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Project Governance

Master thesis

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DECLARATION

I hereby declare that I am the sole author of the thesis entitled “Project Governance“. I duly marked out all quotations. The used literature and sources are stated in the attached list of references.

In Prague on 7th May, 2018

Signature
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ABSTRACT

The rapid technological progress, which has led to inevitable dependence of enterprises on Information Technologies (IT), has put organizations under the constraints to achieve their business objectives by complying with the external regulations. Therefore, to successfully manage Information Communication Technology (ICT) projects, a proper Project Governance (PG) culture should be adopted which refers to a set of policies and processes for projects delivery. However, to ensure the alignment of ICT projects with the enterprise business needs as well as to guarantee project value delivery, only PG culture is not enough, but the IT Governance (ITG) components should also be implemented as the umbrella for the enterprise's approach towards IT project management success.

For many years, ICT projects success was assessed by time, cost and quality indicators. However, in the era of PG and ITG, the project success definition goes far beyond these metrics. The literature review discussed in the thesis indicates that the companies with effective PG have a better performance and value delivery. The main purpose of this research is to find the answer on the question "*What can be done to improve the Project Governance?*" within the sample organizational business unit by identification and analysis of the main ITG and PG factors that influence project management process. The obtained findings will be used to find a suitable framework to help to improve the PG with the focus on the ITG and PG key aspects.

The research first explains the core concepts of ITG and PG and provides the most relevant standards and frameworks. The benefits and challenges of the best practices are described to highlight their different objectives. Then, the case study is performed in a sample department and a holistic method of ITG and PG main aspects evaluation is applied. The main deliverable of this approach is the analysis of the relationship between the current issues in project management activities and the level of adoption of ITG and PG aspects. Based on the results, the intention is to find the best way to improve the PG within the chosen department.

After the PG and ITG main aspects are evaluated and the research findings are analyzed, the most suitable framework is chosen with the consideration of the department's environment and business context. COBIT 5 framework is recommended to be applied at the highest level of PG to improve the project management activities. This decision was made because COBIT 5 is based on the IT process model and can be tailored to individual needs of the chosen department. Finally, the BAI01 Manage Programmes and Projects process implementation is conducted, intended to improve the ITG and PG aspects and the overall project management process within the sample business unit.

Keywords

Project governance; IT governance; project management; COBIT 5; stakeholder management; strategic alignment; performance measurement; value delivery; risk management; portfolio management; resource management.

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1. INTRODUCTION

1.1. Background

In today's business world with the rapid growth of Information Technologies (IT) and in the age of massive integration of IT systems and their alignment with business, the importance and the value of Information and Communications Technologies (ICT) is not doubtful. Looking for the most effective ways to maintain competitiveness on the local and global markets as well as to be able to obtain maximum value of their information systems, each year enterprises spend huge amounts of money on their ICT projects and IT services. Interestingly, Gartner analysts have projected IT projects spending of \$3.7 trillion in 2018, representing 4.3% increase compared to 2017 spending (Gartner, 2017).

Nevertheless, notwithstanding multiple benefits that IT brings to the business, IT projects delivery remains to be one of the major problems. Over the last decades, project success has been measured by meeting the time, cost and quality targets. However, in today's world, an ICT project success definition goes far beyond these indicators. The reasons of project management failure have been studied each year over the last decades. The Standish Group is one of the researchers, which provides yearly CHAOS reports, focusing on the project failure statistics and reasons. In the 2015 report, CHAOS has assessed 50000 software development projects worldwide. The results have shown that 19 % of projects were cancelled before the completion or have never been implemented, 52 % were challenged, meaning that projects were delivered but not on time, on budget or not all of the requested features were implemented, and only 29 % of the software development projects were successfully implemented (The Standish Group, 2015).

As ICT investments increase, enterprise-wide adoption of project governance (PG) best practices as well as IT governance (ITG) frameworks has become crucial to ensure effective project execution that links to business strategies. Organizations implement different standards to achieve flawless project performance as well as attain business excellence. Project governance world has developed many different frameworks, to enable organizations to control and monitor projects that are oriented on execution of strategic goals. Adequately adopted PG and implementation of the appropriate PG processes help the enterprises to achieve their goals and represent fundamental factors to bring competitive advantage. Therefore, within the scope of the current thesis, the researcher will look into PG and ITG aspects that influence the achievement of business goals through ICT project management activities and will find the best standards and frameworks that will help the sample organization to improve its PG.

1.2. Motivation

The importance of ITG and PG, which ensure the enterprise business objectives are met through effective implementation of IT projects, has become a top agenda nowadays. Seeking for the ways to improve ICT project management practices and reduce project failure chances, enterprises implement different project governance frameworks. Properly implemented information systems increase companies' performance, boost their productivity and provide competitive advantage in the global market.

Despite the fact that enterprises adopt different project management practices, many of them fail to realize the relationship between the success of their ICT projects and the key concepts of the PG and ITG. Therefore, the researcher expressed her interest to address project governance problems in one of the business units of one of the largest companies worldwide. She defined her main research question as *"What can be done to improve the Project Governance?"* and decided to identify the factors that influence the effectiveness of project management activities and to find a comprehensive project governance approach to add value to the business. This case was selected deliberately, as notwithstanding that the chosen company is the leading company in the global market, many of its business units lack proper approaches in IT project management. The sample company has evolved rapidly over the last decade and many organizational divisions have been created upon an immediate necessity to support the business. The business unit where the case study takes place was also created ad-hoc. Therefore, it experiences underdeveloped project governance culture with inappropriate project management activities.

Moreover, the choice of the research topic represents a learning opportunity for the researcher, who is extremely interested in the ITG and PG frameworks. There is a high demand of professionals who possess the knowledge of ICT project management success aspects as well as have a good understanding of the benefits of ITG and PG standards, which help the organizations to avoid the risk of failure to achieve their goals. Therefore, the researcher believes that this diploma thesis would provide a good practical experience for her future career.

1.3. Objectives of the Thesis

Based on the motivation presented above, the main goal of the current diploma thesis is to examine the current level of adoption of the main PG and ITG aspects in the chosen business unit of the sample organization and perform the critical analysis on how these factors influence department's project management activities. Based on the research findings, the researcher will provide necessary recommendations how to enhance the efficiency of the PG focusing on the improvement of the ITG and PG key aspects. Adoption of a framework, suitable to the chosen department's environment, will be proposed.

The main purpose described above has the following objectives for the theoretical and practical parts of the current thesis:

- The goal of the theoretical part is to give a comprehensive understanding of the various governance and management concepts and various definitions of the governance and management. It will also describe the major aspects of the ITG and PG. Widely recognized best practices and frameworks will be defined to give the reader a good idea on the benefits and challenges of each standard.
- The objective of the practical part of the thesis is to conduct a case study in a sample department by assessing the extent of the adoption of the main aspects of ITG and PG identified in the theoretical part. The relationship between the perception of the ITG and PG factors and the ICT project management activities in the selected department will be analyzed. Recommendations will be provided on the implementation of the best suitable approach to help the chosen department to improve the project governance. With a focus on the latest version of Control Objectives for IT and related Technology (COBIT) framework from the Information Systems Audit and Control Association (ISACA), the researcher will help the company to find the best way how to manage their projects and programmes taking into consideration the ITG and PG main factors.

1.4. Implication

By conducting the current case study, the researcher wants to contribute to the improvement of the project management activities within the chosen organizational unit and boost its performance. With provided recommendations on the adoption of the suitable framework, the long-term expectation of the work is to help the company to be able to:

- Successfully manage ICT projects
- Track project performance at any time of its implementation
- Better align IT systems with business strategy
- Minimize IT-related risks
- Optimize and adequately utilize resources needed for IT solutions
- Ensure business value delivery.

1.5. Research Methodology

Overall, the research methodology applied within the current thesis represents a case study and focuses on the qualitative approach by interviewing the target respondents. A

detailed research design approach will be discussed in the Chapter 3. The structure of the used research methodology is mapped in the figure below:

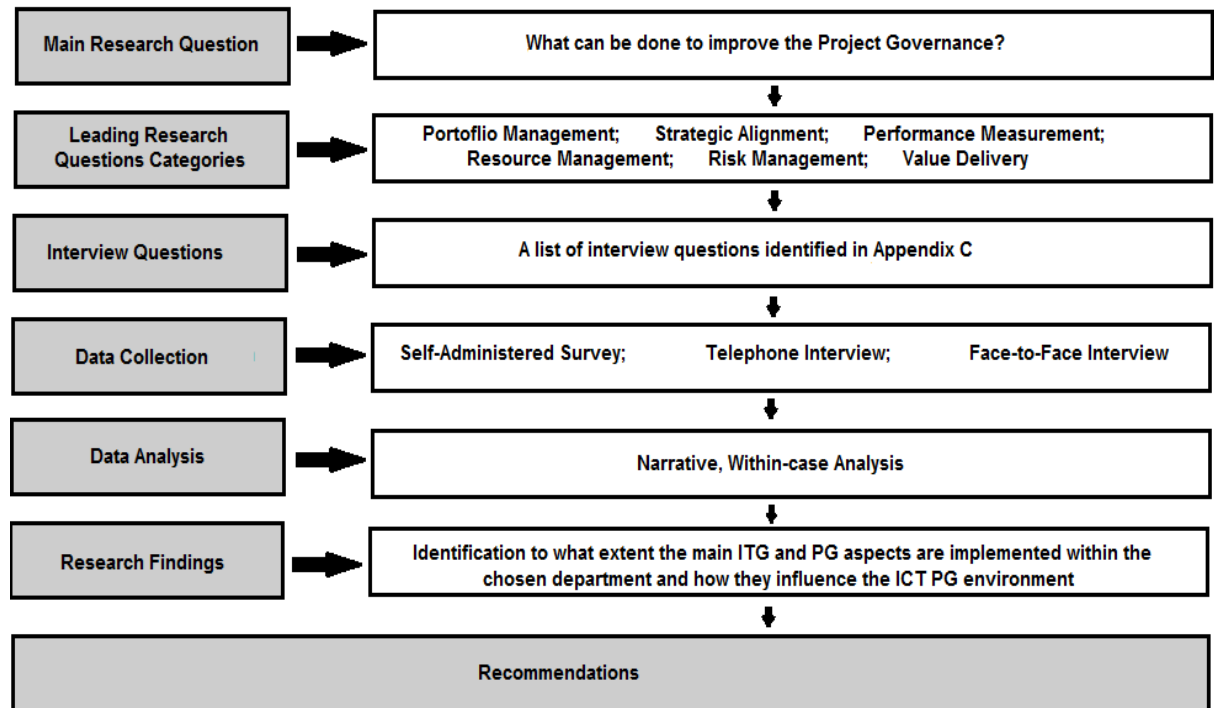


Figure 1: Research Methodology Applied within the Current Thesis (Source: Author)

1.6. Thesis Structure

The current thesis consists of five chapters and its structure follows the logical steps starting by research introduction and analyzing the theoretical background of the main topic. Later, research methodology is defined, which is followed by the case study. Finally, recommendations and conclusions are made based on the case study data analysis.

