ORGANIZATIONAL CULTURE AND STRUCTURE INFLUENCE ON INFORMATION TECHNOLOGY GOVERNANCE

Parisa Aasi
Organizational Culture and Structure Influence on Information Technology Governance

Parisa Aasi
This thesis is dedicated to my parents Professor Mostafa Aasi and Hamideh Mahrouyan who taught me lessons of life, love and patience.
Abstract

Information Technology (IT) is used in many firms today and plays different roles such as technical, operational and strategic. Therefore the degree of firms’ success in using IT is very important. Managers also face enormous challenges to plan and make decisions on rights and responsibilities in order to reach the desired IT behaviors that are aligned with the business objectives of organizations. This is known as IT governance and, not surprisingly, it is crucial for organizations to find the influencing factors in IT governance and solve the problems associated with it. One of the factors that has an influence on many issues of the organizations is culture. Culture at different levels can influence the organizations in implementing IT governance and reaching their business objectives.

This research aims to ascertain how organizational culture and structure can influence IT governance. As the first step, the gaps in the area were found through a review of previous literature. Then the role of organizational structure in IT governance project implementation was analyzed through a case study in a large construction company in Sweden. Finally, the role of organizational culture type on IT governance performance was analyzed through another case study in the IT department of a global construction company headquartered in Sweden.

The literature survey provided evidence that the role of organizational culture and structure in IT governance has gained little attention from researchers in previous years and the research in this specific area is very scarce. Through the performed case studies, it was found that the organizational structure needs to support the IT governance practices while implementing an IT governance project. Furthermore, it was concluded that the culture type orientation influences the IT governance performance in the firms. More particularly, the current clan culture orientation of a firm influences the cost effective use of IT outcome of IT governance performance. Additionally, the preferred adhocracy type of organizational culture is related to the required improvement in the outcome of effective use of IT for growth in IT governance performance. This research provides evidence that there is an influence by the organizational culture on IT governance. It also suggests the need for a more in-depth research in this area in future research to create an IT governance organizational culture framework.
Acknowledgments

This thesis represents half of my journey in my PhD studies, which is a very important step in my life. There are many things needed to learn to be able to do research, my goal is to become a good researcher and to make a contribution in the field. I hope my research in the topic of organizational culture and structure influence on IT governance has made some contribution to the body of scientific knowledge. However in my three years of research and teaching from the beginning of my PhD studies I was not alone. I would like to acknowledge some of the people who helped me in these years.

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Stockholm, January 2016
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### Abbreviations

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<tr>
<td>ABW</td>
<td>Activity Based Workplace</td>
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<tr>
<td>CIO</td>
<td>Chief Information Officer</td>
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<tr>
<td>DSV</td>
<td>Department of Computer and Systems Sciences of Stockholm University</td>
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<tr>
<td>IEC</td>
<td>International Electro technical Commission</td>
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<td>IS</td>
<td>Information Systems</td>
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<td>ISACA</td>
<td>Information Systems Audit and Control Association</td>
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<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>ITG</td>
<td>Information Technology Governance</td>
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<td>ITGI</td>
<td>Information Technology Governance Institute</td>
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<td>ITP</td>
<td>Case study 1 project anonymous label</td>
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<td>ITS</td>
<td>Case study 2 IT department anonymous label</td>
</tr>
<tr>
<td>MIT</td>
<td>Swedish Research School of Management and Information Technology (Forskarsskolan Management och IT)</td>
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<tr>
<td>OC</td>
<td>Organizational Culture</td>
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<tr>
<td>OCAI</td>
<td>Organizational Culture Assessment Instrument</td>
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<tr>
<td>PM</td>
<td>Performance Measurement</td>
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<td>RK</td>
<td>Risk Management</td>
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<td>RM</td>
<td>Resource Management</td>
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<td>SA</td>
<td>Strategic Alignment</td>
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<td>VD</td>
<td>Value Delivery</td>
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1. Introduction

Information Technology (IT) is potentially the key driver of economic capital in the twenty-first century. It is becoming more and more evident that it enhances an enterprise’s capacity for survival in today’s highly competitive world (Benbasat and Zmud, 1999; ITGI, 2003). Managing IT is therefore one of the top concerns of managers today (ISACA, 2011). It was revealed by ISACA (2011) in a survey that IT management together with IT governance in an enterprise are the second most important issues for businesses.

IT Governance (ITG), which deals with people’s rights to make decisions about IT, is an important factor in the firms chasing for returns from the IT investments they make and also in achieving competitive advantages over the other companies without an effective IT governance (Weill and Ross, 2004). IT governance is part of corporate governance; the consistency between these to leads to devastating results. IT governance will be effective only if senior managers specify the enterprise performance objectives and design IT governance to achieve desirable IT behaviors aligned with those objectives. The bankruptcies of major corporations such as Enron and Worldcom and their accounting firms in 2001 are simple examples of the truth of this statement. Such events in the past have elevated IT governance to such a high position of importance in both research and practice today. It is stated by Ping-Ju Wu et al. (2015) that there is an impactful linkage between IT governance, strategic alignment and organizational performance in firms. Ferguson et al. (2013) stress the role of IT governance, considering the relationship between the ownership and control structures of the firm and IT performance. Consciousness of how critical IT governance can be for the organizations made the enterprises interested to learn more about achieving effective IT governance. They also consider different factors that can influence the governance of IT. Regarding this goal, it is necessary to know which elements inside and outside the firm can influence IT governance and how negative or positive the result of those elements might be. Significant previous works by IT governance researchers have focused on the IT position in a firm and different frameworks of IT governance (Brown and Grant, 2005 De Haes et al., 2011; Weill and Ross, 2004). Nevertheless, research concerning the factors that can influence the IT governance is absent (Willson & Pollard, 2009).
A driving factor influencing many aspects of the firms is the organizational culture (OC) that can be defined as “the set of shared values and norms that control organizational members’ interactions with each other and with suppliers, customers, and other people outside the organization” (Jones, 2007, p.177). In fact, culture plays an important role in the implementation and use of IT in organizations (Walsham, 1995).

The literature on management shows that national and organizational cultures can influence companies’ performance and IT governance and there is a need for greater studies on interdisciplinary fields that bridge the IT and organizational studies and identify how they interact with each other (Alvesson, 2012; Brown and Grant, 2005; Chong et al., 2012; Kanungo et al., 2001; Kingsford et al., 2003; Leidner & Kayworth, 2006; Orlikowski & Barley, 2001; Palvia & Pinjani, 2007).

1.1. Problem Field

As stated earlier, the role of IT within organizations is changing from an operational role to a more strategic role and this fact consequently stresses the need for making sure that IT is properly managed (Lunardi et al., 2014). One of the most important IT challenges that organizations face today is in fact not related to technology but related to the way they govern their IT, or so-called IT governance (Bergeron et al., 2015; Nfuka & Rusu, 2010). Researchers and practitioners are even thinking one step further and assume that organizational culture is at some point influencing the organizational performance, specifically when guided by technology (Alvesson, 2012). Leidner and Kayworth (2006) believe that culture is a crucial dynamic, which explains the interaction among social groups and IT in an organization.

Moreover, organizations need to match their technology with their organizational environment to achieve the optimal value from their IT (Hester, 2013). Information systems and IT governance should be reflected in the design of the organization’s (IT department’s) physical structure. According to Pearlson and Saunders (2013, p.78) “ideally, an organization structure is designed to facilitate the communication and work processes necessary for accomplishing the organization’s goals”. An organization’s strategy, business strategy and IS strategy should be coordinated with each other and any change in one of them should be seen by the others and necessary changes in the other two should be applied. According to Pearlson and Saunders (2013, p.79), “organization structure is the way of designing an organization so that decision rights are correctly allocated”. While implementing a new IT governance project, it is crucial to consider the new decision rights and create an organizational structure that supports the IT
governance implementation and is also aligned with the business goals. Jones (2007) also emphasizes that the aim of organizational structure is to control how people coordinate their actions, how the resources are used and how the decisions are made in order to achieve organizational goals. This is very important while implementing IT governance projects, since IT governance also aims to direct people’s behavior and decision rights in order to bring value from IT to the business. Consequently, it is very important to find the supporting organizational structure while implementing IT governance. Therefore, organizational culture and structure should be considered as critical components of the organizational strategy. IT governance is a crucial area of Information Systems (IS), which has gained a greater attention in the last decade, but yet there still remains a gap in explaining how the organizational culture and structure of a firm can influence the IT governance.

1.2. Research Questions

This thesis aims to answer the question, “What are the influences of organizational culture and structure on IT governance?” Three sub-questions together can provide the answer for the general research question.

Research question 1: “What is the current state of research on the role of culture on IT governance structure, relational mechanisms and processes?”

Since the research in this field is still scarce, as a first step this thesis aims to find out which areas of IT governance have gained some attention from the cultural point of view, where the gaps are and which future research topic is the most beneficial in this field.

Research question 2: “What organizational structure supports IT governance implementation in a firm?”

When firms are working on implementation of an IT governance project, there are many aspects and other parts of the firm that can be affected by the implementation which need to be changed. The answer to this question sheds light on the special organizational structure needed for implementing IT governance in a firm.

Research question 3: “What are the influences of organizational culture on IT governance performance in a firm?”

This question is in fact the result of answering the first question. The answer to the final question will shed light on the organizational culture issues that influence the IT governance performance, which is one of the most important focus areas of IT governance.
1.3. Included Publications

**Paper – I**  

**Paper – II**  

**Paper – III**  

Figure 1 represents the focus of published papers in relation to this thesis goals.

![Organizational Culture and Structure Influence on IT Governance](image)

*Figure 1. Published papers in relation to the research goals*

In total there are three research papers as “included papers” in this thesis. The contribution of Parisa Aasi (as the first author) in the papers I and III were in conducting the research, results, analysis and conclusions and also in writing the papers (eighty percentages). In the paper II Parisa Aasi ‘s (as the third author) contribution was in defining the research perspective and conclusions and in writing of the paper for publication (forty percentages).
1.4. Related Publications

**Paper – I**

**Paper – II**

**Paper – III**

**Paper – IV**

1.5. The Research Focus in Relation to Research in DSV and Swedish Research School of Management and Information Technology (MIT)

One of the missions of the Department of Computer and Systems Sciences (DSV) is to provide research and education in computer and systems sciences, including in IT management. The same is true of the Swedish Research School of Management and Information Technology (MIT) (Forskarskolan Management och IT), which funds researchers from different universities in Sweden who are conducting research in the areas of IT and management and also in an interdisciplinary area like IT management. One research topic that has gained attention in recent years at both DSV and MIT is IT governance. The research in this topic has focused mainly on studying the influence of organizational culture and structure on IT governance.
1.6. Disposition

The thesis is structured as follows. The first chapter comprises the introduction, describing the background of the thesis, the research problem, the research questions and the included papers. The next chapter describes the extended background and introduces the concepts used in this research with reference to the previous research literature. The third chapter represents the research methodology, describing the scientific approach used to perform this research. The fourth chapter presents the results and analysis. Finally, the fifth chapter includes the concluding remarks, limitations and recommendations for further research.
2. Extended Background

In this chapter, the concepts used in the research are introduced. The extended background chapter first introduces different issues regarding IT governance, such as definitions, frameworks, standards and focus areas. Then the concepts of culture, organizational culture and structure are introduced. Finally, the importance of culture in IT governance research is described with reference to previous literature and sources.

2.1. IT Governance Concept

IT governance is an issue that has received increasing attention in research and practice since the mid-nineties (Simonsson & Johnson, 2006). Before defining IT governance, it is beneficial to first mention the broader concept of corporate governance. Corporate or enterprise governance is the “system through which the organization is controlled, monitored and organized” (Van Grembergen & De Haes, 2009, p. 4). IT governance consequently is a part of corporate governance. Since today it is very rare to find organizations without a dependency on information systems, it is not surprising that corporate governance is related to IT governance to a high degree. Regarding the definition of IT governance, different researchers and practitioners have presented various ideas based on their experience, best practices and knowledge. The IT Governance Institute (ITGI) defines IT governance as “the responsibility of the board of directors and executive management. IT governance as an integral part of enterprise governance 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” (ITGI, 2006, p.10). Simonsson and Johnson (2006) have done a review of 60 articles and they also propose a definition for IT governance, and according to them, “IT governance is basically about IT decision-making: The preparation for, making and implementation of decisions regarding goals, processes, people and technology on a tactical and strategic level” (p. 14). The authors then suggest that in order to assess the effectiveness of IT governance, the above factors from their definition need to be considered. Weill and Ross (2004) also call IT governance effective when it addresses and clearly specifies the three following issues: the necessary decisions for the management and effective use of IT; people
having the right to make those decisions; and how those decisions will be applied and monitored. In this paper, we have used the definition that Weill and Ross (2004) gave: “IT governance is defined as specifying the frameworks for decision rights and accountabilities to encourage desirable behavior in the use of IT” (p. 2).

2.1.1. IT Governance Focus Areas and Models

There are five focus areas for IT governance that has been introduced by ITGI (ITGI, 2006), which are: Alignment (SA), Risk Management (RK), Resource Management (RM), Value Delivery (VD) and Performance Measurement (PM). According to Sambamurthy and Zmud (1999) there is a considerable difference between organizations selected model of IT governance. The authors mentioned three primary arrangements of IT governance developed during seventies to nineties and which are centralized, decentralized and federal governance. Sambamurthy and Zmud (1999) have defined these three arrangements as following:

1. In centralized IT governance the central corporate governance has all the decision rights for governing the IT functions in all over the organization.
2. In decentralized governance of IT, the units for different IT functions have the authority for making decisions for their relevant IT activities.
3. In federal mode of IT governance both the corporate IS and business units have the authority for the IT activities depending on the tasks and the projects characteristics.

In a recent study done by Urbach et al. (2013), a model is presented for successful IT governance including its factors and impacts. The authors suggest seven success determinants of IT governance i.e. “comprehensibility of the regulations, the adequateness of the regulations, the persuasiveness of the communication, top management commitment, financial and human resource support, the integration of business and IT perspectives and the business orientation of the IT staff” (Urbach et al., 2013, p. 7). Moreover the authors argue that these determinants contribute to the whole organization success regarding IT.

2.1.2. IT Governance Framework of Structures, Processes and Relational Mechanisms

According to Peterson (2004), IT governance is an integration of strategies and tactics. The author suggests that IT governance can be developed through a combination of specific structures, processes and mechanisms. Van Grembergen and De Haes (2008) have introduced a framework based on three necessary components of IT governance:
structures, processes and relational mechanisms (Figure 2). Van Grembergen and De Haes (2009) define enterprise IT governance as “an integral part of enterprise governance [which] addresses the definition and implementation of processes, structures, and relational mechanisms in the organization that enable both business and IT people to execute their responsibilities in support of business/IT alignment and the creation of business value” (p.3). The elements of this framework are interrelated and cannot form the IT governance separately.

