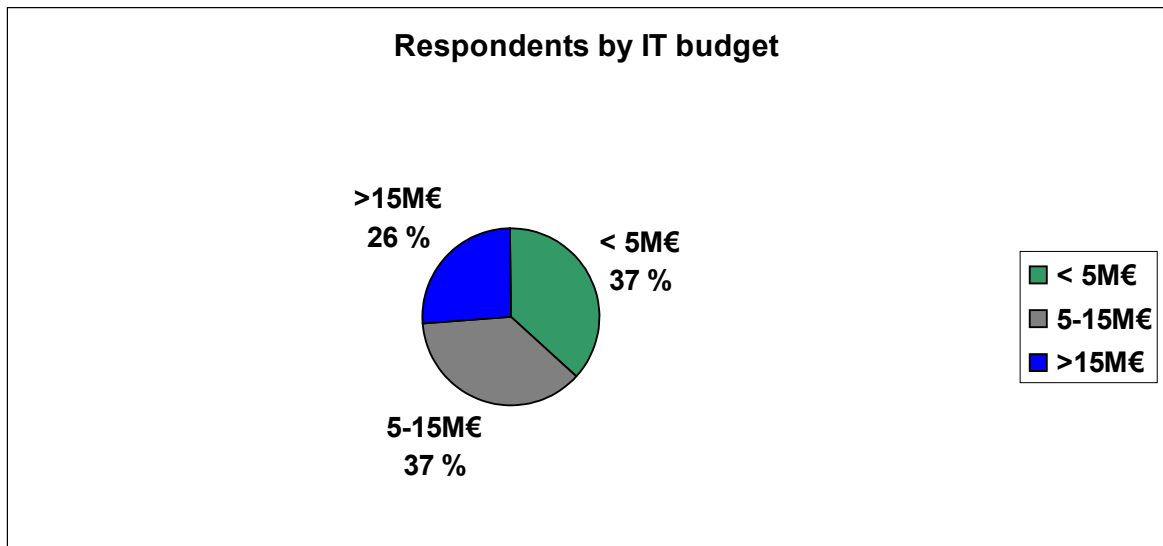
Another notion is that, enterprises appear to seek for methods by which they could implement strategic alignment between business and IT. Most enterprises understand the importance of the alignment, yet there is a lack of guidelines on how to actually implement the process. This issue offers a lot of possibilities for future research.

## 6. APPENDICES

Appendix 1: Respondents by the turnover of their enterprises

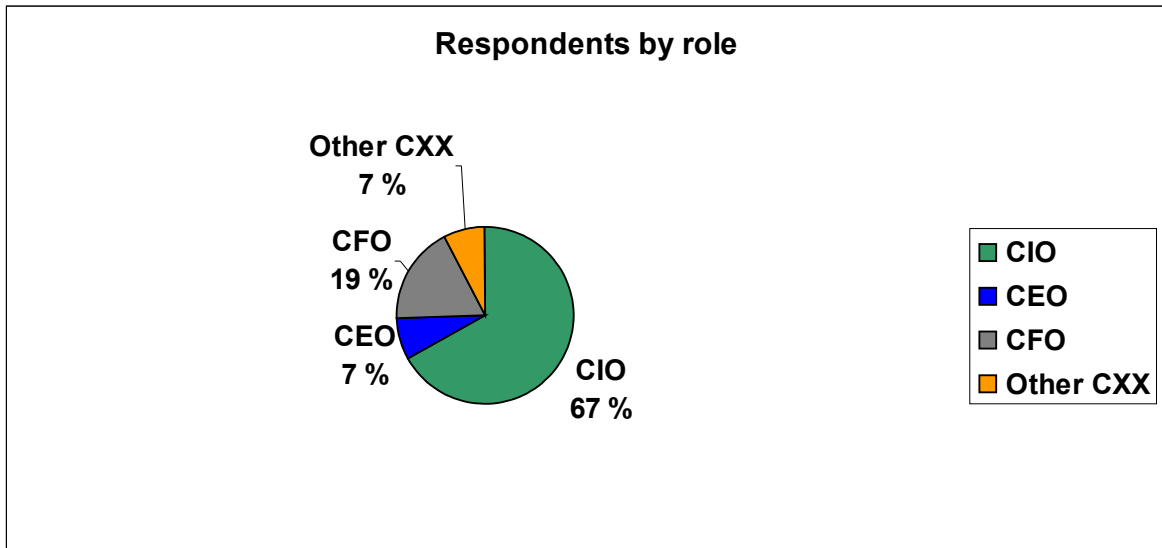


Appendix 2: Respondents by the IT budget of their enterprises





Appendix 3: Respondents by role



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