- Chapter 1: The Introduction chapter provides the background of the topic and highlights the PG problems. Later, motivation and objectives of the thesis are discussed following by the research implication. Further, an overview of the research methodology is given, which will be discussed in details in Chapter 3. Finally, thesis structure is provided to guide the readers.
- Chapter 2: The Theoretical Background chapter presents the literature review on different meanings of governance and management. The major factors of ICT projects failure and success are also provided. In addition, various PG and ITG aspects and frameworks are described, which allow organizations

to enhance their PG and ITG culture. Benefits and challenges of ITG and PG best practices are discussed.

- Chapter 3: The Research Methodology chapter explains the research methods applied in this thesis. The selection of the main research topic is discussed and the main research topic is defined: *“What can be done to improve the Project Governance?”* The case study strategy is chosen and a qualitative approach is applied within the research. Research questions are identified to be used in semi-structured interviewing method. Some requirements are set to select the interviewees. For data collection self-administered survey, telephone interview, and face-to-face recorded interview will be performed. Later, the collected data will be analyzed and recommendations will be provided on how to improve the project governance within the selected department.
- Chapter 4: The Case Study chapter describes the company profile and focuses on its existing problems in project management. The chapter later discusses the interview preparation process and data processing methods. After the actual interview, the collected empirical data is categorized into ITG and PG key aspects. The research findings are later analyzed and the answer to the main research question is derived with the assistance of the ICT manager of the chosen sample business unit.
- Chapter 5: The Recommendations and Conclusions chapter recommends the sample department a suitable approach to improve its PG based on the examined ITG and PG aspects. To improve the factors that influence successful PG culture within the case department, COBIT5 framework and its BAI01 process implementation is advised. To provide a strong business case for the BAI01 process adoption, its capability level is assessed and presented to the leadership. When the BAI01 implementation approval is obtained, the process is tailored to the department environment and actual adoption phases are scheduled. Finally, the chapter provides existing limitations of the research and future development opportunities. The conclusion section concludes the thesis.

A full list of abbreviations, figures, tables and references used within the thesis are included at the end of the thesis.

2. THEORETICAL BACKGROUND

“When looking at a nail and a screw, one has to know the existence of the hammer and the screwdriver to choose the right tool. But in order to bring the best value, depending on the situation, one has to master both tools. If one has only a hammer, everything looks like a nail, which is a reductive vision of the world. The more one masters the right tools, the bigger and the richer the world becomes” (L. Renard, 2016).

In order to provide a better understanding on the chosen topic, the theoretical background covers the major concepts of the domain. This chapter starts with the definition of the governance and its characteristics. Section 2.2 describes enterprise governance (EG) and further elaborates on its dimensions: corporate governance and Information Technology governance (ITG). The section covers the main challenges of both concepts and focuses on the key areas of the successful ITG. Later, the chapter provides the project governance (PG) definition and its main concepts, which are essential to successfully maintain the PG in the organization. Section 2.4 discusses the P3 governance - the governance of projects, programs and portfolios and later elaborates on the management of these fundamentals and their relationship. Section 2.5 interprets the difference between the governance and management aspects, while Section 2.6 discusses the project governance roles. To explain the existing issue with the implementation of IT-related projects, Section 2.7 outlines the major causes of IT project delivery failures as well as elaborates on the factors ensuring success of IT initiatives. Section 2.8 describes existing PG standards and ITG frameworks, which can help organization to improve the level of PG and ITG. This section provides benefits and challenges of each of the best practices as well as guidance for implementation of COBIT5 is discussed. Lastly, Section 2.9 draws conclusions for the theoretical background.

2.1. What is Governance?

For the last decades, the interest in governance has rapidly grown. Scandals in notorious companies such as ENRON, Tyco International, and WorldCom, have shown the importance of appropriate governance to enable organization to timely identify potential risks. The failures of the companies mentioned above and the need for stakeholders' assurance have spawned the development the first model of governance - the Sarbanes-Oxley Act (SOX) (R. Müller 2009, p.1). It became obvious, to maintain competitive position in the market, organizations in today's world should be able to respond to rapid environmental changes with flexibility as well as be able to adapt to real-time conditions

in a timely manner. Moreover, the compliance with governmental policies and external regulations should always be considered.

So what is the governance? The term *governance* is used massively nowadays. However, its concept is not new. The word governance comes from the Latin word “gubernare” and means the verb “to steer”. To describe a “good governance” model the United Nations have introduced eight major characteristics that play a pivotal role while determining organizations functions (UNESCAP, 2009):

- **Participation** – it is a key element of good governance, which ensures freedom of expression and implies everyone’s commitment;
- **Rule of law** – governance obliges to follow fair legal frameworks;
- **Transparency** – assures that data is provided in the understandable form and is accessible to all involved parties;
- **Responsiveness** – implies that all stakeholders should be informed in a timely manner;
- **Consensus oriented** – ensures that all involved parties are considered and the final decision meets the interests of each and every one;
- **Equity and inclusiveness** – implies that all involved members have equal opportunities and rights in decision making;
- **Effectiveness and efficiency** – good governance implies the results meet the needs by sustainable usage of provided resources;
- **Accountability** – depending on the organizational structure, accountability varies. In general, the accountable person is responsible for his actions and must be able to provide a satisfactory reason for it.

Ralf Müller (2009) has summed up all the explained above characteristics of good governance, describing it as the following:

“Governance provides a framework for ethical decision making and managerial action within an organization that is based on transparency, accountability and defined roles. It also provides a clear distinction between ownership and control of tasks. It sets boundaries for management action, by defining the goals of the organization and the means by which they should be attained, as well as the process that managers should use to run their areas of responsibility” (R. Müller, 2009, p.2)

2.2. Enterprise Governance

There is significant evidence to suggest that enterprises with better governance have higher chances to attract investors. With better governance, stakeholders are ensured in high performance of the enterprise. Therefore, it is essential to identify which aspects or characteristics enable an organization to be a high performing organization. Bharat

Vagadia (2014, p.3) has identified seven pillars organizations need to be able to thrive in today's world:

- **Accountability** – eliminates “us-versus-them” attitude and is the half-the-battle of the successful organization;
- **Awareness** – refers to the ability to recognize the signals suggesting the needs for adjusting;
- **Agility** – assures the ability to customize, successfully react to market conditions;
- **Adaptability** – ensures the organization adapts its business model to the required environmental changes;
- **Alignment** – implies a permanently aligned operational layer with organizational strategy;
- **Action** – refers to certain visible actions and tracks these actions ensuring the objectives are met;
- **Achievement** – refers to knowledge acquisition and translates all gathered experience into a competitive advantage.

These indicators assure the enterprise's ability to succeed and compete. However, to drive the organization to high performance, conformance to all of the mentioned elements is not enough, but a certain culture of governance is needed – enterprise governance. Enterprise governance can be described as an enterprise control, direction and performance regulating structure. This term generalizes both corporate governance and business management within the organization. The Chartered Institute of Management Accountants (CIMA) and the International Federation of Accountants (IFAC) define enterprise governance in the following way:

“The set of responsibilities and practices exercised by the board and executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that the organization's resources are used responsibly” (CIMA/ IFAC, 2004, p.10).

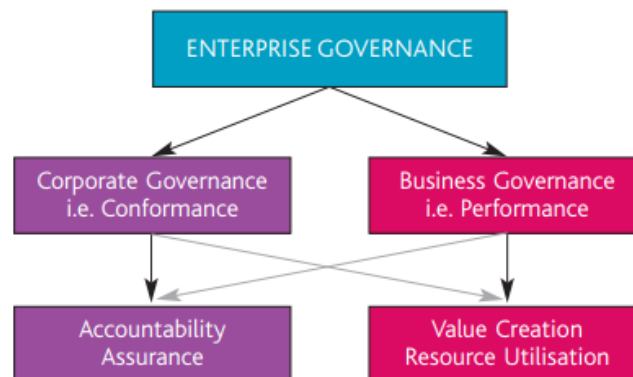


Figure 2: Enterprise Governance Framework (Source: CIMA/IFAC, 2004, p.10)

Figure 2 visually represents the enterprise governance idea, where conformance refers to the historical approach and performance dictates the importance of the strategy. The main focus of conformance is enterprise legislation and regulations. A significant addition to enterprise represents the performance dimension. The latter aspect is considered as prospective direction and helps the board to focus on strategic decision-making. In the era of competitive coexistence, organization cannot become successful satisfying only conformance part. It is essential to maintain a good balance between conformance and performance. These two dimensions will be described in the following sections.

2.2.1. Corporate Governance

Conformance, or also called corporate governance, represents a collection of rules, practices, and strategies by which the board of directors control and direct the organization, considering the balance of interests of multiple stakeholders. Lately, corporate governance term has become quite ambiguous. In its narrowest sense, corporate governance implies enterprise control, its conformance to regulations, best practices and accountability (CIMA/ IFAC, 2004).

The Organization for Economic Cooperation and Development (OECD) (2004) defines corporate governance as:

“Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined. Good corporate governance should provide proper incentives for the board and management to pursue objectives that are in the interest of the company and shareholders and should facilitate effective monitoring, thereby encouraging firms to use resources more efficiently” (OECD, 2004, p.11).

This definition underlines two major characteristics of corporate governance: it highlights the importance of clearly defined roles in the enterprise and emphasizes on identified responsibilities. Also, a large part of the governance culture is communication, which implies working closely with internal and external key stakeholders and the ability to communicate to the whole team about the organizational objectives at any given time and during an ongoing project.

Since the early 2000s, corporate governance has been a sensitive topic in the business sphere. It became clear that when the corporate governance is implemented thoughtfully, it prevents and secures the enterprise from corporate scandals, providing enough information to avoid the possibility of enterprise collapses, such as One.Tel company failure.