![IT governance framework](image)

**Figure 2. IT governance framework necessary element (Adapted from Van Grembergen and De Haes, 2008, p.25)**

**Structures**
In the IT governance framework of Van Grembergen and De Haes (2008), the structures consist of roles and responsibilities, IT organization structure, the Chief Information Officer (CIO), IT strategy committee and IT steering committee. The authors define the IT organization structure through the three main modes of centralized, decentralized and federal IT governance. In this framework, roles and responsibilities are defined based on the ITGI (2006) demarcation, which aims to cover all the five focus areas of IT governance. It is very important that all the roles and tasks are defined and expressed unambiguously concerning the involved people in IT. The structures include a very clear presentation of the responsibilities of the executive managers. In addition, the CIO needs to be aligned with the Chief Executive Officer (CEO) and be accepted on the executive board at the top level of management by the senior executives on this board.

**Processes**
The processes in the IT governance framework (Figure 1) are more involved with business/IT alignment as one of the focus areas in IT governance. Lederer and Sethi (1988) define strategic information systems planning (SISP) as “the process of deciding the objectives for organizational computing and identifying potential computer applications which the organization should implement” (Lederer and Sethi, 1988, p.1). There are
also some tools and frameworks used for processes, for example balanced score card (BSC), Val IT, service level agreement (SLA) and COBIT.

**Relational Mechanisms**

The mechanisms in the IT governance framework (Figure 2) are concerned with the understanding of the relational mechanisms between business and IT. The relational mechanisms consider two-way communication, shared knowledge, participation, and collaboration between business and IT departments. According to Reich and Benbasat (2000), “shared domain knowledge” is gained through the experience of IT executives in business and vice versa. This is an important issue in the understanding of business and IT from each side. Moreover “social capital”, which covers the relationships between employees at different levels, and organizational relationships and communications are important concepts embedded in the relational mechanisms of IT governance (Reich & Benbasat, 2000).

**2.1.3. IT Governance Focus Areas**

There are five focus areas for IT governance introduced by the IT Governance Institute (ITGI 2003): Strategic Alignment (SA), Resource Management (RM), Performance Measurement (PM), Value Delivery (VD) and Risk Management (RK). The five focus areas of IT governance are based on the stakeholders’ value. The first three (strategic alignment, resource management and performance measurement) are considered as drivers and the other two (value delivery and risk management) are outcomes.

Five focus areas of IT are shown in Figure 3. Most of the IT governance models, frameworks, standards and structures consider these five focus areas during implementation. ITGI (2003) defines each criterion as follows.

“IT strategic alignment: Ensures a linkage between business and IT plans; defines, maintains and validates IT value propositions and aligns IT and enterprise operations. The main concern relates to the connection of enterprise business and IT plans with operations.

IT value delivery: Is concerning the accomplishment of the value propositions over the delivery cycle; makes sure that IT delivers the promised profits to the strategy. The key concern is on optimizing costs and ascertaining the essential value of IT over the delivery cycle.

Risk management: Ensures risk awareness by senior officers in the organization, a clear transparency and understanding of the organization’s desire for significant risk and compliance requirements, and the embedding of risk management responsibilities in the organization. The key issue is embedding accountability to decrease important risks.
IT resource management: Ensures optimal investment and proper management of critical IT resources: applications, information, infrastructure and people. The main concern is optimizing knowledge and infrastructure. The IT resource management area overlies the other four areas.” (ITGI, 2003, p. 24-30)

Performance measurement: Tracks and monitors the implementation of strategies and projects. This also applies to the use of resources, performance of processes and delivery of services. One case is the use of the Balance Score Card (BSC) that transforms strategies to actions in order to attain objectives that are measurable beyond predictable accounting. Crucial topics relate to situation and monitoring strategies and services.

IT governance is a continuous cycle that can be entered at any point. Usually, firms start with strategic alignment, after which comes implementation and then delivering value from IT. The risks should be identified and addressed; the performance needs to be measured and the strategy should be monitored regularly. Finally all the lifecycle activities can occur only with appropriate IT resource management (ITGI, 2003). Additionally, ITGI (2003) declares that IT governance does not occur in isolation but is influenced by the environment in which it is taking place; this environment is at the same time influenced by factors such as “stakeholder values; the mission, vision and values of the enterprise; the community and company ethics and culture; applicable laws, regulations and policies and industry practices” (ITGI, 2003, p.21). This highlights the significant role of environmental factors such as culture in the focus areas of IT governance.
This is the foundation for performing this research on finding the specific impact of culture on the IT governance five focus areas.


ISO/IEC 38500:2008 standard of IT governance is developed by the International Standardization Organization (ISO) and the International Electro technical Commission (IEC) (ISO/IEC 2008) as a specialized system for worldwide standardization. There are different mechanisms, frameworks and standards for IT governance. For example, COBIT 5 which is a mechanism, separating IT governance from the general management. COBIT 5 defines management as the function of supporting strategies and strategic plans and “runs” and “monitors” business processes aligned with them. The strategic plans are set up by the top level decision makers (governance) (ISACA, 2012, p.31) and management is done by lower level managers. Wilkin and Chenhall (2010) also explain this difference by stating that “management has the task of managing the company, while the governance has the responsibility of overseeing the organization and setting future strategic plans for the enterprise” (Wilkin and Chenhall, 2010, p. 111). Organizational structures around management, governance and IT will be arranged in various ways depending on the specific organization and the settings it has internally and externally.

Previous research using the standard of ISO/IEC 38500:2008 is very rare according to Wilkin & Campbell (2010). So this research will be helpful in authentication of the ISO/IEC 38500:2008 standard. The ISO/IEC 38500:2008 is an instrument for top level management when it comes to IT governance in an organizations. According to Chaudhuri (2011) this standard is particularly used through the processes of “evaluating, directing and monitoring IT” (Chaudhuri, 2011, p.5). Its goal is to be applicable for different sorts of organizations, including governmental (public) and private organizations. This standard is proposed to foster the effective use of IT by directing top-level management (Chaudhuri, 2011). Wilkin and Campbell (2010) state that the ISO/IEC 38500:2008 has three important intentions: 1) Assure the employees, investors and other stakeholders that the organization is working according to the standard aiming to achieve a desired level of effectiveness in IT governance; 2) The standard specifies directions for top level managers regarding IT solutions and projects in the whole organization; and 3) The possibility of IT governance evaluation by the organization managers by using the standard.

There are six principles introduced by ISO/IEC 38500: 2008 for governance of information technology including: responsibility, strategy, acquisition, performance, conformance and human behavior. ISO/IEC 38500: 2008 states that thee principles should be evaluated, directed and monitored. The principles are defined bellow (ISO/IEC 38500: 2008, p.6):
“Responsibility
The understandings and acceptance from groups and individuals in an organization about their responsibilities. These responsibilities are both regarding supply and request for IT. The people with responsibility for actions also have the power to make those actions.

Strategy
The business strategy of the organization is regarding the current and future abilities of IT; IT strategic plans fulfill the current requirements of the organization’s business strategy.

Acquisition
IT acquisitions are made based on different motives based on suitable and ongoing analysis, with well defined and clear decision-making. For both current (short term) and future (long term) there should be a balance between benefits, opportunities, costs, and risks.

Performance
IT is required for supporting organization, service delivery with levels of service quality essential to meet current and future business requirements.

Conformance
IT fulfills all mandatory legislation and regulations. Policies and practices are clearly outlined, implemented and enforced.

Human Behavior
IT policies, practices and decisions establish respect for Human Behavior, including the current and upcoming needs of the people involved in process.

Table 1 summarizes the description of evaluation, direction and monitoring for each of the ISO/IEC 38500: 2008 principles.

Table 1. ISO/IEC 38500:2800 standard of IT governance principles and processes (Adapted from ISO/IEC 38500: 2008, pp.9–15)
As shown in Table 1, the processes need to be done for each principle. Six principles of ISO/IEC 38500:2008 are in the left column. These principles can be applied through three steps of evaluating, directing and monitoring, which are positioned at top row of Table 1.

2.1.5. IT Governance Performance

There are five focus areas of ITG defined by ITGI (2003): 1) Strategic Alignment, 2) Resource management, 3) Performance Measurement, 4) Value Delivery and 5) Risk Management. ITG is considered as a continuous life cycle and the organizations can enter to it at any point.

ITG performance measurement is one of the five focus areas. It tracks and monitors the implementation of strategies and projects and should be done regularly. Weill and Ross (2004) mentioned that “Governance performance assesses the effectiveness of IT in delivering four objectives weighted by their importance to the enterprise” that are: “1) Cost-effective use of IT, 2) Effective use of IT for asset utilization, 3) Effective use of IT for growth and 4) Effective use of IT for business flexibility” (Weill and Ross 2004, P.121).

1: Cost – effective use of IT is mostly engaged with how much IT has been beneficial for the business.
2: Effective use of IT for growth concern is how IT has been effective in learning, being innovative, gain competitive advantage and making improving changes.
3: Effective use of IT for asset utilization is focusing on how successful IT has been to use the knowledge based assets in an organization.
4: Effective use of IT for business flexibility investigates on how IT has been successful for the business to respond to the internal and external changes (ITGI 2003).

In order to use above objectives in an organization, first senior managers need to identify the importance of each of four objectives. The weight of importance can be through a 1-5 scale (1 for not important and 5 for very important). After that, the four objectives of, the organization success in ITG should be rated. Rating can be done through a 1-5 scale (1 for not successful and 5 for very successful). Finally a weighted average formula is used to calculate the overall ITG performance score with a maximum score of 100.

Overall IT Governance Performance Score is:

\[
\sum_{n=1}^{4} \text{(importance of outcome)} \times \text{influence of IT governance} \times 100 \\
\sum_{n=1}^{4} (5 \times \text{(importance of outcome)})
\]
According to this formula first the importance of each ITG performance outcome is rated (scale of 1-5), this rating may be different in different firms. Then the degree to which the firm is successful in reaching each of those outcomes is scored (scale of 1-5) and in the end the overall ITG performance is calculated. Weill and Ross (2004) used this formula for measuring the ITG performance in 256 companies in 23 countries. The average score was 69 out of 100, with minimum score of 20. One third of the companies scored over 74 and only seven percent scored over 90.

2.2. The Concept of Culture

The culture can be viewed from different perspectives and in different levels. There are also variant definitions of it among researchers and practitioners in various fields. Culture gets formed where there are some elements shared among a group. These elements can be shared experience, shared history, collective activities, common colleagues or managers and shared places. Schein (2010) describes culture as “a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems” (Schein, 2010, p.17).

Levels of Culture

Culture can be defined based on the level of the people groups in which culture exists and also based on the level in which the culture can be visible in each group. The people groups can be in national, organizational and sub-units levels. Researchers have defined various concepts and models for explaining culture at different levels. Hofstede (2001) introduces five dimensions for characterizing and measuring the national culture including power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance and long term orientation. A large research program called GLOBE (Global Leadership and Organizational Behavior Effectiveness) also introduces nine dimensions for national culture as future direction, uncertainty avoidance, performance focus, assertiveness, power distance, humane emphasis institutional collectivism, in-group collectivism, and gender equality (House et al., 2002). Robbins & Judge (2011) indicate that the organizational culture is associated with the value system distributed among the members of an organization. This value system holds the leading characteristics understood and accepted by a group of people and they behave based on those characteristics. This represents the characteristics that make one organization distinguishable from another. Jones (2007) also defines organizational culture by four fundamentals as follows:
characteristics of people within the organizations, organizational ethics, property right system; and organization structure. Jones (2007) argues that the four mentioned fundamentals interact with each other and all together shape the organizational culture of a firm.

In several large organizations there exist also subcultures. In such organizations, the leading culture characterizes the more significant and well-known values. Most of the employees in the organization are conscious about those values and have them in their minds. Subcultures in these organizations characterize the common understanding initiated in particular departments or local offices. Culture at the national level is on the other hand affecting the other two levels of culture and sometimes they are not so accurately defined. Hofstede et al. (1990) has concluded that organizational culture is affected by national culture to a specific degree in some cases. Therefore the culture exists in all levels of people groups and it can be even mixed in different groups. There are also different models introduced for culture in different levels.

2.2.1. National Culture

There are many different uses of the term culture such as shared forms, ideas, symbols, values, ideologies, rules and collective norms and patterns and of course culture is not unique in this way and many definitions and aspects of it exist (Alvesson, 2012). According to Hofstede (2001) the culture of a society called the national culture is defined as the shared values, understandings, assumptions and goals that exist in the current society and have been learnt from earlier generations. These shared values and assumptions are imposed by the present members and will be transferred to the succeeding generations. Each member of a national society is born into, not with a given culture. This culture gives directions to the way of living, communication, life and work standards and expectations of the person (Dressler & Willis, 1976). Fischer et al. (2009) in a more recent definition describes culture as patterns of characteristic behaviors displayed by most people as observed by members of that culture.

Rauch et al. (2013) indicates that different national cultural context can have relation with various issues even the degree of innovation and growth in the firms. According to Deresky (2011), it is a critical skill for managers of organizations to have an understanding of the national culture of the environment in which they are running their business. This cultural understanding of the behavior of individuals and groups within the organization brings an advantage for the organizations in competitive industries specially while operating globally.

Different researchers have developed various models and frameworks for studying and understanding national culture and it has been assessed through both values and practices (Stephan & Uhlander, 2010). Hofstede’s model is
one of the most famous models for characterizing and measuring the national culture. The first version of this model introduced four dimensions of national culture and later a fifth dimension was added (Hofstede, 2001). The five national culture dimensions are: power distance, individualism versus collectivism, masculinity versus femininity, uncertainty avoidance, and long term versus short term orientation (Hofstede, 2001).

The Global Leadership and Organizational Behavior Effectiveness (GLOBE project) also identifies cultural dimensions for distinguishing different societies (Javidan & House, 2001). The GLOBE research project was accomplished during following seven years of collecting data from a huge number of managers (18,000) in 62 countries involving 170 researchers. As the a result of the project, Javidan and House (2001) introduce nine national culture dimensions including: assertiveness, future orientation, performance orientation, human orientation, gender differentiation, uncertainty avoidance, power distance, institutional collectivism versus individualism and in group collectivism. Some of the GLOBE dimensions are in common with the Hofstede (2001) model dimensions (for instance power distance).

Considering the different models and dimensions of national culture of each country, there can be even some connections found among some of the countries. Gupta et al. (2002) used the GLOBE cultural dimensions to find the similarities of different national culture and introduced ten geographical clusters based on those similarities. It is claimed by the authors that the cultural clusters can be used by the multinational corporation managers to lower down the risks and increase the profits by choosing to work in countries in similar cultural cluster (Gupta et al. 2002).