One.Tel was a net of Australian telecommunications companies and the fourth largest telecom company before it collapsed in 2001. Investigations have shown that the main reason for the failure was the IT department. Although the company had invested a huge amount of money in IT department, and which was performing well, the cause of the

fiasco was the insufficient quality of information management. One.Tel IT department lacked the integration and cooperation with the other structures within the enterprise. There was no defined alignment between organizational IT department and business strategy, which resulted in underutilization of IT resources, intended to enhance business process performance (P. Barry, 2002).

One.Tel example shows how business dependency on IT led to the fact that corporate governance could no longer cope with the issues without involving IT. This situation underlines the direct link between corporate governance and IT governance. Information technology governance provides valuable input into business strategy and allows the enterprise to take the full advantage of its possibilities. Therefore, it has become a the major driver for corporate governance.

2.2.2. IT Governance

IT is directly related to the performance dimensions of the enterprise governance as it supports all business processes by delivering automated services and has a pivotal role in business transformation. With the increasing importance and significant value that IT provides to the success of enterprises, the implementation of IT governance (ITG) has become almost obligatory. Enterprise IT dependency implies a huge vulnerability and if managed properly, plays a key role in the enterprise success.

The Global Technology Audit Guide (GTAG) 17 in its “Auditing IT Governance” (2012) publication cites IT governance description provided by the International Professional Practices Framework (IPPF):

“IT governance consists of the leadership, organizational structures, and processes that ensure that enterprise’s [IT] support the organization’s strategies and objectives”.

This definition underlines that IT governance implies IT operations and IT management to guarantee the alignment between both activities as well as the needs of the enterprise defined in the strategic plan. GTAG means the following describing the proper alignment between information technologies and enterprise strategies:

- The management of the enterprise has a clear understanding of IT limitations and potentials;
- IT realizes the enterprise needs and objectives;
- Enterprise needs and objectives are applied and supervised throughout the enterprise by the appropriate governance structure and accountability.

All the mentioned above aspects emphasize that the IT governance success is gained when enterprise goals and objectives are aligned with the enterprise needs and IT is capable of meeting those needs collaborating with the managers.

These are several more definitions for IT Governance available in literature:

“IT Governance is the responsibility of the Board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization’s IT sustains and extends the organization’s strategy and objectives” (ITGI, 2003).

“IT Governance is the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT” (Van Gembergen, 2002).

Both IT governance definitions are focused on the IT alignment with business strategy. ITG assures that maximum business value is achieved through the development and implementation of successful IT projects. Broadly speaking, ITG is adapted to IT management and control improvement primarily for stakeholders’ benefit. To gain all advantages of ITG, it is important to follow IT governance culture, which provides five key areas for successful IT management and control (ISACA, IT governance, 2006, p.6):

1. **Alignment** – implies the strategic alignment between IT and business processes, ensuring that IT possibilities are efficiently utilized to assist business processes;
2. **Value Delivery** – focuses on optimization of investments and return on investment (ROI) assessment. Also, assures that IT resources and IT projects are managed properly, in a timely fashion and within the budget;
3. **Risk Management** – refers to IT assets security and ensures that disaster recovery plans are created;
4. **Resource Management** – provides high-level management to IT resources, IT funding and assures enterprise has adequate capabilities to support current and future business processes;
5. **Performance Management** – focuses on project deliveries and measures business values;

The overall purpose of IT governance is to identify the existing problems and acknowledge the importance of IT in business strategy. It ensures that the enterprise is capable of supporting its operations and is ready to implement new IT systems to remain competitive and successful. The goal of IT governance is to assure that all IT expectations are met, resources are managed and optimized, potential risks are mitigated, and projects acceptance criteria are measured.

Nowadays, there are four widely recognized IT governance frameworks that seem to be at the forefront:

- **COBIT** – the Control Objective of Information and related Technologies – an IT governance control framework which helps enterprises to deal with risk management, business challenges and aligns enterprise goals with IT strategy;
- **ITIL** – the Information Technology Infrastructure Library – is a library of the best practices for IT service management processes and its goal is to improve service

efficiency. ITIL represents IT as a business service partner rather than just back-end support;

- **ISO 20000** – the International Organization for Standardization – IT service Management standard that enables IT organizations to ensure that their ITSM processes are aligned both with the needs of the business and with international best practice;
- **ISO 27002** – the International Organization for Standardization - is a global best practice standard for enterprise information security management.

To meet increasing needs of enterprises in IT systems and controls, IT governance aspect continues its evolution. COBIT is one of the broadly recognized IT governance frameworks and is a perfect example of continuous improvement (Figure 3). It helps organizations to adapt to the changing business needs and emphasize the value of IT as a business enabler.

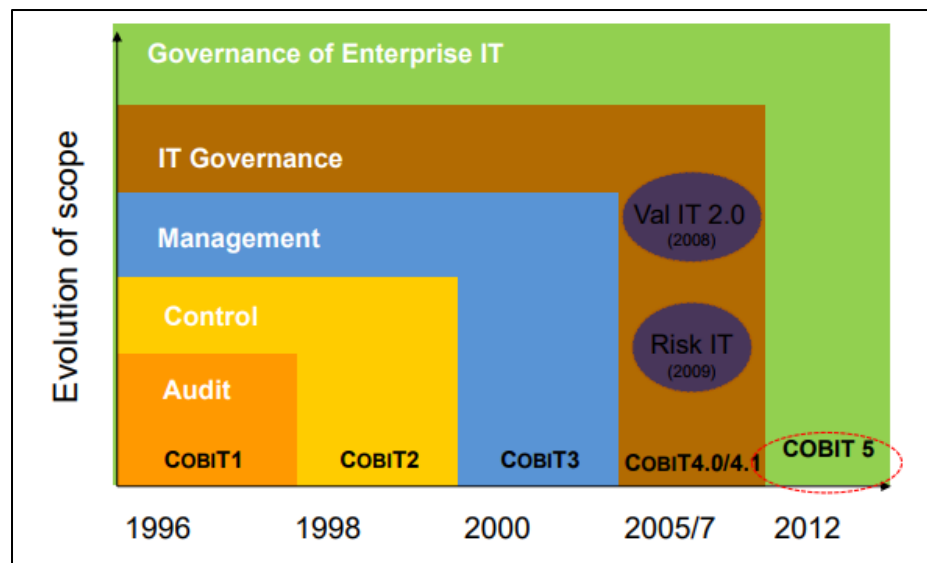


Figure 3: COBIT Evolution (Source: ISACA, 2012d)

The last version of COBIT – COBIT 5 – is considered as the most significant evolution of the IT governance framework. Considerable developments have been made in the COBIT 5 version to place it as a model for the corporate governance of IT. The most important change in COBIT 5 is the restructuring of the framework from being an IT process model into an IT governance framework with a set of IT governance practices, a management system for continuous improvement of IT activities and a process model with baseline practices (ISACA, 2012c).

Moreover, while working on the COBIT 5 version, experts realized the importance of Val IT and Risk IT frameworks principles, responsible for the generation of business value from IT investments and IT-related risks management respectively. Experts have

integrated both frameworks principles into COBIT 5 as they found that principles are easy for enterprises to understand and follow as well as allow more effective value delivery. Apart from Val IT and Risk IT integration, the move from COBIT 4.1 to COBIT 5 has undergone other changes in frameworks content that impact Governance of Enterprise IT (GEIT) implementation and improvement. The changes include (ISACA, 2012e):

- New GEIT Principles
- Increased Focus on Enablers
- New Process Reference Model
- Control Objectives Updated
- New and Modified Processes
- Practices and Activities
- Goals and Metrics
- Inputs and Outputs at the Practice Level
- Expanded RACI Charts with Business and IT Roles
- Process Capability Model

COBIT 5 will be described in more details in the COBIT 5 chapter.

2.2.2.1. ISO 38500

In addition to COBIT, ITIL, ISO 27000 and ISO 27002 standards, some publications also underline Committee of Sponsoring Organizations of the Treadway Commission (COSO), PProjects IN Controlled Environments (PRINCE2) and Project Management Body of Knowledge (PMBOK) frameworks as significant parts of IT governance framework. One more significant standard to describe is the International Organization for Standardization 38500 - ISO 38500 - is the official corporate governance of IT standard. Its goal is to deliver principles for board members, directors, and senior executives (Calder, A. 2008). Admittedly, as all ISO standards are reviewed every five years to establish is the standard is relevant for the marketplace, ISO 38500 was updated in 2015 (ISO, 2015).

ISO 38500 guideline assists high-level managers in effective IT governance and helps them to accomplish their legal, regulatory and ethical obligations while using IT. ISO 38500 is applicable to all types and size organization regardless of purpose or ownership structure. The model of the standard implies IT governance through three main tasks (Sylvester, D. 2011):

- Evaluate the current and future IT usage;
- Direct preparation and implementation of plans and policies to ensure that the use of IT meets business objectives;
- Monitor conformance to policies and performance against the plans.

Moreover, the standard has six principles for good IT governance, which define a proper behavior to guide decision-making. The principles are (Moeller, R., 2013):

- **Responsibility** – this implies business managers’ responsibility for business use and performance, including IT-enabled projects;
- **Strategy** – defines IT direction aligning IT activities with business goals;
- **Acquisition** – refers to IT acquisition, which is made for valid reasons and based on appropriate and ongoing analysis with transparent decision making;
- **Performance** – underlines the purpose of IT to support the enterprise providing proper services to meet business requirements;
- **Conformance** – indicates IT conformance to all compulsory regulations and legislation with clearly defines policies;
- **Human Behavior** – refers to demonstrated respect by IT policies and decisions to all involved process parties and IT users.

These principles identify what should happen, however they do not define how, when or by whom they should be implemented. These factors depend on the type and nature of the enterprise implementing the principles. Each of the principles is then applied to the Evaluate – Direct – Monitor model to provide the best practice for each principle (Figure 4).

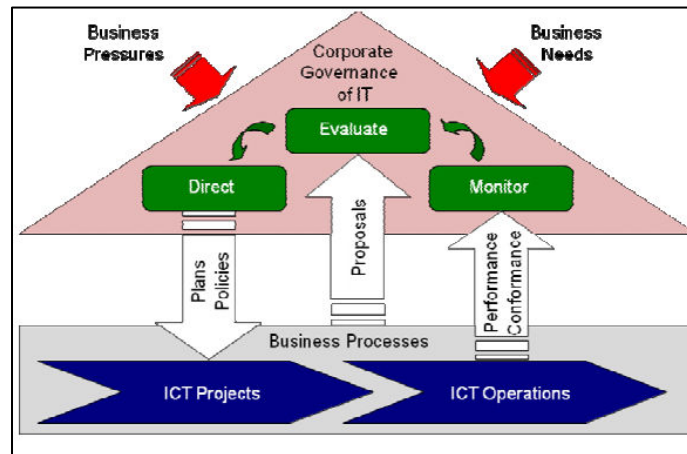


Figure 4: ISO 38500 Model of Corporate Governance of IT (Source: ISO, ISO/IEC 38500:2008, Switzerland, 2008, cited by Sylvester, D. 2011)

2.3. Project Governance

Apart from using corporate governance and IT governance, enterprises should have a similar approach to running the projects. Successful projects demand a methodical approach to planning and execution to be able to deliver benefits just-in-time and without budget overruns. This approach is referred to as Project Governance (PG).

Project governance is an extension of corporate governance principles, which can be identified as the management of individual projects through governance structures at the

business level (IODSA, 2015). Effective project governance deals with the problem of doing the right projects and getting them right. Doing the right project refers to doing the projects which goals are aligned with enterprise objectives, while doing the projects right implies effective management of project processes ensuring the benefit delivery to stakeholders (David L. Pells et al., 2012).

Project governance refers to the practices that must be in place for project success and it should not be confused with project management. Project management is essentially concerned with ensuring that the implementation is done within the planned time frames and within budget without sacrificing any of the key requirements, including quality, training and ensuring the defined coverage in terms of functionality and locations (V. Svatá, 2015).

To implement a successful enterprise project governance (EPG), the enterprise must have project management fundamentals in place. David L. Pells et al. (2012) identify four categories for effective EPG:

- **Governance** – this refers to the establishment of portfolio, program and projects management policies, as well as corporate governance alignment with stakeholders need. Project governance also means efficient usage of best project management practices as well as criteria and metrics identification and project activities support.
- **Competency** – this category controls the alignment of project management scope with existing enterprise competency models. Career development, corporate training, coaching, mentoring and other educational activities are important aspects of project governance and project performance improvement.
- **Processes** – this category ensures that modern technologies and methodologies are used to make EPG effective. It also involves information systems and automated tools to speed up management of multiple projects and ensure cooperation while managing multiple projects. An important element of this category is project management maturity assessment and project management approaches continuous improvement.
- **Culture** – this category implies the development of project management culture to make enterprise project governance a part of the whole enterprise. To guarantee project management approach and practices are spread across the project management professionals, significant changes need to be made. Therefore, change management is a highly recommended practice to simplify the transition from operational culture to dynamic project management. Important aspects of project management culture are knowledge management, ability to use project management best practices, experience and capability to develop from the lessons learned.

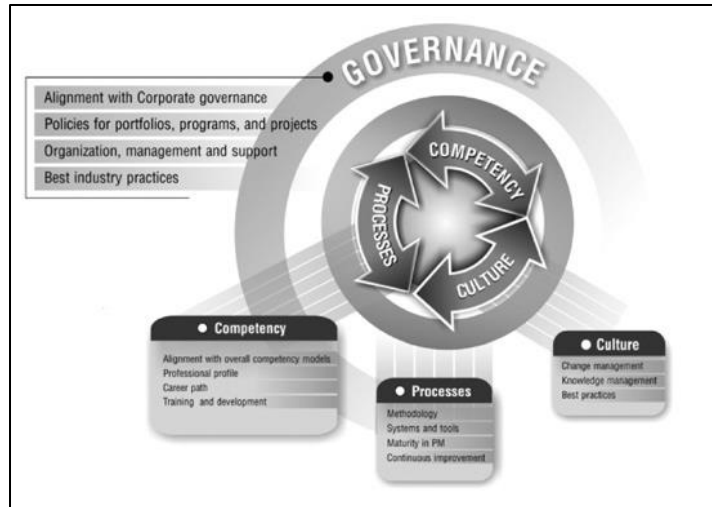


Figure 5: Enterprise Project Governance Organization (Source: David L Pells et al., 2012)

After implementation of PG in the enterprise, it is important to follow certain aspects to successfully maintain enterprise project governance. These aspects are EPG components, which ensure effective project governance culture (Figure 6).

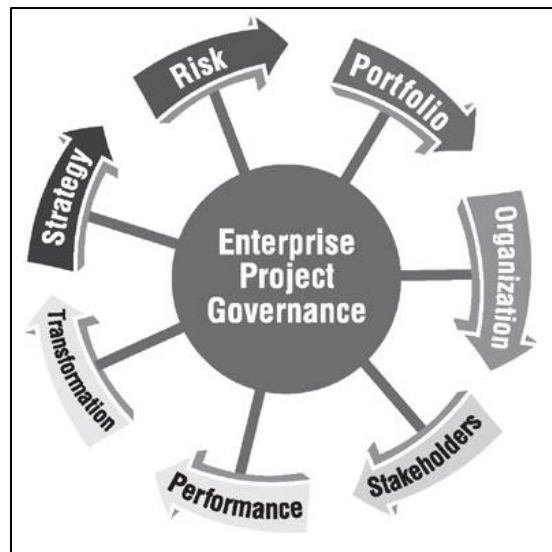


Figure 6: Project Governance Components (Source: Source: David L Pells et al., 2012)

The EPG components are (David L. Pells et al., 2012):

- **Strategic Alignment** - this component ensures that projects are consistent with enterprise strategies and goals. Strategic alignment activities control all project investments, resources, and finances adequately. If the project is mandatory for the enterprise, the decision is focused on the required standards management with

minimum risk. On the other hand, if the enterprise has discretionary projects, the decision to undertake the project or not is made upon thorough assessment whether the project supports the enterprise objectives and whether project investments will result in better benefits compared to alternative projects.

- **Risk Management** - enterprises need to have risk management activities in place to analyze possible risks in a timely manner and balance potential profits against potential losses. Risk Management represents a preventive measure to avoid expensive mistakes rather than a reactive.
- **Portfolio Management** - enterprise project portfolio enables managers and stakeholders to have a broader view of all individual projects and deeper understanding of the enterprise direction as a whole. Enterprises can create a single project inventory including all the ongoing and proposed projects. Alternatively, different departments can create their own project portfolios and include only department-specific projects. Having one project portfolio or many depends on the enterprise structure and size.
- **Organization** – emphasizes on the leadership commitment and support, crucial for successful project governance. However, this is not the only necessary aspect, and appropriate enterprise structure with well-defined roles and responsibilities is required. The three main project governance roles are executive leadership, portfolio management team, and program/project managers. To make PG successful, the directing roles and the roles that oversee PG activities should be organized. Moreover, these roles should cooperate with each other to ensure the project governance decisions made have clear sources and directions. Apart from the PG roles, enterprises need committees operating at different levels. The structure of committees depends on the enterprise nature.
- **Stakeholder Management** – this underlines the fact that project stakeholders have a vested interest in project outcomes, therefore, for a better stakeholders management, it is important to identify stakeholders in early stages. Moreover, it is crucial to understand that stakeholders will not support the project unless they are accurately informed about the project progress and challenges the PG team is facing. Thus, project governance goal is to create a trustful environment between the project team and stakeholders.
- **Performance Evaluation** – this component is responsible for the periodic project governance performance measurement and monitoring to make the process effective and ensure it supports business strategies and is responsive to the changing environment. Generally, the performance is assessed during project execution.
- **Business Transformation** - this concept must be an ongoing requirement for any enterprise as business vision and strategy should always be adapted to the global economic market and be refined to avoid negative impact. The business transformation should be considered as a project governance structure, since the

ability of the enterprise for business transformation represents the real measure of the corporate success. Moreover, proper change management is a significant aspect of the project change. It also ensures the customers to optimize their performance in response to changing demands.

Project governance is vital in the modern IT society as IT-supported business projects play the fundamental role in enterprise ability to compete in the global market. It is important to understand that while successful IT projects help the enterprise to maintain the leading position, failed projects will result in significant loss of customers trust in the company. Effective project governance ensures that all project activities are aligned to the organization's strategic objectives and that those are delivered efficiently. Ross Garland has defined project governance as the following:

“Project governance – the process of project decision making and the framework, models or structures that are established to enable this – is recognized as critical success factor for the delivery of projects” (R. Garland, 2009, p.1).

This definition explains effective project governance as the way of implementing complex IT projects, guaranteeing the expected value delivery. Enterprises, where the majority of business activities are being done through projects, are too vulnerable to project failures. This is why a proper governance framework should be developed within the enterprise. Appropriate project governance increases the probability of better ICT projects controls in times.

The Association of Project Management (APM) describes governance in the following way:

“Governance refers to the set of policies, regulations, functions, processes, procedures and responsibilities that define the establishment, management, and control of projects, programs and portfolios” (APM, n.d. a).

APM focuses on the holistic approach – projects, programs and portfolio management to achieve strategic goals. This approach is also known as P3 governance. Section 2.4 will explain P3 governance further.

2.4. P3 Governance

Even in today's world with the rapid growth of information technologies and in the age of systems integration and their alignment with business, when speaking about project governance, the great majority of people (sometimes even chief executive officers) have no understanding of its direct dependency with project, program¹ or portfolio management.

¹ The Researcher: *Program* is used in American English, while in British English *programme* is preferred spelling. Within the current thesis, the researcher will use American variant only. (<https://en.oxforddictionaries.com/definition/programme>)

In this section, P3 governance will be discussed - the governance of projects, programs and portfolios.

The governance of portfolio, program and project represents a significant part of enterprise governance. The advantages of good P3 governance is the improvement of the frequency and the level of success delivery, as well as investment optimization and failure avoidance. The APM identifies the following ways to demonstrate good governance (APM, 2012, p.8):

- The adoption of a disciplined life cycle governance that includes approval gates at which viability is reviewed and approved;
- Recording and communicating decisions made at approval gates;
- The acceptance of responsibility by the organization's management board for P3 governance;
- Establishing clearly defined roles, responsibilities and performance criteria for governance;
- Developing coherent and supportive relationships between business strategy and P3;
- Procedures that allow a management board to call for independent scrutiny of projects, programs and portfolios;
- Fostering a culture of improvement and frank disclosure of P3 information;
- Giving members of delegated bodies the capability and resources to make appropriate decisions;
- Ensuring that business cases are supported by information that allows reliable decision-making;
- Ensuring that stakeholders are engaged at a level that reflects their importance to the organization and in a way that fosters trust;
- The deployment of suitably qualified and experienced people;
- Ensuring that P3 management adds value.