2.2.2. Organizational Culture

Organizational culture has gained attention by numerous research with different focus areas such as the definition of organizational culture and its effects on success or failures of organizations. There is a high interest from the practitioners to organizational culture during the past decades (Alvesson, 2013). Finding and studying specifically defined factors in the organizations causing success or failures are relatively easier; for instance marketing bias, leadership mistakes and pride on success. On the other hand, the in the effort in finding the reason of those factors happening, the concept of culture needs to be considered as its own particular definition (Schein, 2010). Different researchers define organizational culture. The organizational culture can be described considering two aspects of practices and values or behavior and beliefs. Kostava (1999) defines organizational culture as methods that an organization behaves in a specific time era. The knowledge in every organization is defined by the practices in it. The values existing in every organization are also included in the organizational culture. The values in
contrast with the practices are invisible to the staff and occasionally can be derived from the practices. These values may have diverse levels of influence may exist from these values on the organizational culture. Cameron and Quinn (2011) have developed a strategy for measuring the organizational culture adapting both quantitative and qualitative approaches. They consider the quantitative approach for examining the underlying beliefs and values (culture) and qualitative approach for exploring the surface of the organization (climate). They propose the Organizational Culture Assessment Instrument (OCAI) a dimensional model of the organizational culture based on the Competing Values Framework previously introduced by Quinn and Rohrbaugh (1983). This framework is established on two dimensions of structure and focus of organization, specifying the degree of internal or external focus of the organization and the degree of the flexibility or stability of the organization structure. A model called “X Model of Organization Culture” developed by Smit et al. (2008) is among the newest models introduced for organizational culture. This model categorizes the organizational culture elements in five clusters named: leadership, strategy, adaptability, coordination and, relationship. Choo (2013) proposes a typology called “information culture” and counts it analogous with organizational culture. The information culture is similar to organizational culture but with a distinguishing focus on the cultural norms, values and behaviors regarding the way information is perceived, used and managed in an organization. According to Cooke and Rousseau (1988) there may be even subcultures within an organization related to the norms and values shared among subunits of an organization. These subunit cultures might be different based on the functions of sub units or other characteristics of them. The classifications and models used in organizational culture have also encompassed features connected with national culture. This is a result of globalization and wide-reaching use of IT, for example the model created by Hofstede (2001) and the studies accomplished under the research project GLOBE (House et al. 2002).

2.2.3. Organizational Culture Assessment Instrument (OCAI)

There are different models and frameworks introduced for identifying or measuring the OC dimensions (Cameron and Quinn 2011; Schein 2009; Hofstede 2001; Janssens et al. 1995-10. An instrument for diagnosing OC is developed by Cameron and Quinn (2011) called Organizational Culture Assessment Instrument (OCAI). Through OCAI, six key dimensions of organizational culture are considered to be evaluated:

1) “The dominant characteristics of the organization
2) The leadership style and approach that permeate the organization
3) The management of employees or the style that characterizes how employees are treated
4) The organizational glue or bonding mechanisms that hold the organization together
5) The strategic emphases that define what areas of emphasis drive the organization’s strategy
6) The criteria of success that determine how victory is defined and what gets rewarded and celebrated” (Cameron and Quinn 2011, p. 151)

OCAI is based on the Competing Values Framework previously introduced by Quinn and Rohrbaugh (1983) in which four groups of organizations are diagnosed. These four groups are specifying the core values through which the organization is recognized and judged. These core values are different through two main aspects: 1) Internal focus and integration versus External focus and differentiation and 2) Stability and control versus Flexibility and discretion. Figure 4 summarizes the dimensions of organizational culture and four cultural types introduced in OCAI model.

![Figure 4. Four organizational culture types and their characteristics based on the six dimensions introduced by OCAI model (Adapted from Cameron and Quinn, 2011, p.152)](image)
Four clusters of OC are named after their most notable characteristic, which are clan, adhocracy, market and hierarchy.

**The Clan Culture**
If an organization is profiled as a clan culture firm it means that they have a friendly environment and people share many things with each other. In such a cultural profile the organizations can be considered as a large family with the managers as the mentors or even parents. Loyalty is an important factor which leads to a high commitment. The human resources are long term beneficial. The main concern is on customers and the success of the organization is defined through how sensitive the organization is regarding its customers. Team work, participation have a high priority in a clan culture organization.

**The Adhocracy Culture**
In an adhocracy culture the emphasis is on being creative, entrepreneurial and dynamic. The organization is risk taking, leaders try innovative solutions and they want to be the premiums on their own business. Their aim is growth and leading in product or service they provide. The individuals have freedom for creativity as an important commitment.

**The Hierarchy Culture**
Hierarchy culture in an organization equals with having a high formalized and structured work environment in which there is a procedure for everything and everybody with specific tasks. Leaders are not risk taking or innovative and they are more efficiency minded instead. Stability is the long term aim and the performance just needs to be efficient with usual operations. Such organizations consider themselves efficient when they have the needed delivery of products or services, follow the formal rules on time and have a low cost and not on how creative people are.

**The Market Culture**
A market culture organization is a result- oriented one. The most important concern is getting the job done on time and competition is crucial in such organization. The leaders are drivers and compete a lot. Organizations are considered successful if they have a notable share in the market and there is a lot of need for their products or services. An important issue in a market culture organization is managing to have a competitive pricing as well as reputation.
2.2.4. Motivations to Use OCAI for this Research

According to Cameron and Quinn (2011), OCAI instrument uses the integration of many dimensions of OC. OCAI includes aspects both regarding the current state of the OC and the way the members believe it should be developed based on the business demands. Moreover, OCAI is a validated tool used by over 10000 companies worldwide (OCAI online, 2015); it examines OC and the desire for change in an organization through an integration of many dimensions. It can be used by consultants to help an organization make the constructive changes with new teams and leaders with new working methods (Suderman, 2012) [16]. The above argued reasons make OCAI an appropriate OC model to be used for the purpose of this research which is to find the influence of OC on ITG performance. Additionally in this research the focus is on ITG performance and the departments working on IT have a great potential of changing their team work methods. These changes need to be followed by changes in peoples’ behavior and culture as well and OCAI can be very useful in identifying and applying desired cultural changes.

2.3. Organizational Structure

According to Dow (1988) organizational structure defines patterns for actions and interactions between different roles and positions in an organization. These patterns can be stable and planned or spontaneous and unstable. This organization structure can be defined in general organization wide or can be defined for each department and unit separately to specify the way the employed perform their tasks. Furthermore the organization structure needs to purposeful and supporting organizations objectives. Organizational structure is a tool that can be defined by the managers for directing the activities and relationships among the organization members towards achieving the goals. “Based on the understanding of organizational culture and structure, a causality of their relationship, or rather their mutual influence, can be postulated as a reasonable presumption. It can also be assumed that the compatibility of organizational culture and structure would have a positive impact on an organization’s performance” (Janicijevic, 2013, p. 39). Information systems and IT governance should be reflected in the design of the organization’s (IT department’s) physical structure. Pearlson and Sounders (2013) also indicate that “ideally, an organization structure is designed to facilitate the communication and work processes necessary for accomplishing the organization’s goals”. Therefore, while studying the influence of organizational culture on IT governance, it is important to study the influence of organizational structure on IT governance as well.
2.3.1. Different Types of Organizational Structure

Organizations can choose different types of organizational structures based on their business objectives. Jones (2007) states that for an organization, the suitable structure is the one that makes the organization capable of effectively respond to the problems and changes of the environment, technology, market or human resources. The IT department can have their own specific organizational structure or the same structure as the general organization. Pearlson and Sounders (2013) state that the information systems at the organization need to support it in achieving the goals and must reflect the business strategy. They note that the information systems need to be coordinated with the business strategy and organizational strategy. The organizational structure they choose for their IT department should be in a way that supports those other two strategies. Different organizational structures reflect different organizational strategies they follow aligned with the business strategies to accomplish goals. Therefore it is very important for the IT department to design an organizational structure in a way that all the IS resources such as human resources, hardware, software and data are used perfectly. The following sections briefly introduce different organizational structures based on Perlsons and Sounders (2013).

**Hierarchical Organizational Structure**

The hierarchical organizational structure is based on the division of control, labor, expertise and unity of demand. Decisions are usually made top down and centralized. The process of work starts by ordering from the top level and the middle managers have the role primary information processing. The middle managers are the ones who communicate the tasks to their subordinates.

Jobs are usually divided according to the specifications and particular functions. The hierarchical organizational structures are most suited for those organizations that are relatively stable and are working in a certain environment in which the top managers are able to make decisions about every issue in the organization very quickly.

**Flat Organizational Structure**

The flat organizational structure is in contrast with the hierarchical organizational structure. In this type of structure there is less top down decision-making and command chain. Usually there is no specific organization chart; the relationships, job definitions and reporting systems are fluid. In the flat organizational structure everyone does whatever needed to complete a business task and is also eligible to make needed decisions about it. In flat structures it is possible to respond quicker to the changes in the market and dynamic unstable environment. In flat organizations there is more potential for innovation and flexibility but this is only possible with a strong teamwork. Teamwork is very important in flat organizations.
Decision-making is usually decentralized in flat organizations but when they grow and more individuals are added to the groups there will be some hierarchy also created.

**Matrix organizational structure**

Matrix organizational structure is the third popular organizational structure (Pearlson and Sounders, 2013). In matrix organizational structures, the workers are assigned to two or more supervisors. Each supervisor is specialized in one issue and directs a different aspect of the business. This way the organization makes sure they use their human resources in different projects. In this type of organization, the team members should report to both of their supervisors and both supervisors are responsible for the work development and performance of their team members. It is the team managers who make needed decisions. The matrix allows the organizations to focus on both function and purpose and the human resources are shared in a flexible way between different groups. The matrix organizational structure is appropriate for this organizations with complicated decision making process and unstable environments. There are also some drawbacks for matrix organizations such as confusions for employees regarding their task definitions and reporting to two managers and some of the problems may stay hidden in such system.

**Networked Organizational Structure**

This type of organizational structure is possible through advanced IT systems today. The decision rights are highly decentralized in these organizations. The controls are based on information systems sharing and communication systems. The networked structures are aiming for high creativity and flexibility using information systems and keep control on operational processes at the same time.

In networked organizational structure there is the possibility for all the employees to share knowledge and experience. Decision-making can be performed very fast since the needed data for decision-making is shared, stored and analyzed instantly.

2.4. **The Importance of Culture and Organizational Structure in IT Governance Research**

The research literature has indicated that the most effective organizations have the most strong and positive culture. Schein (2010) mentioned some experiences in the globally working companies that use culture for providing an environment for the employees and managers in situations such as the changing from de-centralized to centralized organization or in aiming to reach higher innovation or become more flexible in respond to the changes
in the business. In all of these cases culture was an important factor. In a study by Pereira and da Silva (2012), the authors aim to find the determinant factors that can influence IT governance implementation. The authors extract nine factors from literature that include organizational culture and structures well. After evaluation of their theory, Pereira and da Silva (2012) indicate that among those nine factors, culture, structure, industry and maturity of the organization are the most relevant factors in IT governance implementation. The authors believe that these factors are not present in any IT governance framework and they should be considered by the managers before implementing IT governance. Furthermore, Leidner and Kayworth (2006) claim that culture in all levels can influence the people and the organizations, and can play a role in sharing information, communication and sharing the experience to prevent repeating the fatal mistakes. The cultural issues were even noticed in a new study by De Haes et al. (2013) on COBIT 5. In this research they go through the major directions of COBIT 5 and mention to “enabling a holistic approach” (De Haes et al., 2013, p.316) as one of these directions for governing IT. They emphasize that in order to get such an approach; it is needed to consider the organizational systems and people relationships and culture. In a research by El-Mekawy et al. (2012), the impact of culture in IT management is emphasized by focusing on how the cultural factors can be considered to advance business and IT alignment maturity level. In their research the authors use the organizational culture elements introduced by Smit et al. (2008) to extend the strategic alignment model of Luftman (2004) to evaluate their extended model. The significant result from the evaluation of El-Mekawy et al. (2012) is that organizational culture has an influence on business and IT alignment maturity. The authors’ state in the end that the organizational culture affects the way the business and IT are comprehended and the managers can improve the level of business and IT by considering the organizational culture. It is also stated by Maidin and Arshad (2010) that ethics or culture of compliance is an important factor of IT governance practices. Finally in a recent study Rowlands et al. (2015) suggest a framework based on the dimensions of the culture relations with IT governance implementation with a focus on COBIT5 standard of IT governance.

Additionally Janičijević (2013) states that organizational structure and culture are among those concepts that have very important explanatory and influencing roles in understanding the causes of many different issues regarding people’s behaviors in organizations. Jones (2007) also defines organizational culture by means of four fundamental features: the characteristics of people within the organizations; organizational ethics; property rights system; and organization structure. Jones (2007) argues that the four mentioned fundamentals interact with one another and together shape the organizational culture of a firm.
According to Janićijević (2013), the two concepts of organizational culture and structure are used as variables in the research for explaining various phenomena in organizations. However, there is a lack of research on understanding the influence of organizational culture and structure on IT governance.

Wilkin and Chenhall (2010) note that organizational structures formed around IT project management and IT governance, will vary dependent on the certain organization and its internal and external circumstances. Therefore it is important to identify the influence of organization structure and the way it should support the IT governance implementation in each company. Therefore we argue that organizational culture and structure can influence IT governance in organizations and there is a need for an investigation to ascertain how this is done.
3. Research Methodology

In this chapter the research methodology, research process, data collection, data analysis and the validity and reliability of the research are described. The main research methods used in this thesis are a literature review and case study research.

Research Process

This thesis consists of two phases, the literature review and the case study. Since the topic has been under consideration only recently, there was no literature review existing on the role of culture on IT governance and it was necessary to conduct a literature review to identify the previous research and the gaps. After that, it could be decided how to contribute to the existing research. To accomplish this aim, almost the same amount of time and effort has been used for both of the phases. Two case studies have been performed for this research, one studying the role of organizational structure while implementing IT governance practices, and the other studying the role of organizational culture in IT governance performance. For each of the case studies, specific models and conceptual frameworks were used. These are introduced in the extended background chapter. Table 2 represents the research process of this thesis and the activities carried out in different phases. The results, goal, addressed question, method, data collection technique and data analysis approach in each of the three research activities are described. The arrows in the table show the links between different activities and how the results of one have directed the goal setting for another.
Research Scope

Before describing the different activities of this research, it is also important to note that this research is in the information systems (IS) field and the scope of this research is defined based on the contributions it can bring to IS research. The interest of this research is to find the influence of organizational culture and structure on IT governance, and that is the direction though which the goal of the research is defined and the analysis is performed. There might be an influence from IT governance on the organizational culture and structure of the firm too; however, that is beyond the scope of this research and needs expert investigation from the cultural and social fields. Additionally, in the empirical part of this research we focus on the organizational level of culture and not the national level.
3.1. Research Activity 1: Literature Review

The approach for performing the literature review is concept centric in that the lens for organizing the literature is based on the concepts introduced in papers (Webster & Watson, 2002). In order to find the review literature in this research and conduct the review, we have followed the steps defined by Creswell (2011, p.76), which include the following.

1. Identify the key terms to use in the research.
2. Locate literature about a topic by consulting several types of material and databases.
3. Critically evaluate and select the literature for review.
4. Organize the selected literature.
5. Write a literature review that reports summaries of the literature.