As it can be seen, good project governance implies the clarification of the roles, responsibilities and processes as well as the communication between all team members within the organization. These governance aspects apply to all projects of any context or size. Moreover, considering the unique nature of each product, project governance allows using additional ad hoc factors per necessity.

According to APM, the P3 governance structure plays the key role in case of joint venture cooperation among several organizations. In such case, the reporting process is made through the P3 management or the board of directors. It is important because if the enterprise is largely dependent on the project outcome, stakeholders and board of directors involvement is a must. The project stakeholders need to ensure that project is processing considering all agreed conditions, while host organizer board of directors need to control

overall P3 governance process to conform to the agreement. This is illustrated in Figure 7. The cycle of P3 control is known as *project assurance* and should be a part of the host enterprise quality assurance to maintain customers (stakeholders) trust.

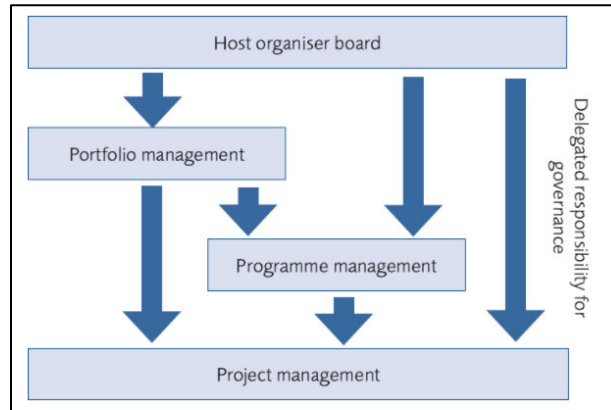


Figure 7. P3 Governance Structure (Source: APM, 2012, p.9)

2.4.1. Project, Program and Portfolio Management

In this section, the fundamental aspects of the project governance will be discussed – project, program and portfolio as well as the relationship between them.

2.4.1.1. What is a Project and Project Management

The Project Management Institute (PMI) in PMBOK (Project Management Body of Knowledge) describes a project the following way:

“A project is a temporary endeavor undertaken to create a unique product, service or result. The temporary nature of projects indicates a definite beginning and end. The end is reached when the projects objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists” (PMI, 2013a).

So, a project has a temporary nature, meaning that once its objectives are achieved by creating a unique product, new system, improvement in the existing system or a service, its existence comes to an end. The term temporary does not intend the short period of time. Due to the specificity of each project, it can last weeks or even centuries, but it will always have a start date and an end date. The core mission, or endeavor, of each project is to generate an outcome. The outcome of the project can be tangible or intangible and is accomplished by the project team within time, cost and other limitations. Also, in a project

there might be engaged a single individual, several teams or even multiple organizations (PMI, 2013a).

Good project management implies the delivery of the agreed project outputs to agreed time, cost, and quality. It is a discipline of planning, motivating, managing and controlling all given resources to achieve the stated goal. The APM defines the project management process as:

“Project Management is the application of processes, methods, knowledge, skills and experience to achieve the project objectives” (APM, n.d. b).

Overall, project management differs from just management process by the fact that it has the ultimate deliverable and has time and budget constraints, while simply management is an ongoing process. Other key aspects of project management include project goal definition, underlying project requirements and defining the final deliverables quality and acceptance criteria, business justification for investment and budget management, project planning, project team leading and motivation, risk measurement, communication with stakeholders, project progress monitoring and project closure.

2.4.1.2. What is a Program and Program Management

A program is a group of multiple similar or somehow related to each other projects (PMI, 2013a). The idea behind grouping projects in programs is to achieve the benefits that are not available while managing them individually. A significant difference between projects and a program is that a program does not certainly have an identified deliverable. Programs bring a huge advantage when projects within the program are properly organized, however enterprise objectives are delivered by each project within the program. In addition, programs have a broader vision, ensuring that the organization benefits from each project activities and not from a certain project sponsor.

These are a couple of program management definitions available in literature:

“Program management is ... the integration and management of a group of related projects with the intent of achieving benefits that would not be realized if they were managed independently” (Lycett et al., 2004, p. 289).

“Program management is the application of knowledge, skills, tools and techniques to program in order to meet the program requirements and to obtain benefits and control not available by managing projects individually” (PMI, 2013a, p. 8).

Good program management links strategic business goals with the running projects. Also, it provides more effective and efficient utilization of resources. Program management ensures that stakeholders and board of directors have overall control over their investments, have a wider view of projects and a more comprehensive reporting process.

2.4.1.3. What is a Portfolio and Portfolio Management

A portfolio is a group of related or non-related projects, programs and sub-portfolios. Many organizations have a single portfolio containing all the programs, projects and sub-portfolios that are performed within the organization. A portfolio can consist only of multiple non-related projects without having a program, as non-similar projects can be managed only within a portfolio. On the other hand, the portfolio can have only one program, which includes multiple related projects (PMI, 2013a).

“Portfolio management refers to the centralized management of one or more portfolios to achieve strategic objectives. Portfolio management focuses on ensuring that projects and programs are reviewed to prioritize resource allocation, and that the management of the portfolio is consistent with and aligned to organizational strategies” (PMI, 2013a, p. 9).

The Office of Government Commerce (OGC) explains portfolio management as:

“Portfolio Management is a coordinated collection of strategic processes and decisions that together enable the most effective balance of Organizational Change and Business As Usual” (OGC, 2008, p.10).

This “most effective balance” is achieved by the fact that changes to business as usual, or, in other words, changes to business operations, are discussed with high-level management. Moreover, all the strategic decisions are made considering budget, risks, impact on business processes and strategic benefits. Any changes are adapted to current resource availability and conditions within the organization. Additionally, change reviews are permanently discussed and assessed according to budget, priorities, timeline, risks and strategic weight (OGC, 2008).

2.4.1.4. Difference and Relationship among Projects, Programs and Portfolios

In the previous sections was described what project, program and portfolio represent. Each of these endeavors has their own specificities and, at the same time, they are all parts of a big project governance picture. In this section, the difference between the terms and the relationship between each entity will be introduced.

To better visualize the differences between portfolio, program and projects, OGC has summarized all key aspects in the following table:

Portfolio	Program	Project
An organization’s total investment (or a segment thereof) in the Changes to meet the Strategic Objectives	A single vision of Change leading to specific outcomes aligned to one or more strategic objective/benefits	A focused delivery of a single output or multiple outputs contributing to a Program vision or directly to a strategic benefit

Permanent (continually changing and aligned to the Strategic Planning process)	Temporary (can last for many years)	Temporary (relatively short-term in comparison)
Ongoing process of prioritizing and aligning the Portfolio to meet Strategic Objectives	High-Level Plans supported by detailed Plans	Project Level Plans with focus on detailed delivery using Stage Plans
Overall strategic perspective of the whole organization	Wide scope that changes over time as requirements and solutions are clarified	Narrow defined scope with (ideally) no change
Office should sit in a Business Change Department, strategy or finance, reporting directly to Management Board	Office should sit in business area affected or in corporate services	Office should sit in business area affected

Table 1. Key differences between portfolios, programs and projects (adapted from: OGC, 2008, p.11)

On the other hand, the relationship between portfolios, programs and projects can be described as (R. Müller and T. Blomquist, 2006):

- The portfolio is a collection of projects and programs within the organization. Programs and projects are not necessarily interdependent;
- The program includes a set of related or similar projects managed in a coordinated way to achieve strategic benefits. A program is a part of the portfolio;
- Projects can be a part of program or independent project, but they are a part of the portfolio

Overall, projects, programs, and portfolios help to accomplish the organizational strategy. R. Müller (2009) has described the link between business strategy and P3 using the following picture:

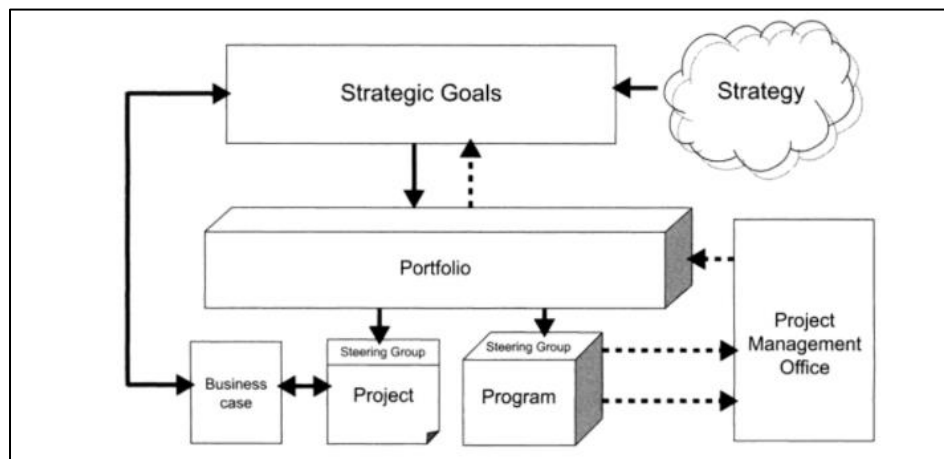


Figure 8: Relationship between Strategy and projects (Source: R. Müller, Project governance, 2009)

In this picture, R. Müller (2009) has identified a delivery circle (solid lines in the picture) and control circle (dotted arrows). In the delivery circle, strategy dictates the goals. These goals become strategic goals for the project portfolios and the projects and the programs that are parts of the portfolio. Each project and each program is governed by the respective steering group, which owns business cases. Business cases, on the other hand, represent organization strategy and identify the scope of projects and programs, which contribute to the strategic goals achievement.

In the control cycle, Project Management Office (PMO) manages the alignment between organizational capabilities and the strategy, moving the information from projects to other organizational structures.

2.5. Difference between Governance and Management

For a better understanding of terms project governance and project management, in this section, the difference between governance and management will be discussed.

With the evolution of the term *governance*, there is a huge confusion while distinguishing it from management. The reason is that both concepts are closely related to each other, although imply different approaches. Van Grembergen and De Haes (2008, p.11) have visually illustrated the difference in concepts of governance and management. In Figure 9, adapted from Sohal and Fitzpatrick (2002), authors describe the governance as “the creation of a setting in which others can manage effectively”, while “management is the making of operating decisions”.