3.1.1. Application of the Literature Review

Search Strategy

The keywords used for searching were culture, organizational culture, IT governance, IT governance frameworks, and corporate governance in different orders and combinations (using “AND”). The first examined sources for articles were the leading journal publications and conference proceedings in information systems area (for example MISQ, JMIS, ISJ, EJIS, JSIS, JIT, ICIS, HICSS, AMCIS and ECIS). Then different databases were used, including Business Source Premier, Science Direct, AIS and the ACM Digital Library. To search for articles among these databases, the defined keywords were used. The databases, journals and conferences selected from the search sources led to careful extraction of relevant articles in the field and their references in order to prevent losing the direction of the search. All searches were done in English language. A manual review by the authors was also conducted to check the relevancy of the results.

Inclusion and Exclusion Criteria

From a pool of 220 articles found from the databases, duplications were deleted; after that, the relevant literature was selected. According to Creswell (2011), the relevance of the articles can be inspected through different dimensions, such as topic, problem and question, accessibility and finally individual and site relevance. Based on the searched terms and concepts, we examined the topics, abstracts and conclusions of the articles and a review of the whole article was carried out with those remaining. The inclusion criteria of the articles included those which were investigating both IT governance and culture. This strategy was used in order to prevent an unmanageable quantity of literature with low relevance to the topic. Figure 5 shows the process steps of selecting the articles from research literature in this research.
Finally, only eight articles were selected from research literature on culture and IT governance. The articles are not confined to a specific geographical region and they are not limited to a specific study sample (for instance, a specific industry or organization). The common point between all of articles is the existence of the culture concept and the fact that they are focused on one or more component of IT governance.

3.2. Research Activities 2 and 3: Case Study Research

Yin (2013) defines the case study research method as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 2013, p.23). This research method aims to understand the dynamics existing in single settings.

According to Yin (2013), case study is a method suitable to be used in situations when the research has questions about “how” or “why” and when we have no control over the studied situation. Case studies can implicate either single or multiple cases and use various levels of analysis (Yin, 2013).

Typically, the case studies accommodate different methods of data collection for instance; a mixture of questions, interviews, archives, surveys and observations may be used in one single study. The evidence may be qualitative (e.g., voice or records, words and figures), quantitative (e.g., numbers and diagrams) or a combination of both qualitative and quantitative data (Eisenhardt & Graebner, 2007; Myers, 2009).

Case study research is an appropriate choice in an organizational context where the authors’ creativity should be used to interpret the existing
environmental issues to understand complex processes and events (Benbasat et al., 1987; Myers, 2009).

This research is specifically investigating how organizational culture can influence IT governance performance in firms and how the organizational structure forms around the IT governance implementation. Myers (2009) indicates that case study research has been identified as a suitable research method for IS research, specifically when the goal is to find out about the influence of organizational and social issues on IS. A qualitative approach is used in this research, since a qualitative study is more likely to obtain unexpected information than the quantitative approach, which is more structured and detailed from the beginning (Myers, 2009). Thematic and analysis method is used for analyzing the data for case studies. In thematic analysis, the aim is to look for patterns and identify, analyze and report them based on the theoretical part of the research (Braun & Clarke, 2006). Through the thematic analysis, the researcher used the collected data to find themes, codes, patterns, groups and categories which could be analyzed based on the conceptual approach of the research, on which analysis of the findings is also based.

The use of case studies and qualitative analysis of data in the prior studies that have explored IT governance (for instance, Cormack et al., 2001; Janssen et al., 2013; Satidularn et al., 2012; Wilkin & Campbell, 2010; Willson & Pollard, 2009; Zhong et al., 2012) provides credence for selecting this method to address this research question.

3.2.1. Application of the Case Study

In this section, the application of the case study method is explained in two different studies, each focusing on one of the research questions of this thesis (research questions 2 and 3).

Case study 1

In the first study, we concentrated on the organizational structure while implementing IT governance practices. The case study was conducted in spring 2013 in a large construction company (anonymously called Company A) working globally and headquartered in Sweden. This company is performing a large variety of projects varying from the infrastructure to building and land to land bridge constructions. The enterprise has 18,000 employees and has a revenue of roughly six billion euros.

The ITP project is an IT governance project which is part of a larger development project started in 2008, when Company A defined a new set of strategic objectives for 2012. The aim of the ITP project is to have an effective process line for production resulting in a reduced cost of production. To achieve this target, the customers end value has been
increased by the company and this is done through a maximum use of the resources. At the same time, the company improved the products’ qualities. Through the application of these changes, the organization reached a more competitive position in the market.

The IT governance practices applied in this specific project are studied through the lens of ISO/IEC 38500:2008 to discover how they are related to the principles of this standard and the organizational structure around it.

The data were collected through semi-structured interviews with various IT managers involved in the ITP project, as well as IT managers outside the project who were affected by this project and needed to make changes in their work processes because of the application of the ITP project. The semi-structured interview questions let the respondents talk freely about their experiences (Runeson et al., 2012. The six interviews took almost one hour each; they were recorded and transcribed for analysis. Internal documents of Company A regarding the ITP project were also provided by the interviewees as a complementary source for triangulation and analysis.

The recorded interviews have been analyzed qualitatively with the help of the predetermined codes and thematic analysis that was done through identifying, analyzing and reporting patterns (Braun & Clarke, 2006). The internal documents of the ITP project were also used to perform triangulation for the analysis and find the organizational structure around the ITP project implementation. However, the internal documents are not attached to this thesis in accordance with confidentiality issues. The data are analyzed in relation to the ISO/IEC 38500:2008 matrix and evidence of IT governance practices and then logged into a matrix. The matrix has also enabled us to note where some IT governance practices are missing.

Case study 2

In the second study, the focus was on the role of organizational culture in IT governance performance. We employed a case study of the IT department of a single construction company. The studied case is the IT department of a large construction company headquartered in Sweden, anonymously called ITS in this research. ITS has 220 employees providing most of the IT services for the whole company.

Data collection was done through seven in-depth semi-structured interviews with IT managers of ITS during fall 2014. The interviewees included the CIO, vice president of service management, business liaison manager, enterprise architect, IT supplier manager and senior and middle managers of different functional units of ITS. In addition to the seven face-to-face interviews that took around 90 minutes each, the interviewees were asked to provide scores for each of the OC and ITG performance measurement dimensions.

The collected data from interviews were transcribed and then analyzed qualitatively by looking for themes, clusters and patterns. The relations
between these themes and patterns were also found in order to analyze the data aligned with the research conceptual framework. NVivo 10 software for qualitative data analysis was also used to create codes and help to find the themes from the transcribed interviews. This research aims to uncover the opinions and perceptions of participants with respect to the influence of the OC on ITG performance. To enhance the validity and reliability of the research, triangulation was done between interviews, secondary data and the literature review (Myers, 2009; Runeson et al., 2012). Using triangulation, interview transcripts were crosschecked and compared with ITS documents for the analysis. ITS also provided its internal data, which included its scorecard, strategic map and results from its OC assessment using OCAI for the whole IT department, to be used in this research.

Table 3 represents the information about the data collection for both case studies.

Table 3. Data collection and interview information of the two case studies

<table>
<thead>
<tr>
<th>Interviews</th>
<th>Number</th>
<th>Interviewee positions</th>
<th>Time and location of interviews</th>
<th>Total interviews duration</th>
</tr>
</thead>
</table>
| Case Study 1 | 6      | - Head of IT project development  
- Head of IT project implementation  
- IT Project leader  
- IT project development manager | Spring 2013 - Stockholm | 360 minutes |
| Case Study 2 | 7      | - CIO  
- VP of service management  
- Service & project management manager  
- Business liaison  
- IT architect  
- IT supplier & risk manager  
- IT maintenance manager | Aurora 2014 - Stockholm | 560 minutes |

For each case study, the data collection was performed using semi-structured interviews. The number of interviewees and their positions were carefully selected according to the research requirements. The questions used in the interviews are also attached in Appendices A and B.
3.3. Validity and Reliability of the Research

The quality of any research work can be judged by specific logical tests. Yin (2013) states that there are four tests commonly used for evaluating the quality of empirical social research. Case studies are one such form of research; therefore these four tests can be applied for testing the quality of the case studies. These four tests are construct validity, internal validity, external validity and reliability. Construct validity deals with developing correct sets of measures for the concept that is being studied. Internal validity deals with a causal relationship where certain conditions can cause other conditions. External validity is mostly about the generalizability of a study, and finally reliability demonstrates whether the study can be repeated in terms of data collection and get the same results.

It is necessary to consider both reliability and validity while doing qualitative research as they cover the whole research process. In this research, validity was ensured through the correct selection of models of organizational structure, culture and IT governance to form the design of the research work. Additionally, different kinds of data were selected for this research that provide a variety of evidence to be used in the qualitative analysis. According to Yin (2013), the findings from a single case study can be generalized to some extent. In this research, according to the findings of one of the cases, organizational structure is designed based on IT governance practices, while in the other case, it was concluded that the type of organizational culture influences IT governance performance. If other case studies are performed, the results may be similar but the details will be specific according to the case and the organizational situation.

The triangulation concept is a significant element in this research. Triangulation suggests studying a specific focus subject from numerous viewpoints (Runeson et al., 2012). To increase the validity of this research and its data collection collected data, several managers were selected for interviews. These managers were in the companies in different IT and business positions related to the area of research. These data were used together with the internal documents provided by the companies to gain a more holistic and balanced view of the cases.

Regarding the reliability of the research that aims to minimize errors, Yin (2013) suggests using case study protocol and a case study database. As mentioned before, the interviews with IT managers and relevant managers at the companies together with internal documents were used for data collection. The interviews were recorded and transcribed and the questions used at the interviews are attached in Appendices A and B, and can be used for repeating the study. The results from the NVivo 10 software for qualitative data analysis was used in the second case study as a complementary analysis tool are also presented in the results section. The software produces the same results with the same input data.
3.4. Ethical Considerations

Ethical considerations in this research are mainly regarding the confidentiality of the information provided by the companies through which the two case studies were conducted. There was an agreement between the researcher and the interviewees before starting the research that the data provided by the interviewees may be used only by the author. The results of the data analysis will be published but without mentioning any names and the author is the only person with access to the interview files and internal documents of the companies. The respondents also had the option to remain anonymous and, as is mentioned earlier in this thesis, the companies are labeled anonymously. The interviewees’ positions are included, but without any names.
4. Organizational Culture and Structure in IT Governance

In this chapter, the results and analysis of the data are presented. Based on the three research questions of this study, this chapter includes the results from the literature survey on the role of culture in IT governance, the organizational structure supporting the implementation of IT governance practices, and the influence of organizational culture type on IT governance performance.

4.1 Literature Survey on the Role of Culture on IT Governance (Research Question 1)

In order to answer the first research question a literature review was done to find all the previous empirical research on the role of culture on IT governance. Two different perspectives were used to search and categorize the literature; the first is the research perspective using the IT Governance framework of structures, process and relational mechanisms introduced by Van Grembergen and De Haes (2008) and the second is the practical perspective through which the literature are categorized using five focus areas of IT governance introduced by ITGI (2003). Considering these two perspectives most of the issues of IT governance are covered and the literature regarding the role of culture on them are found. More importantly the gaps and future work in each area regarding the role of culture in IT governance are found.

4.1.1 Literature Survey on the Role of Culture on IT Governance Structures, Processes and Relational Mechanisms (Research Perspective)

The findings from the literature revealing the influence of culture on IT governance are categorized using the IT governance framework consisting of structures, processes and relational mechanisms introduced by Van Grembergen and De Haes (2008). This is done by looking for relevancy between what the literature suggest that the culture has affected the
components of the IT governance framework and matching it with one of these components. Figure 3 presents the reviewed papers and which components of the IT governance framework they studied with a cultural influence perspective. Some of the research papers point to the role of culture in more than only one component of the IT governance framework. The number of the papers investigating on each of the components of IT governance framework is shown in figure 6.

As it is represented in figure 6, the reviewed papers are categorized based on the parts of the framework they cover and the numbers in circles in each component square, represent the number of papers covered that part of IT governance in terms of cultural influences.

4.1.1.1 Culture Influence on IT Governance Structures

Zhong et al. (2012a) indicates that in Chinese culture the people respect the individuals more than the law, therefore the decision-making is very centralized and some individuals can influence the decisions and steering committees job. This can facilitate the acceptance of the roles and responsibilities assigned to each IT employee. The accurate timing is mentioned as a cultural issue which is counted as more serious in Western culture. They also have the culture of “individualism collectivism” in which the shared goals and values of an individual are based on his/her inner social group (Zhong et al., 2012a). Through this culture, employees see the
power more on the person than the roles and structures. The culture through which the employees are resistance to sudden changes and accepting new technologies makes them slow and not successful in using standardized methods of monitoring and controlling. Janssen et al. (2013) have studied IT governance in “semi-state companies” (companies that are mostly or fully owned by the state) in Latin America. From their study it was observed that they had “closed culture”. The closed culture is defines as the culture of having slow and bureaucratic decision making structures (Janssen et al., 2013). In such organizations, they also report to be complicated structures with the missing role of business unit in the IT governance models.

4.1.1.2 Culture Influence on IT Governance Processes
In the study by Zhong et al. (2012a), they claim that the hierarchical culture in China helps to integrate and apply the IT related processes. The authors do not recommend the hybrid decision making structure since they believe it is not aligned with the hierarchical social norms. In Chinese culture people are not so careful about certain roles and planned models which affect negatively how they perform the IT governance process models. It has also cultural roots that there is not distinguished systematic way of data collection, documentation and structural data analysis. This causes them to have a hard and time consuming job for monitoring, modifying or decision making based on the processes done. The individualism collectivism culture in China also affects the formal processes and the group works. The Chinese are also resistance to sudden changes and this decreases the degree to which they can accept new formal standards and documentation processes (Zhong et al., 2012a). Janssen et al. (2013) claim that the organizations with the culture of focusing on results and collectivism and also less regulated are willing to have simple decision making processes. These organizations also are likely to have more participation from business in IT and achieve a stronger alignment of these two with each other. A study done by Nugroho and Surendro (2011) shows that in the company they studied, the organizational culture is affecting the IT governance and especially the delivery and support domain of the COBIT 4.1. According to the authors, the main existing form of organizational culture in the under studied firm is the clan culture which they define as “a friendly workplace where people share between them, like a family” (Nugroho & Surendro, 2011, p.4). The clan culture is one of the associated characteristics of organizational culture introduced in Cameron and Quinn’s (2011) model where the organizations focus is inward oriented and its structure is flexible. In this organization with such clan culture, the leaders act as parents. Also loyalty, team work, long term benefit and commitment are the strongest values. Based on this study, the commitment of the leaders, clear definition of the mission, vision and strategies by them and the culture of loyalty to the upper level managers support the organization for IT governance and data management.
In an explorative study between Belgium and Netherlands, Silvius et al. (2009) also indicate the cultural influence on IT governance. The authors analyze the Hofstede’s national culture dimensions influence on components of business and IT alignment maturity model of Luftman (2004). It is expected by the authors that in countries with lower power distance there is less need for formalized governance processes. Based on their empirical exploration, Silvius et al. (2009) conclude that the country with higher power distance (in this case Belgium is higher than Netherlands) have a higher score in IT governance maturity. Specifically the portfolio management process was scored higher in Belgium which has also a higher power distance than Netherlands. In addition their research confirms that the countries with a culture of having high degree of uncertainty avoidance have a higher level of governance maturity. The reason is the tendency to have more certainty which roots in the culture of that country. Finally, Satidularn et al. (2011) consider the national culture and have mentioned that the employees in a Thai organization they studied are very resistant to change. This influences the way the employees pay attention to best practices and follow the planned processes of IT governance.