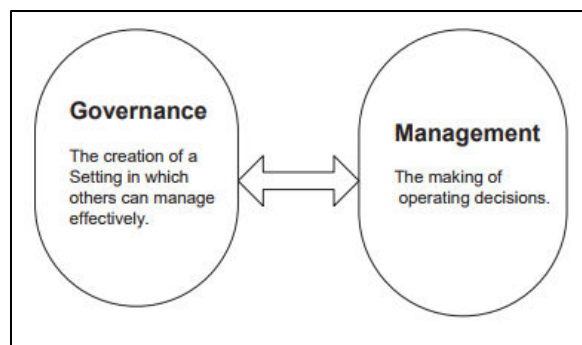


Figure 9: Governance vs Management (Source: Van Grembergen and De Haes 2008, p.11, cited from Sohal and Fitzpatrick, 2002)

Since the main focus of this thesis is Information Systems and Information Communication Technologies, it is necessary to discuss IT governance and IT management differences. The major concern in IT governance is the link between IT and present and future business strategies. According to Figure 10, provided by Van Grembergen and De Haes (2008), the area of IT management is focused on the management of present and

internal business strategies. IT governance, on the other hand, has a wider view and emphasizes on the transformation of information technologies' capabilities in a way to enable delivery of future business demands.

“This does not undermine the importance and complexity of IT management, [...] but whereas elements of IT management and the supply of (commodity) IT services and products can be commissioned to an external provider, IT governance is organization specific, and direction and control over IT cannot be delegated to the market. (Peterson, 2003)” (Van Grembergen and De Haes 2008, p.11)

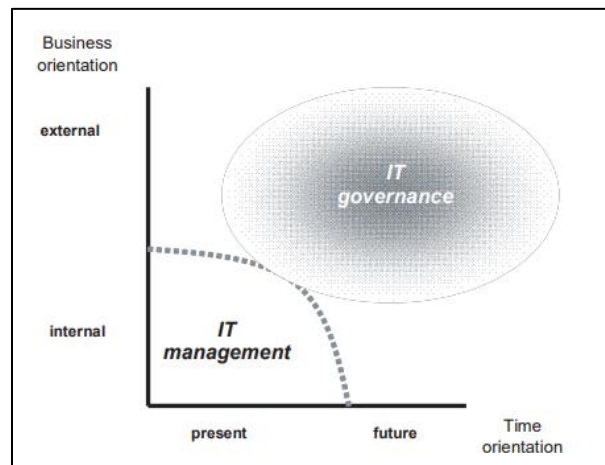


Figure 10: IT governance and IT Management (Source: Van Grembergen and De Haes 2008, p.10, cited from Peterson, 2004)

The governance concept can be interpreted as an ongoing activity, which copes with internal and external business processes. By governance implementation, the enterprise will have the vital link between existent processes and future business strategies and objectives. Also, it has a broader influence on the organization and dictates who should act when actions are needed to be taken. The governance should be transparent and set clear decision-making process. On the other hand, management goal is profit growth, control, decision making in daily operations and reporting the results to the board of directors. Also, management is responsible for communications, staff coordination and resource coordination (Van Grembergen and De Haes, 2008).

Although both concepts are focusing on different levels of decision-making, both of them have the common goal in business direction. Moreover, both are interdependent and their overlap is illustrated in the following picture:

Governance	Areas Overlap	Management
Setting strategic plan and monitoring it	Meeting strategic plan objectives	Implementation and driving strategic plan
Approving purchasing over an agreed limit	Purchasing limit	Purchasing below a certain agreed limit within board approved budget
Overseeing finances through financial reports to board	Keeping projects within budget	Detailed understanding of financial position and project-by-project status
Risk management	Constant assessment of risk, financial and otherwise	Reporting to board on risk, actual and potential, developing risk management plan
Making contacts for potential funding, passing on grant information	Ideas about the number and mix of grant proposals	Applying for funding, securing sufficient grant monies to run organisation
Making decisions about income generation i.e. ethics, mix, needs – creating income generation strategy	Ideas about the mix of income streams	Implementing income generation strategy
General framework for staffing matters	Staff performance issues; grievances	Staff matters such as leave, performance appraisals, conditions and detail of supervision

Figure 11: Governance and Management Overlap areas (Source: Adapted from Community Southpark, 2016, p.6)

ISACA's framework, COBIT5, focuses on the clear distinction between the governance and management domains, providing the following explanation (ISACA, 2012c):

“Governance ensures that stakeholder needs, conditions and options are evaluated to determine balanced, agreed-on enterprise objectives to be achieved; setting direction through prioritization and decision making; and monitoring performance and compliance against agreed-on direction and objectives (EDM).

Management plans, builds, runs and monitors activities in alignment with the direction set by the governance body to achieve the enterprise objectives (PBRM)”.

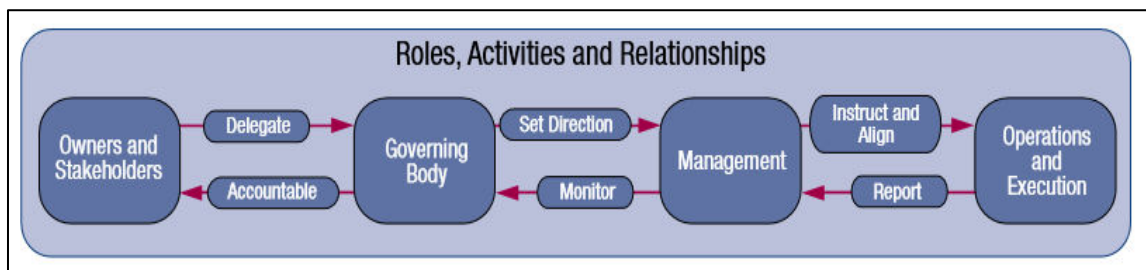


Figure 12: Roles Activities and Relationships in Governance and Management. (Source: ISACA, 2012c)

In Figure 12, ISACA (2012c) clearly illustrates governance and management roles, activities and relationship between them. It defines who and how is involved in both activities and how this vision can be applied in a typical enterprise.

2.6. Project Governance Roles

R. Müller (2009) has defined project governance as the “*value system, responsibilities, processes and policies that allow projects to achieve organizational objectives and foster implementation that is in the best interest of stakeholders, internal and external, and the corporation itself*”. This definition focuses on two major project governance aspects: people in charge of the governance and their defined roles, or, in other terms, the focus is on the project governance structure. Project governance structure represents the project management framework that involves committees and other roles with approved responsibilities and predefined rules.

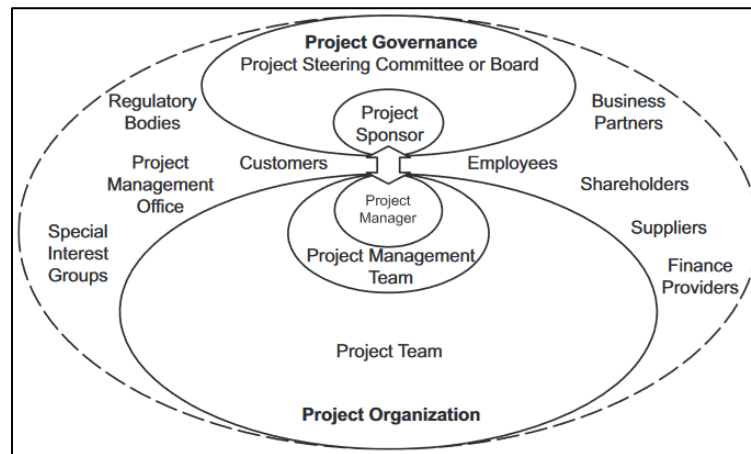


Figure 13: Project Stakeholders (Source: BSI Standards Publication, 2012, Figure 4)

Figure 13 represents the project stakeholders structure by the UK implementation of ISO 21500:2012 – BS ISO 21500:2012 Guidance on Project Management. (BSI, 2012). This standard provides a clear vision of project stakeholders within the enterprise. It is important to identify project management, project stakeholders and sponsors as well as define the relationship between them. A significant condition of a successful project is the partnership between all enterprise project governance roles as their cooperation ensures their goals and objectives are aligned, and the project is managed to achieve maximum benefit for everyone. Figure 13 depicts project roles structure dividing into two categories - internal stakeholders, the roles within the project governance and project organization, and external stakeholders, the others.

The project organization represents a temporary project structure and includes the following roles that can be dependent on certain arrangements between project stakeholders (BSI, 2012):

- Project manager – this role leads and manages project management daily activities and is responsible for the successful project delivery. Project manager plans,

organizes, coordinates and controls the project as well as ensures the proper communication is put in place;

- Project management team – project members, who support the project manager in project management daily activities;
- Project team – members of the project team are individuals, who actively work on project activities.

The project governance is directing and controlling the project and ensures a proper environment for the project to run. Project governance includes the following roles (A. Zandhuis and R. Stellingwerf, 2013):

- ***Project steering committee*** – this is also known as a project board. Usually, a project impacts more than one business division and each business division has different business goals. To reach the agreement between all business divisions and meet everyone's goals, a proper project governance structure is required. This structure is called steering committee. The role of the steering committee is to advise, make decisions, provide strategic oversight and assess all proposed initiatives. Steering committee members provide support, identify risks and define priorities in the project. Usually, they do not work on the project themselves; they help the Project Manager and Project team to implement the project. A good practice advises electing a Chairperson to ensure steering meetings runs smoothly. It is essential to clarify the role of each person of the steering committee and set the expectations towards them. The committee usually consists of executive sponsors, senior managers and senior analysts. It is important not to have too many people on the steering committee will most likely result in debates, rather than decision-making. Rod Beecham (2011) says the ideal number of people on a project steering committee is five, as the number less than five will not allow making adequate decisions, while the number larger than five will become cumbersome and lead to arguments. The frequency of steering committee meetings depends on the project scale. However, it is a good idea to coincide the meetings with achieved milestones.
- ***Project Sponsor*** – this is often an experienced senior executive. He links a project management team with the executives and takes the responsibility to deliver the project outcomes. The sponsor acts as organization representative and covers project financial initiatives. The sponsor does not perform project-related daily activities; he appoints a project manager to take the responsibility of daily efforts and deliver the project according to set objectives. Project sponsor identifies and defines the project, while the project manager works with the already defined project. Moreover, this role is ultimately responsible for the project business case justification and has the right to cancel the project if it does not meet the needs.
- ***PMO*** – Project Management Office (PMO) drives the strategic goals of the enterprise. This concept originated in IT departments struggling to deliver projects

within the budget and on time. PMO was established to boost IT productivity and improve project delivery. ISO 21500 includes PMO with the “other stakeholders”, however, depending on its function, it can be a part of the project governance, as shown in Figure 13. There are two different structures of PMOs – one is acting a consultant role and provides training, guidance and best practices to project managers, the other is a centralized office with project managers who work on different projects in the organization. PMO helps the enterprise to deliver strategic projects and should be able to manage enterprise resources better, reduce project failures and result in savings. If PMO is a part of project governance, it will regularly interact with the senior executives and have the power to cancel or prioritize projects. Moreover, PMO’s oversight is not limited only by project development but may include service coordination and management activities.