4.1.1.3 Culture Influence on IT Governance Relational Mechanisms

The influence of culture on relational mechanisms can be firstly discussed with regard to the influence of national culture capabilities on the firm specific capabilities. According to Zhong et al. (2012b) the national culture dimensions are involved in different levels of social coordination. It is also important that for a specific firm, in which country the integration mechanisms are developed and in which country they are deployed. The formalized methodologies may not be effective because of the unpredictability resulted from environment dynamics. In the cultures with low uncertainty avoidance defined by Hofstede (2001) there are more problems in using the formalized and structured mechanisms.

In Chinese culture the information is considered as a confidential and personal benefit (Zhong et al., 2012a), so it is not shared eagerly. The dialogue, communication and participation are reduced among the stakeholders because of this cultural issue and this fact hinders the relational capabilities and makes them less functional. The Chinese culture is communicating based both on context and content. This makes their relation with stakeholders more clear, flexible and longtime lasting. Based on Zhong et al. (2012a) the “individualism collectivism” culture in China may have both positive and negative impact on relational mechanisms based on inner circles and group members the employees are located in. Zhong et al. (2012a) also define the “harmony maintenance culture” in China as the people tendency to respect the status and stay passive in sudden changes. They believe that this culture inspires the people to have more negotiation and in this way it has a positive effect on their relational capabilities.
According to Janssen et al. (2013), the individualistic culture instead of appreciating the team work in some organizations, affects the relational mechanisms in IT governance. Based on this culture the IT people do not tend to share ideas and interact with each other and this also makes the decision making difficult for the firm.

According to Ali et al. (2009), the IT leaders’ awareness of ethics and culture of compliance is critically affecting the employees and the organizational culture. They conclude that this has a positive effect on the IT governance of the companies. As the second factor affecting the mechanisms, they remark the corporate communication systems and its influence on the ethics in IT. The authors indicate that the culture of compliance encourages the employees to report violation which helps the decision making and also they get more committed to the company that increases their loyalty. Willson and Pollard (2009) use the term “organizational nature” including key characteristics of organization, attractive employer and store culture (referring to culture of people working in a specific unit) instead of “organizational culture” in their study. They believe in this way a broader context is covered related to the organization they have studied. The organization nature in this case creates positive environment and employee’s loyalty and perception of the company as a good employer and it facilitates the IT governance relational mechanisms. It is also mentioned that the diverse geographical structure of the projects, difficulties in collaboration among employees in different teams and low communication between them as the key characteristics of the organization, which influence the relational mechanisms (Willson & Pollard, 2009). In the research by Satidularn et al. (2011) it is revealed that in the organization they studied, there was less power distance and there were more common values among the employees due to their “brotherhood” management style that is rooted in their culture. This cultural status “facilitates the ITG communication between subordinates” (Satidularn et al., 2011, p.11) that is part of the relational mechanisms of IT governance.

Table 4 highlights the key issues found from each paper regarding the influence of culture on IT governance.
Table 4. Literature overview of culture influence on IT governance

<table>
<thead>
<tr>
<th>Author</th>
<th>Culture level/focus, model or instrument used</th>
<th>Research focus on ITG</th>
<th>Culture influence on ITG framework components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ali et al. [34]</td>
<td>Organizational culture/ Ethic or culture of compliance</td>
<td>IT strategy committee, IT steering committee, corporate communication systems &amp; top management involvement in IT</td>
<td>Structures: N/A</td>
</tr>
<tr>
<td>Wilhson &amp; Pollard [6]</td>
<td>Organizational culture/ Key characteristics, attractive employer and store culture</td>
<td>Six facets of ITG; also elements of ITG including structures, processes and control</td>
<td>Structures: N/A</td>
</tr>
<tr>
<td>Nagahbo et al [32]</td>
<td>Organizational culture/ OCAI</td>
<td>COBIT 4.1</td>
<td>Structures: N/A</td>
</tr>
<tr>
<td>Sathishnair et al [17]</td>
<td>Organizational culture/ Hofstede model (1995)</td>
<td>IT governance effectiveness in terms of structures, processes and relational mechanisms</td>
<td>Structures: N/A</td>
</tr>
<tr>
<td>Author</td>
<td>Culture level/focus, model or instrument used</td>
<td>Research focus on ITG</td>
<td>Culture influence on ITG framework components</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Relational mechanisms</td>
</tr>
<tr>
<td></td>
<td>National culture/ Hofstede model (2001)</td>
<td>IT governance capabilities including structural, process and relational capabilities</td>
<td>-National culture phenomena of respecting individuals more than law and structures influences the decisions and steering committee job.</td>
</tr>
<tr>
<td>Zhong et al [33]</td>
<td></td>
<td></td>
<td>-The culture of not being serious for accurate timing influences the responsibilities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individualism collectivism culture influences the roles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Staff resistance to change and new technologies makes them slow in using new monitoring and controlling systems.</td>
</tr>
<tr>
<td></td>
<td>Organizational culture/ Hofstede model (2001)</td>
<td>IT governance structures, processes and relational mechanisms</td>
<td>Semi-state organizations having closed culture influence the decision making structures.</td>
</tr>
</tbody>
</table>
As it is shown in Table 4 the selected empirical papers for review are the ones focusing on the role of culture as their main question. They are seven papers and are published between 2009 and 2013. This provides evidence that this topic is very new and there are not so many research papers in it.

4.1.2 Literature Survey on the IT Governance Five Focus Areas (Practical Perspective)

The following sections include the findings from the reviewed papers on the role of culture on IT governance. The findings are categorized based on the practical perspective this time using the five focus areas of IT governance introduced by ITGI (2003) including 1) IT value delivery, 2) IT resource management, 3) Strategic alignment, 4) IT risk management and 5) Performance measurement.

This processes resulted in a sample of 14 articles that were reviewed to determine their methodological approach, type of culture and levels (national, organizational or subunit), area of IT governance, and key findings. Figure 7 illustrates the use of the five focus area of IT governance according to ITGI (2003) to seek evidence of cultural impacts on IT governance in the research literature.

![Figure 7](image)

Since there were no papers found with a focus on the influence of culture on IT risk management as a main research question, the sections bellow are including only the other four areas as follows:
1) The influence of culture on IT value delivery
2) The influence of culture on IT resource management
3) The influence of culture on strategic alignment
4) The influence of culture on performance measurement
4.1.2.1 The Influence of Culture on IT Value Delivery

The value delivery focus area of IT governance is dealing with the benefits from IT through the business strategy and considers issues such as the costs of IT in the IT project cycles and how IT can provide solutions to reduce the costs and create more income for the business. Four studies were found mentioning the role of culture in this focus area of IT governance; two with a national culture and two with an organizational culture point of view. Zhong et al. (2012) use the terms IT governance performance and IT value delivery in an exchanging way and discuss about both value delivery and performance measurement of IT in their paper. They indicate that ITG represents a combination of IT resources and complementary organizational resources such as human resources and their cultures, which makes the firm capable of IT value creation. According to them the macro environment has a very important role in IT value delivery of the firm. They propose that national culture provides the complex structural, functional and social coordination through which the degree of IT value delivery is moderated.

Nugruhu and Surendo (2011) use the OCAI model of organizational culture introduced by Cameron and Quinn (2011) approach and COBIT framework for IT governance in case study. The authors indicate that the clan organizational culture in their studied case is the key to effective IT governance polices implementation, especially in the data management. The clan organizational culture brings more commitment of leadership and makes the organization to focus more on loyalty of the employees, friendly workplace and teamwork. According to the results from their studied case, the organizational culture is influential in in designing IT governance and creating value from IT. Another study with an organizational culture perspective done by Satidularn et al. (2011) emphasizes the role of organizational culture on the way IT governance practices and structures are designed. They conclude that strong organizational culture with a high degree of integrity, responsibility, accountability and ethical behavior (with refer to the Hofstede et al. (1990) organizational culture dimensions) leads the studied firm to view and pay attention to IT governance. The culture of brotherhood style management, minimal power distance and emphasis on integrity was influencing the IT value delivery aspect of IT governance. Finally in a recent study by Prinz (2015) the role of national culture on IT governance is studied in which the authors focus on COBIT framework and propose that the national culture concepts of worker participation, supervision, and feedback and rewards system have and influence on IT governance value delivery.
4.1.2.2 The Influence of Culture on IT Resource Management

IT resource management is the second focus area of IT governance and it deals with the management and investment on the IT resources including people, applications, hardware and data. In this focus area of ITG it is very important to gain an optimal management of knowledge produced in the firm and the use of infrastructure. Among the reviewed literature, three of them were touching this focus area of IT governance regarding the role of culture in it. One of them takes an organizational culture perspective and the other two take national culture perspective. According to Janssen et al. (2013) an organization with a cultural focus on results and collectivism (from Hofstede et al. (1990) organizational culture dimensions) tends to implement more simples structures of IT governance and simple decision making processes and they get a greater degree in using their IT resources and integrate their knowledge. The authors claim that the organizations with the culture of individualism where the company values individual work, there is less team work, the structures are more complex and the decision making will be more difficult, slow and bureaucratic. This type of culture causes less participation of business executives in IT governance model, less interaction between areas and different resources and therefore less optimized IT resource management. The national culture influence on IT governance was studied by Prinz (2015) using Hofstede et al. (1990) dimensions to draw the cultural concepts in Japan and Germany. The authors used COBIT key areas and found that the factors of worker participation, supervision, feedback, rewards, formalization and rules have an impact on the IT governance resource planning. Zhong et al. (2012) also take a resource-based view thorough that they conceptualize IT governance as a set of firms resources and discuss the IT governance integration under the national culture influences. According to them a combination of structural, functional, social capabilities and moderation of culture fit leads to improvements in firms specific IT resources.

4.1.2.3 The Influence of Culture on Strategic Alignment

The strategic alignment focus area of IT governance aims to ensure that the IT and business plans are linked with each other, both sides understand each other and business and IT operations are aligned. The reviewed literature provided the results that seven papers had an emphasis on the role of culture on strategic alignment area of IT governance. Among these seven studies, two of them had a national culture perspective and the rest had an organizational culture perspective. El- Mekawy and Rusu. (2011) and Slivious et al. (2010) use the X model of organizational culture from Smit et al. (2000) to find the impacts of organizational culture on business IT
alignment maturity in a model introduced by Luftman (2004). According to El-Mekawy et al. (2012), there are inputs from the human behavior and organizational culture to the issues such as: understanding of IT by business, understanding of business by IT, relationships and cross training which are aspects of strategic alignment. Slivious et al. (2010) additionally stress that three dimensions of organizational culture called strategy, coordination and leadership were found having a strong relationship with governance on the business IT alignment maturity.

In another study Erasmus et al. (2012) found that aspects of organizational culture in particular the ones including innovation, risk taking, team orientation and change readiness impacted the strategic alignment components. These aspects of organizational culture can be used to encourage more collaborative IT decision-making and improve the alignment maturity. Al majali and Dahlin (2010) also stress the culture gap concept existing between IT and business strategy which is the issue of strategic alignment in IT governance. They indicate that the factors of leadership, processes, service quality, structure, values and beliefs are representing the culture gap between IT and business strategy and affect the strategic alignment. Finally Cormack et al. (2001) highlights that cultural characteristics of IT group are associated with the tension in the relationship between the business and IT side. Among these cultural characteristics the authors remark the indirect way of reporting to the CEO from the IT managers, poor communication, and decentralized structure of IT department and system delivery processes. The authors conclude that mutual benefits and organizational linkage are lacking in the business and IT partnership due to the organizational culture of IT group. The role of national culture in strategic alignment has received attention in two studies done by El Mekawy and Rusu (2011) and Silvious et al. (2009). Both studies remark the influence of culture on business IT alignment components. Slivious et al. (2009) clearly states that the difference in cultural dimensions introduced by Hofstede et al. (1990) can affect the governance maturity and skills in business IT alignment.

4.1.2.4 The Influence of Culture on Performance Measurement

Performance measurement focus area of IT governance is related to tracking and monitoring the strategies, processes and services to find out their performance and goal achieving. Among the papers reviewed there are five of them that point out the role of culture in performance measurement of IT governance. Four of the studies had an organizational culture perspective and one had a national culture perspective. Gu et al. (2014) in a recent study concludes that the organizational culture has a relationship with IT
performance. The authors use the four dimensions for organizational culture including results orientation, institutional collectivism, positive work environment and leadership risk tolerance adapted from Naor et al. (2010). They provide evidence that the organizational culture affects the IT project performance in many aspects such as meeting the expectations, team members satisfaction, benefits to the organization and improving the competitive position. Nugruhu and Surendo (2011), Satidularn et al. (2011) and Xiao and Dasgupta (2005) in separate studies are also claiming that the organizational culture has an effect on IT governance performance measurement. According to them, it is very crucial that the IT managers create an organizational culture that facilitates innovation and helps understanding the practices of IT governance. National culture has also been identified as an influencing factor on the IT governance performance by Zhong et al. (2012). The authors indicate that the congruence between culture and IT governance mechanisms can improve the likelihood of effective IT governance performance.