Depending on the structure and the size of the company, there can be involved more roles. Speaking of organizations that have a significant number of projects, it is more likely for them to have program and portfolio management in place. Moreover, it is impossible to manage the programs and project portfolios successfully unless a consistent reporting to the steering committee is conducted (David L. Pells et al., 2012). On the other hand, no programs and project portfolios can be successful unless a proper steering committee is put in place. While program and project portfolio managers are focusing on proper management of programs and portfolios, respective steering committee is responsible for communication and consolidation as well as negotiation and decision-making.

The other stakeholders in Figure 13 represent roles or individuals who are directly or indirectly involved in project execution and delivery, including customers, vendors, contractors or third parties.

Apart from all the mentioned above roles, there are two executive roles that are significant when it comes to IT project governance implementation. These roles are (A. Calder, 2005):

- **CEO** – The Chief Executive Officer should be sufficiently knowledgeable about IT governance and project governance as he is the ultimate right to allow governance implementation within the enterprise. A. Calder (2005, p. 36) says, if IT fails to deliver, “*the first person who should be accountable for is the CEO*”. This why the CEO should allow CIO to act as a visionary technologist and develop and execute the organization’s IT strategy. Moreover, CIO should be a significant part of the top executive management and participate in business strategic planning. CEO ensures that both business people and technology people are fully involved in technical project requirements setting, project development and project implementation.
- **CIO** – Although the Chief Information Officer should have business acumen as well as technology experience, he should be a leader more than a technology

specialist and be able to deliver IT strategic goals recruiting staff, which has both technical and business skills. Moreover, the CIO should constantly fight for the IT organization budget, allowing the IT team to develop required skills and competencies. Key responsibilities of the CIO include ensuring IT and ICT infrastructure are aligned with business goals and support the board requirements. Therefore, he must be accountable for the enterprise ICT resources and information management.

COBIT 5 provides more roles involved in project governance in its RACI chart for BAI01 Manage Programmes and Projects process. COBIT 5 describes the nature of involvement of each role for each process practice: responsible, accountable, consulted or informed.

2.7. IT Projects Failure

Over the last decades, project success has been measured by meeting the time, cost and quality targets. However, are these aspects the real indicators of success? Unfortunately, there are many projects that although meet all three criteria, still do not deliver any benefit to the organization. In today's world, a project success definition goes far beyond time, quality and budget metrics.

IT project failure reasons and statistics are being studied each year over the last decades. The Standish Group is one of the researchers, which provides a yearly CHAOS reports, focusing on the project failure statistics and reasons.

In the 2015 report, CHAOS has assessed 50,000 software development projects worldwide. The following table provides the results of studied projects, using the on-time, on-budget with satisfactory result (The Standish Group, 2015):

Category	2011	2012	2013	2014	2015
SUCCESSFUL	29 %	27 %	31 %	28 %	29 %
CHALLENGED	49 %	56 %	50 %	55 %	52 %
FAILED	22 %	17 %	19 %	17 %	19 %

Table 2: Statistics of software projects for 2011 – 2015 (adapted from Standish Group, 2015)

The Standish Group definition for categories:

- Successful project – The project is delivered on time, within the budget and all requested features are implemented;

- Challenged project – The Project is delivered and it is functional, but it was completed later than was specified, the organization has experienced budget overrun and not all requested features have been implemented;
- Failed project – The project was canceled before completion or has never been implemented.

Although some people may question the accuracy of statistical data, the fact is that a huge number of projects fail each year. So what are the real problems of project failures? Is the existing time-cost-quality measurement strategy the only reason of ineffective projects?

The OGC (2005) has published the common causes of project failure:

- Lack of clear links between the project and the organization's key strategic priorities, including agreed measures of success;
- Lack of clear senior management and Ministerial ownership and leadership;
- Lack of effective engagement with stakeholders;
- Lack of skills and proven approach to project management and risk management;
- Too little attention to breaking development and implementation into manageable steps;
- Evaluation of proposals is driven by initial price rather than long-term value for money (especially securing delivery of business benefits);
- Lack of understanding of, and contact with the supply industry at senior levels in the organization;
- Lack of effective project team integration between clients, the supplier team and the supply chain.

All of the above-mentioned aspects are parts of good governance that were discussed earlier. This proves that ineffective project governance increases problems such as misunderstanding among project goal and organization's strategy, failure to meet targets, miscommunication between the development team, clients, the board of directors and stakeholders, inadequate skills and experience of the team or simply poor project governance structure.

2.7.1. Factors for IT Project Success

Each year, along with project success statistical analysis, the Standish Group in its CHAOS reports identifies and ranks the factors, which are key conditions for projects to be successful. The 2015 CHAOS report provides the following list of factors and ranking:

Success Factors	Ranking in Points	Investment Required in %
Executive Sponsorship	15	15 %
Emotional Maturity	15	15 %
User Involvement	15	15 %
Optimization	15	15 %
Skilled Resources	10	10 %
Standard Architecture	8	8 %
Agile Process	7	7 %
Modest Execution	6	6 %
Project Management Enterprise	5	5 %
Clear Business Objectives	4	4 %

Table 3: CHAOS Factors of Success (adapted from Standish Group, 2015)

The CHAOS report explanation for these factors is (The Standish Group, 2015):

- Executive Support: when an executive or group of executives agree to provide both financial and emotional backing. The executive or executives will encourage and assist in the successful completion of the project.
- Emotional maturity is the collection of basic behaviors of how people work together. In any group, organization, or company it is both the sum of their skills and the weakest link that determine the level of emotional maturity.
- User Involvement: takes place when users are involved in the project decision-making and information-gathering process. This also includes user feedback, requirements review, basic research, prototyping, and other consensus-building tools.
- Optimization is a structured means of improving business effectiveness and optimizing a collection of many small projects or major requirements. Optimization starts with managing scope based on relative business value.
- Skilled staff consists of people who understand both the business and the technology. They are highly proficient in the execution of the project's requirements and project or product delivery.
- SAME is Standard Architectural Management Environment. The Standish Group defines SAME as a consistent group of integrated practices, services, and products for developing, implementing, and operating software applications.
- Agile proficiency means that the agile team and the product owner are skilled in the agile process. Agile proficiency is the difference between good agile outcomes and bad agile outcomes.
- Modest execution means having a process with few moving parts, and those parts are automated and streamlined. Modest execution also means using project management tools sparingly and only a very few features.

- Project management expertise is the application of knowledge, skills, and techniques to project activities to meet or exceed stakeholder expectations and produce value for the organization.
- Clear Business Objectives is the understanding of all stakeholders and participants in the business purpose for executing the project. Clear business objectives could also mean the project is aligning to the organization's goals and strategy.

According to the Standish Group, the definition of success is too far from the well-known triple constraints (budget, time, goal). The Standish Group has redefined project success on-time and on-budget with a satisfactory result. They believe that organizations have to forget the triple constraints and focus on the value of project portfolio rather than the individual project. The success factors given in Table 3 are the factors that the Standish Group encourages to use for the new definition of success.

2.8. Standard Practices and Frameworks

Organizations implement different project governance (PG) standards and frameworks to achieve the effective and efficient performance of the projects as well as attain business excellence. Appropriate PG frameworks implementation maximizes a benefits-to-effort ratio, saving time, money and avoiding idle work. Project governance world has developed many different frameworks, thereby causing confusion to understand the focus and purpose of each. To better understand the idea of multiple frameworks existence, the following picture provides a list of standards and good practices (M. Thomas, 2015):

Example Framework Categories								
	Governance	Architecture	IT Service Management	Program and Project Management	Risk Management	Security Management	Quality and Improvement	Lifecycles
Example Standards	ISO38500	ISO42010	ISO20000	ISO21500	ISO31000 NIST	ISO27001 NIST	ISO15504	ISO12207
Example Good Practices	COSO COBIT	TOGAF ASL/BiSL	ITIL	PMBOK PRINCE2	COBIT5 For Risk	COBIT5 for Security	SIX SIGMA PDCA	SDLC AGILE DEVOPS

Figure 14: Standards and Good Practices (Source: M. Thomas, 2015)

As it can be seen, each standard and framework has its own area to cover. Let us discuss each category and related good practices briefly.

Governance and COBIT: Governance, as described earlier, is a set of processes that ensure effective and efficient use of information technologies and the organizations to

achieve goals, meeting stakeholders' needs. COBIT is an IT governance good practice framework, which provides a set of IT control processes with the goal to align IT with business (ISACA, 2012c).

IT Architecture and TOGAF: IT architecture is the process of development of methodical IT specifications, models and guidelines, which uses a variety of IT notations, such as UML. TOGAF is a framework for enterprise architecture that is used to design, plan, implement and govern organization's enterprise architecture (L. Renard, 2016).

IT Service Management and ITIL: IT Service Management (ITSM) – describes a strategic approach to designing, delivering, managing IT and aligning IT services with business needs. Information Technology Infrastructure Library (ITIL) is a framework for IT service management. It guides service providers on the provision of quality services, IT processes, procedures and tasks that can be applied within the organization to support services and achieve organization strategy (A. Claire, 2013).

Program and Project Management and PRINCE2, PMBOK: Project management implies careful planning, organizing, motivating and resource controlling to achieve specific goals and meet specific criteria, while program management is the process of managing a group of related projects in a coordinated manner to obtain benefits not available from managing them individually. The most popular frameworks for program and project management are Projects in Controlled Environments 2 (PRINCE2) and a guide to Project Management Body of Knowledge (PMBOK). PRINCE2 is an iterative, process-based methodology, which focuses on business justification, predefined project management team roles and product planning (PRINCE2, 2016). PMBOK provides a classical project management methodology foundation and guidelines individual projects management. It defines project management-related concepts, describes project and project management lifecycle (PMI, 2013a).