The above four sections describe how the role of culture was studied in each of the five focus areas of ITG in previous research. Some of the papers were found to cover the role of culture in more than one focus area of the IT governance and they have different cultural approaches that are explained bellow. Table 5 provides the categorization of the reviewed papers based on the focus area of IT governance they study and the level of culture they focus on.
Table 5. Literature survey results using the practical perspectives of IT governance five focus areas

<table>
<thead>
<tr>
<th>Reviewed Paper (Author)</th>
<th>Cultural Focus</th>
<th>IT Governance focused area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Value Delivery</td>
</tr>
<tr>
<td>Prinz, 2015</td>
<td>National</td>
<td>X</td>
</tr>
<tr>
<td>Gu et al., 2014</td>
<td>Organizational</td>
<td></td>
</tr>
<tr>
<td>Janssen et al., 2013</td>
<td>Organizational</td>
<td></td>
</tr>
<tr>
<td>Zhong et al., 2012</td>
<td>National</td>
<td>X</td>
</tr>
<tr>
<td>El-Mekawy et al., 2012</td>
<td>Organizational</td>
<td></td>
</tr>
<tr>
<td>Erasmus et al., 2012</td>
<td>Organizational</td>
<td></td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Level</td>
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<tr>
<td>-----------------------------------</td>
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<tr>
<td>El-Mekawy &amp; Rusu, 2011</td>
<td></td>
<td>National</td>
</tr>
<tr>
<td>Nurgubu &amp; Sunando, 2011</td>
<td></td>
<td>Organizational</td>
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<tr>
<td>Satidulam et al., 2011</td>
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<td>Organizational</td>
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<tr>
<td>Al majali &amp; Dahlin, 2010</td>
<td></td>
<td>Organizational</td>
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<tr>
<td>Silvious et al., 2009</td>
<td></td>
<td>Organizational</td>
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<tr>
<td>Silvious et al., 2009</td>
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<td>National</td>
</tr>
<tr>
<td>Xiao &amp; Dasgupta, 2005</td>
<td></td>
<td>Organizational</td>
</tr>
<tr>
<td>Cormack et al., 2001</td>
<td></td>
<td>Organizational</td>
</tr>
</tbody>
</table>
As it is represented in Table 5, four out of five focus areas received attention by the previous literature and there was no paper found investigating on the role of culture on risk management area of IT governance. That is the reason that there are four sections bellow discussing how the role of culture was studied in IT governance by previous researchers.

It was found that among the papers reviewed there are two main levels of culture considered: national and organizational. Ten research papers selected the organizational culture and three selected the national culture perspective. This represents the importance of organizational culture role on IT governance in comparison to the national culture from the previous researchers perspective. Additionally the models, frameworks and dimensions used for studying the role of organizational culture on IT governance are more recent than the ones used for studying the national culture role. Speaking of the models, frameworks and dimensions, it is beneficial to specify the ones used in the reviewed papers. Regarding the used organizational culture values and concepts include: dimensions introduced by Belassi et al. (2007), Naor et al. (2010), Schein (2010), X model of organizational culture Smit (2008), Johnson and Scholes (1993), OCAI model introduced by Cameron & Quinn (2011) and Hofstede (1985). The national culture values and concepts used in reviewed papers include: GLOBE project dimensions introduced by House et al. (2001) and Hofstede et al. (1990) national culture model. The organizational culture approach is found to be more relevant in IT governance studies and it received more attention from the scholars and practitioners. However none of the studies provide exact details on which aspects or dimensions of the organizational culture is influencing what components of IT governance and in which way. This is a very significant gap found in the previous literature that can be studied in detailed resulting in precise linkages between organizational culture dimensions and IT governance components.

The above findings provoke the idea for future studies seeking what are the influences of organizational culture and structure on IT governance.

4.2. The Organizational Structure that Supports IT Governance Implementation (Research Question 2)

Through a case study at a large construction company in Sweden (Company A), the organizational structure changes while applying IT governance
practices in a large IT project (the ITP project) were studied. ISO/IEC 38500:2008 IT governance standard is used as the lens for data analysis due to its novelty and the lack of empirical research around it. In summary, the organizational structure affected the level of support for each function of the IT governance standard. It can be concluded that all of the IT governance practices of the ISO/IEC 38500:2008 were recognized in the ITP project.

4.2.1 The Organization of the ITP Project

To accomplish the changes needed for implementing IT governance project ITP, a new temporary organization was built around the IT governance project development in order to govern all the related processes. The “steering group” leads the new temporary organizational structure. On a lower level after the steering group is the head of the development project. The organizational structure for ITG project is portrayed in Figure 8. The development project includes several processes with different scopes. A leader called “part project leader” is assigned for every part and process. The way that steering group, project leader and reference group are structured remains the same during the whole project.

As is represented in Figure 8, on the top of the organization structure is the steering group that includes high-level employees with management positions. The head of process development, the financial officer, regional executives and IT managers are some of the examples of people working at the steering group. The steering group takes all the critical and important decisions; these include decisions regarding time and budget. Because of the hierarchy in this structure, there is a distance between the part projects and

![Figure 8. Project ITP organization in Company A (simplified)](image-url)
the steering group. Most of the times this the interaction between these two parts take place through the project leaders. To provide an external view of the project development, a reference group is formed. The task of the reference group is to deliver rapid feedback about the way the project is functioning. The main concern of the reference group is on the overall development of the project. The reference group setting differs during the project time. This setting is based on the focus area of the project development that may need involvement of different people with different specialties. On a broader level, the group typically consists of employees that are working in construction projects, such as project leaders and business managers. The reference group was beneficial in configuring what the ITP project should contain. The reference group was also helpful in recognizing the most effective way the ITP project is supporting the construction processes. There are several processes under the responsibility of the project leader that run concurrently to complete the development of ITP project. These processes are called part projects. The part projects run for certain periods of time. The ITP project is one of them. The part project will be continued later by the implementation project. These different groups of the new organizational structure work closely together. There are also some overlaps between different groups working on different layers of project. The feeling of harmony and working as a group, which is caused by the new structure, is one of the success factors in project ITP. The problems are not assumed to be caused by a single group but are rather the responsibility of the project organization as a whole. Each part project is eligible for decision-making on their own responsibility and has the power for that.

4.2.2 ITG Implementation Project aligned with Business

Project ITP is part of a larger project development. This development project is a wide-ranging project aiming to make the organization more efficient. A new portal implementation was defined as a part of this large project. The ITP project was generated in order to ease and clarify the processes workflow and make them more efficient than the prior processes. “The goal is to support business activities through an easy to use portal. This means that if a customer accepts an offer and Company A wins the contract to build a bridge from the government, the project will easily be transformed from the offer phase of the project into a construction project through the portal”. In this way, the ITP project covers the project end-to-end (represented in Figure 9).

The new portal aim is to gather all the information regarding the project in one database. Through this portal, it should be precisely visible which person is responsible for which task and daily progress reports. It is also possible for
employees involved in the project to share information through the portal. In this way, the portal works as a tool to monitor construction projects and promote simplicity and transparency of the processes and stored data.

Decisions on what to included in the ITP project are mostly concerning about two questions, which are: “1) What business process do we need and want this solution to support? 2) What can be delivered through IT and what is feasible within Company A’s limitations?” Another important issue that should be considered is that the external partners who are not inside the organization need to be able to work with portal and develop the function of cooperation with business partners. Additionally, the way that the work processes are designed in the company A should be the basis for creating the portal (business process adaptation). This is depicted in Figure 10.
As shown in Figure 10, the three main aspects of Company A including the values, business development and operational aspects are considered to be covered by the IT governance ITP project.

4.2.3. IT Governance Practices Mapped with the Organizational Structure


The following section considers each of the principles of the ISO/IEC 38500:2008 to analyze the IT governance implementation in the ITP project. The specific organizational structure component mapped to cover each of these principles is described. It is important to note that these organizational structure components are particularly allocated to the IT governance ITP project coverage and are based on the new temporary organization structure set up by the IT group within the ITP organization. (This new temporary organization structure is illustrated above in Figure 8.)

This analysis is based on data gathered from the interviews with Company A ITP project managers to ascertain their IT governance practices. They are mapped according to ISO/IEC 38500:2008 principles and then allocated the organizational structure components to cover each of the principles identified using the same data and considering the new temporary organizational structure introduced by the IT managers of the ITP project.

**Principle 1: Responsibility**

Evaluation of the responsibility principle is done through the steering group, reference group, project leader, group leader and project implementer. The steering group at the top leads the organization of the ITP project to divide the decision-making and responsibilities among different positions. What the reference group evaluates regarding the responsibility principle is the provision of feedback on project progress; the project leader is responsible for checking that feedback. The group leader on a lower level is responsible for each IT development group and the project implementer is responsible for the implementation of each IT project.

The direction of the responsibility principle is covered through the hierarchy of the organizational structure. The steering group members take the critical decisions in higher positions. The lower level decisions are taken by other positions in the hierarchy. The ITP project leaders at each stage take decisions related to their own part. Since this organization structure is
temporary and specific to this project, it was mentioned by the IT managers that after the project has been implemented completely, the roles and decision-making rights might change.

The steering group members, together with the reference group members, monitor the responsibility principle. However, they will change their monitoring functions after the project has been completely implemented and the organization structure specified for the ITP project will be reformed.

**Principle 2: Strategy**

The new strategic direction taken by the whole department should be supported by the project ITP; this is called the strategic fit and is evaluated by the steering group members of the ITP project structure.

The direction of the project ITP strategy is derived by the business objectives of the company A and this strategic direction is set by the steering group members. The steering group identifies the strategy and then the technical IT solutions supporting the strategic direction are provided by the IT groups.

Monitoring the strategic direction of the ITP project is done by the steering group as well. This process is a long term process since the some of the results and effects of the ITP project in relation to the strategic objective might not show until years later. The ITP portal project is monitored to keep up with changes in business strategy or new technical developments.

**Principle 3: Acquisition**

The evaluation of the acquisition principal is covered by the group’s leaders for different IT procurements including hardware, software and human resources.

The direction of the acquisition principal is mostly related to budget allocated for different IT project. The steering group is the one deciding for budget allocation and direction. Each IT group can make propositions on what resources they acquire and the steering group can make decision about it.

Monitoring the acquisition principal deals with IT investments and whether they reach their intended objectives. The performances of internal IT resources and the IT consultants are monitored by the relevant IT group leaders. This way they get updated about which resources are needed at each project phase in each group.

**Principle 4: Performance**

Evaluation of the performance principle involves different positions of the organization structure in the ITP project. Project developers, project implementers, IT group leaders and the reference group are all involved in this process. Top managers of the ITP project, including the steering group, receive feedback from other parts of the project. The feedback is provided after running tests and pilots. Problems are reported and potential risks are
evaluated. The number of portal users and projects linked to the portal is also measured. Different feedbacks from the portal users are also collected.

The direction of the performance principle deals with the budgetary means and also the parameters and metrics that should be measured. The steering group is the one directing budgetary issues after evaluating the performance; it also sets the performance goals and metrics.

Monitoring the performance principle includes monitoring the risks, acceptance of the portal in the organization, feedback collection, and the backups and security issues of the ITP project, and is done by different positions mentioned earlier.

**Principle 5: Conformance**

Evaluation of the conformance decision about anonymity and personal information included in the portal. IT group leaders need to perform the evaluation of the conformance. They need to make sure that the ITP portal project like any other IT governance project follows the rules, regulations, industry standards and company values.

The direction of the conformance is in relation entire organization conformance and is not an isolated issue for the ITP project. The IT group leaders direct functions to support desired conformance standards. Internal company lawyers are also consulted in this regard.

Monitoring the conformance and the standards that should be followed by and is a companywide concern. The monitoring is done different levels by IT group leaders. The final monitoring however is done by the general organization managers when the ITP project implementation is finalized.

**Principle 6: Human Behavior**

Evaluation of the human behavior is covered through different layers of the hierarchy. The reference group and IT group leaders take care of this issue. The way the employees work currently and the way they will work in future regarding different phases of the ITP are evaluated. Evaluation is done through feedback from the portal users. The feedback collection and human behavior evaluation include different actions such as informal and formal meetings with different users of portal, customer and client feedback collection and yearly evaluation survey specific ITP project.

The direction of the human behavior is different programs after the evaluation. The employees and portal users can log problems or suggestions through an internal system embedded in portal. There also meeting of the IT groups every two weeks to follow up the developments and working behavior of portal users. Training session regarding ITP that can be to day seminars. All employees working directly or indirectly with the ITP project need to take relevant courses. Monitoring of the human behavior is done through different formal and informal channels and meetings to problems and changes in human behaviors to improve the ITP performance.
Figure 11 represents in summary how the new temporary organization structure specified for ITP project supports different principles of ISO/IEC 38500:2008 mapping IT governance in the ITP project.

As is shown in Figure 11, the steering group on the top of organization structure is leading the whole project development. The reference group is providing feedback on different phases of project progress and the reference group comprises different people involved in the project. The development head on a lower level manages all the part projects running under the general project. Each specific group has its own responsibility and needs to report the head of that specific group. Although the different parts of project are separate from each other, they cooperate with each other for the benefit of the general project. This study demonstrates an IT governance implementation case with a well-developed organization structure linked to ISO/IEC 38500:2008 and also shows that ISO/IEC 38500:2008 is a worthwhile instrument for recognizing IT governance practices in IT governance implementation projects.
4.3. The Role of Different Organizational Culture Types in IT Governance Performance (Research Question 3)

In this section, results from a second case study are analyzed according to the conceptual framework defined to ascertain how the organizational culture type influences the IT governance performance. The results from this case study answer the third research question as well as providing insight into necessary future research and directions on the continuation of this research.

4.3.1 Conceptual Framework

The conceptual framework shown in Figure 12 is followed to address the goal of this research that is finding out how the organizational culture can influence the IT governance performance. Both OC and ITG performance measurement concepts should be recognized through proper objectives. OCAI model is used for OC and the objectives introduced by Weill and Ross (2004) are used for ITG performance measurement. Through this conceptual framework, this research is directed and the analysis is according to it.

Figure 12. Conceptual framework of the OC influence on ITG performance
As shown in the Figure 12, the OC is studied through the lens of OCAI dimensions. The six dimensions are shown in the first rounded rectangle from left which are: dominant characteristics, leadership style, management of employees, organizational glue, strategic emphases and criteria of success. Through these six OC dimensions, the organization can be grouped as one of the four cultural types of clan, adhocracy, hierarchy or market. Additionally, on the right rounded rectangle in Figure 1, the objectives of ITG performance are represented.

Since the goal of this research is to find out how the OC can influence the ITG performance, the arrow in Figure 10 is directed from OC to the ITG performance. The results of this research will explain whether and how exactly organizational culture has an influence on each of the four objectives of the ITG performance. Thus the analysis of the empirical data is done through 4 themes of: 1) The influence of OC on cost effective use of IT, 2) The influence of OC on effective use of IT for asset utilization, 3) The influence of OC on effective use of IT for growth; and 4) The influence of OC on effective use of IT for business.

4.3.2. Case Description and Organizational Structure

The studied case is the IT department of a large construction company headquartered in Sweden, anonymously called ITS in this research. ITS has 220 employees providing most of the IT services for the whole company. At the IT department they have almost a traditional structure with CIO on the top and some senior managers, middle managers and the managers for small team. They have their own finance and HR units. All the operating and delivery functions are distributed to four main groups of: 1) service integration and support, 2) local application services, 3) Nordic global application services and 4) infrastructure services and then each of them has some IT sub units and groups (Figure 13).
The senior managers of these groups are in direct communication with the CIO (meetings every second week) and the CIO has board meeting every quarter with the business managers and business liaisons which are the communicators between IT and business units. At the IT department the environment is international and the communication language is English.

4.3.3. IT Governance Performance at ITS

The total ITG performance score for ITS is calculated by applying the data collected from ITS into the formula from Weill and Ross (2004) introduced earlier in the research background. The total ITG score gained by ITS is **62.74 out of 100**. This score is close to the average score of the 256 companies studied by Weill and Ross (2004) which is 69. Figure 14 represents the scores for each of the ITG outcomes. As it is shown in Figure 14, cost – effective use of IT has received the highest and effective use of IT has received the lowest average score at ITS.

![Figure 14. The average success score for each ITG performance outcome in ITS](image)

4.3.4. Organizational Culture at ITS

As shown in Figure 15, OC at ITS is more directed to the clan culture now (30.35 out of 100) and the preferred culture for future is directed almost equally to both clan (29.04 out of 100) and adhocracy (25.35 out of 100).
The OCAI assessment done by the organization also showed that they are more clan oriented now but prefer adhocracy culture; this confirms findings of this study. These results represent that at the current situation with the clan oriented OC, the organization is a friendly place to work, the relationships and communications are mostly in an informal way, said the interviewees. Comparing the preferred OC orientation with the current one shows that they have the highest difference in the adhocracy quadrant (Now: 15.71 and preferred: 25.35). This reveals that they prefer to move to the adhocracy type of culture in a great level and keep the clan type almost in the same level and decrease from the level of orientation in hierarchy and market culture. Research confirms that in successful organizations there should be some kind of congruence in their OC (OCAI online, 2010). This means that regardless of the total culture type in their organizations, they have a relatively similar culture type in each of the six dimensions of the OCAI framework. The more congruent the culture types are, there will be less interorganizational conflicts. The incongruence between some of the dimensions usually makes the managers aware of a necessary change. The incongruence may be because of the people with different ideas in different departments of

![Figure 15. OCAI assessment results of organizational culture type in ITS](image-url)
the organizations or because of different positions of the people in the organization structure. Table 6 represents the culture type in ITS in each of the six dimensions of the OCAI model.

Table 6. ITS Now (N) and Preferred (P) culture type scores for six organizational dimensions

<table>
<thead>
<tr>
<th>Organizational Culture Dimensions</th>
<th>1 Dominant Characteristics</th>
<th>2 Organizational Leadership</th>
<th>3 Management of Employees</th>
<th>4 Organization Glines</th>
<th>5 Strategic Emphases</th>
<th>6 Criteria of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture Type</td>
<td>N</td>
<td>P</td>
<td>N</td>
<td>P</td>
<td>N</td>
<td>P</td>
</tr>
<tr>
<td>Clan</td>
<td>29.28</td>
<td>22.15</td>
<td>25.72</td>
<td>25.72</td>
<td>35</td>
<td>37.85</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

As shown in Table 6, the scores are divided among each type of culture for each of the six dimensions of organizational culture with a total of 100 for each dimension. These results together with the interviews data show that the incongruence in ITS organizational type is in “leadership” and “criteria of success”. This means that in these two dimensions, the organizational culture assessment has different results and it is not clan oriented like in the other dimensions. Regarding the preferred changes on OC type the “dominant characteristics” and “organizational leadership” turned out to be more preferred to be changed by the ITS; in both of them the desired change is to adhocracy. The clan culture at the current situation of ITS and the preferred move to be more adhocracy reveals the influence that clan culture had till now on their ITG performance and also the need to be more adhocracy directed based on the need they have for their ITG performance improvements. Additionally, at ITS they have defined OC values of being generous, creative, accountable and team players. According to CIO these values are defined to make clear their cultural journey.
4.3.5. Analyzing the Influence of Organizational Culture on IT Governance Performance

Based on the conceptual framework of this research, the results found regarding the influence of OC on ITG performance are analyzed through the four themes of OC influence on four outcomes of ITG performance. In Table 7 are presented the key findings from the interviews expressing the influence of OC on ITG performance at ITS.

Table 7. Summary of key findings at ITS sorted through four themes of research conceptual framework

<table>
<thead>
<tr>
<th>Four defined themes of this research</th>
<th>Key findings from interviews for the influence of OC on ITG</th>
<th>Interview extracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC and Cost-effective use of IT</td>
<td>Clan culture and being team players led to work within the budget. Clan culture helped for fixing the basics (reducing costs by IT). Clan culture is not enough for bringing more value from IT.</td>
<td>“In ITS we have a very clan oriented ... being team players is one of our cultural values which leads us to use the most of our teams within the limited budget” (CIO)</td>
</tr>
<tr>
<td></td>
<td>Missing creativity and innovation is causing low use of IT for growth. Moving to adhocracy culture will lead to improve ITG performance in terms of uniqueness and innovation</td>
<td>“We have a clan culture now but we need to have more adhocracy in balance with market and hierarchy” (CIO)</td>
</tr>
<tr>
<td>OC and Effective use of IT for asset utilization</td>
<td>Using expertise from separate units (asset utilization) is challenging because of OC. The informal communication through clan culture reduces the level of knowledge integration (asset utilization).</td>
<td>“ITG four defined cultural values can help us to be more competitive and improve IT governance performance” (Service and project manager)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“we are really missing creativity in our culture which is needed for IT governance performance” (Senior manager 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“moving to adhocracy will help us to improve IT governance ... risk taking, innovation, freedom and uniqueness in our culture are very low at the moment” (Service and project manager)</td>
</tr>
<tr>
<td>OC and Effective use of IT for business flexibility</td>
<td>Clan Informal communication is helpful for business flexibility in some levels, but not in all of them. Cultural differences make it challenging to adapt with new business needs.</td>
<td>“The most difficult part of ITS governance is to deal with separate local units and the main reason is the organizational culture” (Senior manager 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“we produce a lot of information in each project but we are not good in using them”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“our expertise are mainly used outwards and within each single group is not integrated through all ITS ... we do not share knowledge assets within groups” (CIO)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“most of our communication is informal and that is why sometimes in the beginning of projects we do not have information on what resources we have” (IT supplier manager)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“communication is not very formalized, in some levels we have SLA or use some maintenance objectives, but we need to have the same structure” (Senior manager 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“in some units we have more hierarchy culture and it is a challenge working with new partners or stakeholders when they decide to make changes” (middle manager 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“the gap between executive management and senior executive teams is affecting their IT governance and responding to the changes” (business liaison)</td>
</tr>
</tbody>
</table>

An analysis was also done using NVivo 10 software for qualitative data analysis in terms of word frequency and similarity for each of the conceptual framework themes (Figure 14). Figure 14 shows the clusters through which the analysis of the interviews were directed to find the influence from each
of the four OC types on each of the four objectives of ITG performance. The clusters are sorted based on the word similarity in each node. According to the results, those nodes that received more words in common are linked with a shorter line to each other. The linkage between all the nodes are shown in Figure 16 but since it is only based on word analysis we only consider a relation between 2 nodes when they are on the top close related ones compared to the others.

As represented in Figure 16, there is closer relation between adhocracy OC type and effective use of IT for growth and also clan culture and cost-effective use of IT based on the word similarities.

4.3.6. Organizational Culture Influence on Cost-Effective Use of IT.

The company has the highest score (3.57) for cost-effective use of IT among the other outcomes of ITG performance. This means that IT has been more successful in financial terms and being beneficial for the business. The reason is that during the past 5 years they have been focusing only on providing the needed services from business with a limited budget. “Fixing the basics” was the only task they have focused to do. As part of their culture they were looking to create trust among the employees and also between the business and IT and the first issue that could fix it was to price the services in an accurate way. Having a clan culture with its characteristics such as mentoring style of leadership, loyalty and mutual trust and commitment among employees has helped ITS to achieve a high score in
cost-effective use of IT. Having a high score in this outcome of ITG performance is matching with their strategy in those past 5 years. As indicated by the CIO and other interviewees “being team players” has helped them to use the most of their teams. Team work, consensus and participation are part of the employee management style defined for organizations having a clan culture. Most of the communications are informal at ITS as part of their clan culture and only in case of problems or incidents they follow some processes for communications. This issue has helped them to provide the requested services from business in a cost – effective way. On the other hand ITS has many local systems with different ways of working and the individuals who are experts are located in different units which are not communicating. The challenge that the organization is facing now is that the communication and cooperation among these units are not strong and this is affecting the cost-effective use of IT. “our projects are becoming more and more similar, therefore we need a more organized way of communication for sharing information and integrating our services, this way we can stay cost-effective and prevent duplications” says vice president of service management. Directing the OC to a more adhocracy oriented culture while keeping the clan, hierarchy and market culture in balance, will help the IT department to fix the problem of communication between their internal units. According to the interviewees, they have grown a lot and their projects are becoming more and more similar, therefore they need a more formal and organized way of communication between their groups. They need to be able to use the big amount of data existing in different units and grasp the innovative ideas from their experts. The organization’s desire to have a higher level of adhocracy type of culture is aligned with the previously mentioned objectives and approves the influence of their type of OC on managing their cost-effective use of IT.

4.3.7. Organizational Culture Influence on Effective Use of IT for Growth

Effective use of IT for growth has the lowest score (2.57) in ITG performance. This objective deals with IT being effective in learning in organization, being innovative and competitive and making improving changes. This means that IT has not been so successful in having a driving role in business strategies and being innovative. This is exactly matching with what is stated by the IT managers that at the moment they have been successful in delivering the needed services from business but they are looking to have more innovative solutions and bring competitive advantage from IT to business. As mentioned by one interviewee, they are “not brave enough to make creative decisions and be risk taking” since their first priority was to stay in budget. As shown is the Figure 14 they received the
highest score for Cost-effective use of IT and lowest in effective use of IT for growth. It is also very important that in their future vision for their OC, the type of culture that they want the most attention to is adhocracy. Adhocracy is the type of OC in which the focus is more on innovativeness, creativity and entrepreneurship. After focusing on fixing the internal issues and basic needs, as the next step they are looking to have external focus and differentiation with being innovative. CIO of ITS believes at this point they need to be “more competitive and proactive” to improve ITG performance. ITS current clan culture and having generosity as one of their OC values, helps them to be open and share the processes and work together. But since they have only focused on providing the business requested service till now, they have not been very creative and innovative to use the expertise distributed in their different units. If they change their OC to a more adhocracy oriented culture specially in dominant characteristics and organizational leadership dimensions (as it is shown in Table 1) they can be more innovative and improve their effectiveness of IT in growth. Additionally the new style of working used by ITS recently is influencing the effectiveness of IT in growth in different ways. They are using “Activity Based Workplace” (ABW) method, in which the employees do not have specific desk and they need to find a place to sit every morning. This is part of their clan culture to have a friendly environment and also the cost saving strategy. According to the statements of the IT managers in different levels, this method of working helps them to be connected at anytime and anywhere they are. On the other hand with this way of working sometimes the employees cannot find a place next to the people they work with every day and according to some interviewees this issue has reduced their performance during last year. This method works for the higher level employees and managers who are busy and cannot be found in their offices easily and communicate informally most of the times, but for the employees working with maintenance services for instance, ABW may not be very effective. The ABW method also requires employees to communicate through their internal blog. The advantage is that they can reach each other anytime and anywhere. However this makes their conversation limited to only fixing the problems and there is no chance of talking about new and creative solutions. People need to send messages to each other and then if needed have video talk or meeting and if necessary meeting face to face for which they need to book a room. This process makes employees lazy to communicate about any innovative solution and they only aim to fix their problems and finish their assigned projects. If ITS seeks for more innovative and competitive solutions, they need to change their culture in a way that people are more willing to communicate about new solutions (adhocracy).
4.3.8. Organizational Culture Influence on Effective Use of IT for Asset Utilization

Effective use of IT for asset utilization is dealing mostly with how IT is successful to use the knowledge based assets. At ITS all the operating and delivering functions for IT services are divided through four main groups of service integration and support, local application services, Nordic global application services and infrastructure services. The CIO meets every second week with the heads of these four groups and there are also informal communication among them, at the lower levels the similar way of communication exist between the other senior managers and middle managers of each group which is resulted from their current clan oriented OC. The effective use of IT for asset utilization with the score of 3.14 out of 5 is almost in medium level for the whole organization. The challenging cultural issue influencing the effective use of IT in ITS is the lack of integration among different groups. The CIO and other interviewees indicated: “we are producing a lot of data and they are not using it in a systematic way”. That is exactly where IT should be helpful most and can make a difference by making all that data accessible, integrated and reusable. The organization desire to be more adhocracy oriented as their preferred OC is in fact aligned with what they expect from IT regarding asset utilization; ITS seeks for being more innovative in using new resources, optimizing the use of their experts and data and being entrepreneur. In ITS current clan oriented OC most of the communication is informal and according to the interviewees this is not working in some cases that they need to receive the needed information on time. As emphasized by the service manager and supplier manager of ITS, they have the capacity management problem. For instance they have many IT projects with large groups working on them and sometimes it happens that they are in the middle of the work process and they have no information whether they have all the needed resources to deliver the project. They should have received information before start of each project from supply manager. The clan style of organization leadership, mentoring and communication is not sufficient in such huge dispersed groups needing organized knowledge integration.

4.3.9. Organizational Culture Influence on Effective Use of IT for Business Flexibility

The focusing issue in effective use of IT for business flexibility is how IT is successful to help the business to respond to the internal and external changes in an optimized way and speed. ITS received score 3.14 out of 5 for this ITG outcome. The clan culture they have now together with the common Swedish flat organization structure, have helped them to be responsive to the business changes. The managers of the IT group responsible for each
business unit are able to make their own decisions for their unique projects; this helps them to response quickly to business changes. ITS cultural value of “being accountable” also encourages the employees to be accountable in making the needed improvements. On the other hand they have a large organization with almost 12000 IT users only in Nordic countries and 220 IT providers. As mentioned by the interviewees “it is challenging to make the interfaces in a way that a regular manager knows how to use it and provide the exact service they need”. In different IT groups, they have different degree of change acceptance and speed. For instance the IT service and project management group is ready for rapidly changes as part of their culture, but the level of change acceptance is lower in other groups such as service maintenance. As it was mentioned for the other ITG outcomes, the business now requests the IT to have a more strategic role to understand how to add value and not only fixing the basics. The IT then needs to be more innovative to be able to respond to this new business need. At the current situation with their clan culture, the higher managers are only looking for the tasks to be done but not really encouraging employees or smaller groups to present their new ideas. One problem mentioned by some IT employees is that they do not receive appropriate and on time feedback from the higher managers or from the business stakeholders. More orientation to adhocracy cultural type can help them to reach this goal since adhocracy is more focusing on being an innovative and entrepreneur organization.
5. Conclusions

In this chapter, the contribution of this research is presented, along with a statement of the limitations of the research. The study ends by introducing future research directions, looking at how this research will be continued.

5.1. Contributions

The goal of this research was to analyze the organizational culture and structure influence on IT governance. In order to reach this goal, three research questions where formulated. The contributions based on this research goal are in accordance with the results given in the former chapter, which answer each of the three research questions. The contributions of this research are mainly as follows.

i) The role of culture in IT governance: categorization of prior research and identification of gaps in this field.

ii) The organizational structure that supports the implementation of an IT governance project.

iii) The influence of organizational culture type on IT governance performance in an IT organization. The above contributions have answered the research questions step by step and together addressed the goal of this research.

i) The literature survey as the first step was performed by: 1. identifying the key terms in research field; 2. locating literature in a topic by accessing several types of material and databases; 3. critically evaluating and selecting the literature for review; 4. organizing the designated literature; and 5. writing a literature review reporting outlines of the literature. The final eight articles included in this literature review were written between 2009 and 2013, which demonstrates that the topic of culture in IT governance has only recently received attention from researchers. The framework introduced by Van Grembergen and De Haes (2009) was used to categorize the research about the role of culture in IT governance into three different issues: structures, processes and relational mechanisms. Some of the researchers had focused their study on national culture and some on organizational culture (summarized information included in Table 4). According to this literature
review, the cultural issues at national and organizational levels such as employees’ timing, accuracy, loyalty, change resistance, individualism and friendly environment proved to be influential on the IT governance components including structures, processes and relational mechanisms. This part of the research contributes to knowledge in the field of IT governance by reflecting the importance of the role of culture in IT governance at different levels. The absence of cultural elements in IT governance practices and approaches was observed and noted by previous researchers. At the same time, this part of the research provided evidence that there is a lack of knowledge and in-depth understanding of how culture can influence IT governance using new and specific models and frameworks.

ii) The organizational structure and the way it needs to support the implementation of IT governance was studied in the second part of this research. A case study in a large construction company headquartered in Sweden was used to find the organizational structure needed while implementing the IT governance practices. ISO/IEC 38500:2008 IT governance standard was used as the lens for identifying the IT governance practices and the organizational structure supporting them. This study demonstrates that the ISO/IEC 38500:2008 is a worthwhile instrument for recognizing IT governance practices in IT governance implementation projects. This research can be counted as an additional contribution to the field by showing that the organizational structure need to support the IT governance project implementation and it should be formed in a way that covers the IT governance practices and principles. Through the IT governance implementation in this case, the organizational structure is supporting open communication channels in the organization, providing a good feedback collection process. Therefore it is suggested that IT governance practices should not be applied isolated but should be applied only after assuring that the supporting organizational structure exists. IT project implementation in this order leads to a higher degree of transparency. The organizational structure was observed to be very effective in IT governance performance. This, together with the findings from the previous part of this research, leads to the next part of this research. The next study, which was also done through a case study, investigated how organizational culture influences the IT governance performance in a firm.

iii) The final part of this research provides evidence that there is an influence by organizational culture on IT governance performance. The OCAI assessment tool was used in a case study in the IT department of a large construction company in Sweden. Depending on what type of organizational culture the firm is more directed toward (in this case, the clan culture), there is a different result in each of the four outcomes of IT governance, including cost effective use of IT, effective use of IT for
growth, asset utilization and business flexibility. In particular, the characteristics of organizational culture types involving communication styles, innovation and creativity acknowledgements were found to influence the IT governance performance in most of its outcomes. Having a more clan-oriented culture at this organization has influenced them in getting a higher score for the cost-effective use of IT outcome of their IT governance performance. However in such large organization, clan-oriented culture has caused disintegration, disability in optimized use of produced information, missing creativity and innovative solutions, and fear of taking risks.

All in all, the results of this research may have a clear impact on the research concerning the influence of organizational culture and structure on IT governance. Both researchers and practitioners may benefit from the results to some extent. The researchers will find some theoretical and empirical results on how the organizational culture and structure influence the IT governance; the practitioners will also find examples of real cases of how organizational culture and structure is influencing IT governance implementation and performance.

5.2. Limitations and Further Research

This research focuses on how organizational culture and structure can influence IT governance. However, this research is affected by some limitations that include the following. The literature review considers those articles directly focusing on cultural influence on IT governance among a pool of papers in a certain period of time, which can be counted as a limitation of this research. Furthermore, the results of this research should be used cautiously, since the case studies employed are done in the IT departments of two large construction companies headquartered in Sweden that have their own specific situations.

Different future research directions are also revealed based on the results of this thesis. A potential future topic could involve studying the organizational structure and culture of different IT units as separate entities and how they influence IT governance. Another orientation in a future research could look at the changes in organizational structure and culture that are needed to improve IT governance performance. Finally, the development of a framework for IT governance-organizational culture that includes the organizational culture dimensions which support IT governance performance could be beneficial for both researchers and IT practitioners.
References


Myers, M. (2009). Qualitative Research in Business and Management,


## Appendix A: Case Study 1 - Interview Questions

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>General background questions</td>
</tr>
<tr>
<td></td>
<td>Your position and your background</td>
</tr>
<tr>
<td></td>
<td>When did you get involved in the project and in what phase was the project in at that time?</td>
</tr>
<tr>
<td></td>
<td>What is your role in the project? Reason of Project &amp; Portal</td>
</tr>
<tr>
<td>2</td>
<td>Background and initiation of the portal</td>
</tr>
<tr>
<td></td>
<td>What role does the portal play in “Utvecklingsprojektet” (Development project)?</td>
</tr>
<tr>
<td></td>
<td>Draw a project timeline? /What problem did/will it solve?</td>
</tr>
<tr>
<td></td>
<td>How does it create value internally and externally? Against competitors? Anyone else with a similar function?</td>
</tr>
<tr>
<td>3</td>
<td>Forming the project</td>
</tr>
<tr>
<td></td>
<td>(COBIT 5, Principle 1, Meeting stakeholder needs) &amp; (The Seven Phases of the Implementation Life Cycle)</td>
</tr>
<tr>
<td></td>
<td>What aspects were most important when creating the portal? Business objective?</td>
</tr>
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<td></td>
<td>Key value drivers? How are people outside of Company A affected by the project? Were customers and suppliers consulted?</td>
</tr>
<tr>
<td></td>
<td>What are their requirements? How does that turn into IT related goals for the project?</td>
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<tr>
<td></td>
<td>What is the biggest difference before and after for customers and internally?</td>
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<tr>
<td></td>
<td>Did you look at similar solutions?</td>
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<tr>
<td></td>
<td>Did you look into any specific frameworks or models?</td>
</tr>
<tr>
<td></td>
<td>Did you consult anyone?</td>
</tr>
<tr>
<td></td>
<td>How is the organization formed around the Portal; Business units &amp; responsibilities? (Draw organizational chart?)</td>
</tr>
<tr>
<td></td>
<td>Who is responsible for the “IT side”? Talk more about that relationship</td>
</tr>
<tr>
<td></td>
<td>Is the relationship ever evaluated or modified? When fully rolled out, what will the organization around the project look then?</td>
</tr>
<tr>
<td></td>
<td>How does business strategy drive IT development in this project? Is IT as support</td>
</tr>
<tr>
<td>6</td>
<td><strong>ISO/IEC 38500:2008 Principle 3 Acquisition</strong></td>
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<td>---</td>
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</tr>
<tr>
<td>Have there been any IT investments for this project? (Hardware/Software/Services)</td>
<td></td>
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<tr>
<td>Who is responsible for procuring?</td>
<td></td>
</tr>
<tr>
<td>How were these decisions made?</td>
<td></td>
</tr>
<tr>
<td>Are procurements evaluated? (Hardware/Software/Services), How?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7</th>
<th><strong>ISO/IEC 38500:2008 Principle 4 Performance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the performance of the Portal be measured?</td>
<td></td>
</tr>
<tr>
<td>How? (frequency, usability, down time, complaints?)</td>
<td></td>
</tr>
<tr>
<td>Are there criteria that the portal is supposed to meet?</td>
<td></td>
</tr>
<tr>
<td>Are other unit’s measured?</td>
<td></td>
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<tr>
<td>Is there a budget set related to the IT solutions? Is there a budget follow up for the project? How often?</td>
<td></td>
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<thead>
<tr>
<th>8</th>
<th><strong>ISO/IEC 38500:2008 Principle 5 Conformance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there any specific legislation, regulations or standards that you had to adapt to in this project? Any internal policies that you had to consider?</td>
<td></td>
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<tr>
<td>Any ethical issues? Is there a control function within IT to make sure that these rules and regulations are followed?</td>
<td></td>
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</table>

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<tr>
<th>9</th>
<th><strong>ISO/IEC 38500:2008 Principle 6 Human behavior</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>How are people educated to work with the portal? (Internally &amp; externally); Feedback from users?</td>
<td></td>
</tr>
<tr>
<td>Is there a lot of input coming from “down up” in this project? Work in groups? What were the main lessons learned when creating and implementing this portal?</td>
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</table>
Appendix B: Case Study 2 - Interview Questions

Section 1- General Information

What is your position? For how long you had it?

What is your background?

Who do work with inside or outside your company regarding your job?

Section 2- IT Governance framework questions

How do you recognize IT governance in your company?

Who are the people involved in IT governance in your company?

Do you use any measurement framework, model, tool for IT governance performance?

What are the areas where IT governance works best? Why? (Weill and Ross, 2004)

What are the areas where IT governance is not effective? Why? (Weill and Ross, 2004)

How important are the following outcomes of your IT governance, on a scale from 1 (not important) to 5 (very important)?

You can consider the following clues for each of the 4 outcomes of IT governance, but please fill free to consider any other aspect you believe that should gain attention for each of them.

1. Cost – effective use of IT: Mostly in financial terms, how much IT has been beneficial for the business?
2. Effective use of IT for growth: How IT has been effective in
learning in organization, being innovative, gain competitive advantage and making improving changes in your company?

3. Effective use of IT for asset utilization: How successful IT has been to use the knowledge based assets?

4. Effective use of IT for business flexibility: How IT has been successful for your business to respond to the internal and external changes?

<table>
<thead>
<tr>
<th>Governance Outcome</th>
<th>Very Important</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost – effective use of IT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective use of IT for growth</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Effective use of IT for asset utilization</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Effective use of IT for business flexibility</td>
<td></td>
<td></td>
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</tbody>
</table>

What is the influence of the IT governance in your business on the following measures of success, on a scale from 1 (Not successful) to 5 (very successful)?

<table>
<thead>
<tr>
<th>Governance Outcome</th>
<th>Very successful</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Not successful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost – effective use of IT</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Effective use of IT for growth</td>
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<tr>
<td>Effective use of IT for asset utilization</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Effective use of IT for business flexibility</td>
<td></td>
<td></td>
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</tbody>
</table>
What are the communication approaches of the top managers? What methods do they use?

What is your business strategy (Porter: differentiation, focus, cost effectiveness)?

How much the top managers are directly involved in IT governance?

How often do you have changes in IT governance? (Changes in involving who had decision rights for at least one of the key IT decisions)

**Section 3- Organizational culture assessment instrument questions**

For each of the 6 section please divide 100 points among these four alternatives, depending on the extent to which each alternative is similar to your own organization. Give a higher number of points to the alternative that is most similar to your organization. Just be sure that your total equals 100 for each section.

Please fill the “Now” labeled column first which represents your rating how your organization is currently. When you finished please fill the “preferred” column which represents how you think your organization should be in five years to be spectacularly successful.

<table>
<thead>
<tr>
<th>Organizational culture dimension</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Dominant characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>A. The organization is a very personal place. It is like an extended family. People seem to share a lot of them.</td>
<td>Now</td>
</tr>
<tr>
<td>B. The organization is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.</td>
<td>Now</td>
</tr>
<tr>
<td>C. The organization is very results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented.</td>
<td>Now</td>
</tr>
<tr>
<td>D. The organization is a very controlled and structured place. Formal procedures generally govern what people do.</td>
<td>Now</td>
</tr>
<tr>
<td>Total (must be 100)</td>
<td>100</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----</td>
</tr>
<tr>
<td>2. Organizational leadership</td>
<td>Now</td>
</tr>
<tr>
<td>A. The leadership in the organization is generally considered to exemplify mentoring, facilitating, or nurturing.</td>
<td></td>
</tr>
<tr>
<td>B. The leadership in the organization is generally considered to exemplify entrepreneurship, innovation, or risk taking.</td>
<td></td>
</tr>
<tr>
<td>C. The leadership in the organization is generally considered to exemplify a no-nonsense, aggressive, results-oriented focus.</td>
<td></td>
</tr>
<tr>
<td>D. The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.</td>
<td></td>
</tr>
<tr>
<td>Total (must be 100)</td>
<td>100</td>
</tr>
<tr>
<td>3. Management of employees</td>
<td>Now</td>
</tr>
<tr>
<td>A. The management style in the organization is characterized by teamwork, consensus, and participation.</td>
<td></td>
</tr>
<tr>
<td>B. The management style in the organization is characterized by individual risk taking, innovation, freedom, and uniqueness.</td>
<td></td>
</tr>
<tr>
<td>C. The management style in the organization is characterized by hard-driving competitiveness, high demands, and achievement.</td>
<td></td>
</tr>
<tr>
<td>D. The management style in the organization is characterized by security of employment, conformity, predictability, and stability in relationships.</td>
<td></td>
</tr>
<tr>
<td>Total (must be 100)</td>
<td>100</td>
</tr>
<tr>
<td>4. Organization glue</td>
<td>Now</td>
</tr>
<tr>
<td>A. The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs</td>
<td></td>
</tr>
</tbody>
</table>
B. The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.

C. The glue that holds the organization together is the emphasis on achievement and goal accomplishment.

D. The glue that holds the organization together is formal rules and policies. Maintaining a smoothrunning organization is important.

<table>
<thead>
<tr>
<th>Total (must be 100)</th>
<th>100</th>
<th>100</th>
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**5. Strategic emphases**

<table>
<thead>
<tr>
<th>Now</th>
<th>Preferred</th>
</tr>
</thead>
</table>

A. The organization emphasizes human development. High trust, openness, and participation persist.

B. The organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.

C. The organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.

D. The organization emphasizes permanence and stability. Efficiency, control, and smooth operations are important.

<table>
<thead>
<tr>
<th>Total (must be 100)</th>
<th>100</th>
<th>100</th>
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</table>

**6. Criteria of success**

<table>
<thead>
<tr>
<th>Now</th>
<th>Preferred</th>
</tr>
</thead>
</table>

A. The organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people.

B. The organization defines success on the basis of having the most unique or newest products. It is a product leader and innovator.
C. The organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key.

D. The organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling, and low-cost production are critical.

| Total (must be 100) | 100 | 100 |

**Section 4- OC influence on ITG questions**

Do you think the way the relationship between people is defined can affect the performance of your IT governance? (if it is friendly, creative, formal)

Do you think how the employees are managed can affect the IT governance performance?

Do you think how the organization defines its strategy and leadership affects the IT governance performance?

Do you think that the relationships in organization through formal rules or simple communication can affect the IT governance performance?

Do you think that the way the organization defines success is affecting the IT governance performance?
Appendix C: Paper I

Culture Influence on IT Governance: What We Have Learned?

Reprinted from

Appendix D: Paper II

Organizational Structure in IT Governance: A Case Study of an IT Governance Implementation Project

Reprinted from

Appendix E: Paper III

The Influence of Organizational Culture on IT Governance Performance: Case of The IT Department in a Large Swedish Company

Reprinted from