Risk Management and COBIT 5 for Risk: Risk management is an end-to-end, comprehensive view of all risks related to the use of IT and a similarly thorough treatment of risk management, from the tone and culture at the top to operational issues. COBIT 5 for Risk defines IT risk as business risk, specifically, business risk associated with the use, ownership, operation, involvement, influence, and adoption of IT within the enterprise (ISACA, 2012a).

Security Management and COBIT 5 for Security: Information security management is a systematic method to manage sensitive data within the organization and to remain it secure. COBIT 5 for Information Security focuses on information security and provides detailed and practical guidance for information security professionals and other interested parties at all levels of the enterprise (ISACA, 2012b).

Quality Improvement and Six Sigma: Quality improvement implies process optimization and process adjustment, optimizing some predefined set of parameters without any violation of constraints. Six Sigma is a process optimization methodology that identifies and removes the causes of defects. It uses quality management and demands

continuous efforts to get processes to the level where stable and predictable results are produced. IT service management, risk management, quality and improvement management, IT security management, software development lifecycle management, program and project management - all these areas determine which framework to use. It is important to admit that although frameworks were developed to address different business needs, many of the frameworks and standards are interrelated (LSSI, n.d.).

Lifecycle and DevOps: IT lifecycle terminology is used in software engineering and information systems development. It describes planning, development, testing, deploying and information system continuous improvement processes. Development and Operations (DevOps) is a set of practices which focuses on IT alignment with business and aims to help organizations to develop software products and services to enhance operations performance (T. Orlando, n.d.).

2.8.1. PRINCE2

Projects IN Controlled Environments 2 (PRINCE2) is a structured, process-based project management practice, a de facto standard of the UK Government and broadly used internationally (PRINCE2, n.d. a). This methodology can be applied to any type and size of projects. It focuses on what the project delivers, when, why, by or for whom. PRINCE2 projects implementation decision is based on the solid business case, taking into consideration cost-benefits analysis, timescale and risk constraints. PRINCE2 is a flexible methodology, which guides professionals through its four integrated elements: project environment, principles, themes and processes.

There are seven PRINCE2 principles that provide a framework for good practice. They represent the guiding requirements and determine whether the project is genuinely managed using PRINCE2. Unless all of the seven principles are applied to the project, it is not considered as a PRINCE2 project. The principles are (AXELOS, n.d.):

- ***Business justification*** - this implies there should always be a justifiable reason to run the project. Otherwise, the project should be closed;
- ***Roles and responsibilities*** - this refers to the necessity to identify clear organizational structure, assign the right people to tasks;
- ***Learn from experience*** – PRINCE2 teams should continually look for the lessons learned from previous projects;
- ***Manage by exceptions*** – this indicates the right amount of authority for the people working on the project to effectively work within the environment;
- ***Manage by stages*** – this suggests a stage-by-stage PRINCE2 projects planning, monitoring, and control;
- ***Tailor to suit the environment*** - this implies PRINCE2 projects tailoring to adapt to projects environment, complexity, size, risk, and importance;

- ***Focus on products*** – all PRINCE2 projects focus on the product definition, delivery, and quality requirements.

PRINCE2 includes seven themes - knowledge areas, each of which should refer to PRINCE2 principles and must be addressed until the project closing. If the themes are not applied to each principle, the chance of project failure is high. The seven themes are (AXELOS, n.d.):

- ***Business case*** – requires to create and keep the project business justification record;
- ***Organization*** – defines roles and responsibilities for the whole team;
- ***Quality*** – outlines project quality requirements and metrics;
- ***Risks*** – identifies potential project risks and the possible impact;
- ***Plan*** – defines the steps and techniques for project development planning;
- ***Change*** – reflect project managers' assessments and actions when project changes;
- ***Progress*** – shows the current viability and performance of the project.

The PRINCE2 methodology is broadly known as a process-based methodology. It divides the project into separately managed stages making the control easier. Each of the processes is defined by its key inputs and outputs together with the specific goals to be achieved and activities to be carried out. Overall, there are seven processes, which require different management levels (PRINCE2, n.d. b):

- ***Starting up a project*** - the first PRINCE2 process, a pre-project process, which ensures all pre-requisites for the project are in place;
- **Initiating a project** - follows the Starting up a project process. Its goal is to create the foundations for the fulfillment of the PRINCE2 principles. This process ensures that the investment of resources is made wisely as well as encourages the Project Board
- ***Directing a project*** - this process is aimed at the Project Board and is managed and monitored through the reports. Current process can be called a framework for supplying the input to the project manager, receiving requests and information from the project manager and decision makings;
- ***Controlling a stage*** – this process guides the Project Manager in performing his project management duties on a daily basis including work authorization; change and problem management; progress monitoring, analysis, and reporting; problems escalation to stakeholders and taking necessary corrective actions;
- ***Managing stage boundaries*** - this process is used during initiation stage or at the end of each stage for detailed planning of the following stage. It delivers an assessment of the current status and the impact on project or business. This process provides valuable information on which the project board will take decisions whether to continue the project or not;

- **Managing product Delivery** – the goal of this process is actual creation of the product and its delivery. During this process PM assesses the project progress, ensures that the work is finished and satisfies the requirements, as well as meets all quality criteria;
- **Closing the project (CP)** – this process ensures a controlled project closure. It wraps up all project activities. The objectives of CP process are to check if project initiation document requirements are met and evaluate the deliverables; capture all lessons learned and prepare end project report.

Figure 15 shows how PRINCE2 processes are applied throughout the project lifecycle. Each of the listed processes further breaks down into sub-processes that provide the description of what should be done to deliver the process. PRINCE2 has 45 sub-processes in total. PRINCE2 methodology requires fulfillment of all of the seven processes. Moreover, because each project has a unique character, organizations should carefully study and evaluate the methodology and adapt to project needs.

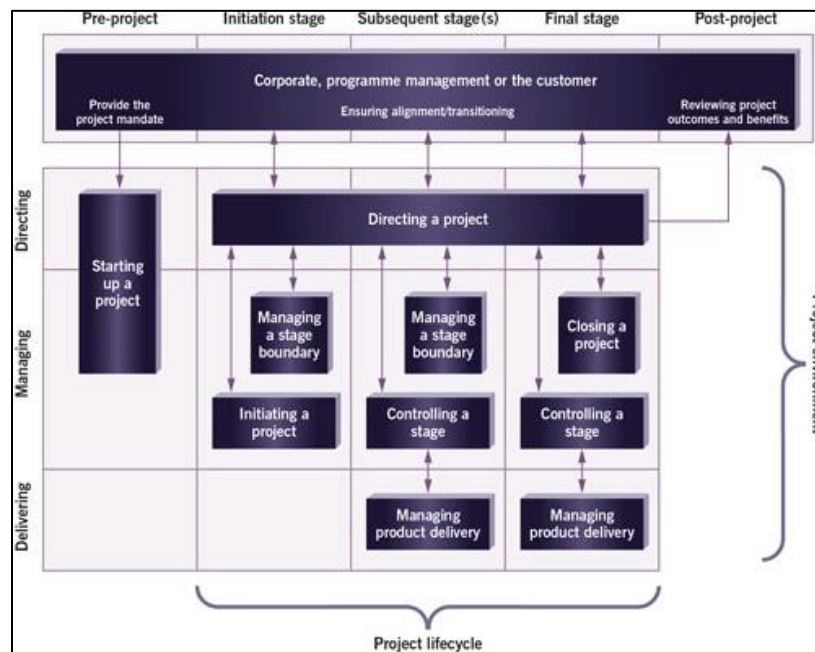


Figure 15: PRINCE2 Processes Through the Project Lifecycle (Source: AXELOS)

In June 2015, a new concept of PRINCE2 was published – PRINCE2 Agile. PRINCE2 Agile was created to guide users on how to use PRINCE2 project management approach in agile environments. The main goal to design PRINCE2 Agile was to bring together the two worldwide-recognized disciplines and benefit from them as Agile drives successful project delivery while PRINCE2 runs projects implementations (PRINCE2, 2016).

2.8.1.1. PRINCE2 Benefits and Challenges

A big benefit of the PRINCE2 methodology is that it provides a common vocabulary for all parties involved in the project, which leads to efficient communication. It results in a more controlled project where both team members and stakeholders express their opinion through regular meetings. PRINCE2 gives an exact definition of responsibilities, so that team members understand each other's roles. While other popular guidelines do not clearly underline team roles, PRINCE2 defines nine management roles and responsibilities (AXELOS, 2015):

- **Project Board** – includes the Executive, the Senior User and the Senior Supplier, where only one person can play an Executive role, while Senior User and Senior Supplier roles can be assigned to more than one person. The Project Board is responsible for the project success. It directs PM and provides resources necessary for the project as well as ensures effective communication between the project team and stakeholders;
- **Executive** – has overall project responsibility and is supported by Senior User and Senior Supplier. He develops the business case at the start of the project and controls if the project is value for money throughout the project lifecycle;
- **Senior User** – specifies user requirements, liaises between the project management team and the users and ensures that final project meets users' needs;
- **Senior Supplier** – represents the interests of product suppliers, for example, designers, developers, those who facilitate and implement the project. He verifies the quality of the suppliers' deliverables;
- **Project Assurance** – this role is responsible for business assurance and ensures that the business aspects are identified correctly, the project is implemented within the budget, time and meets the goal;
- **Project Manager** – manages the project on a daily basis and reports only to the Project Board. Project Manager is responsible for all of the PRINCE2 processes except for the Directing a Project process. He should understand the quality process, proceed project-related change requests, document user requirements, monitor the project, conduct workshops, facilitate meetings and solve team problems;
- **Team Manager** – this role is optional and is used if the project team is quite large or if team members are located at another site;
- **Project Support** – this role provides support to the Project Manager providing services such as administrative services, guidance and advice, risk management services and planning;
- **Change Authority** – this role has the responsibility to assess and consider the project change.

Organizations, which use PRINCE2 methodology to manage the projects, must be ensured that project team is familiar with all PRINCE2 aspects and know how to run the projects. However, in reality, there are many cases when the organization does not have enough trained team members as PRINCE2 courses are quite expensive for companies to train everyone involved in a project team. In addition, because PRINCE2 project managers only have to inform the project board about the status of the project and do administrative work, organizations find it useless to spend the budget on having project managers.

The major weakness of PRINCE2 methodology is that it requires lots of documents to be written and in case of the project change, the process consumes much time. Moreover, PRINCE2 does not provide an explanation for techniques of planning the project as well as there is no information about conflict management and stakeholders' management.

2.8.2. PMBOK

Project Management Body of Knowledge (PMBOK) is an internationally recognized project management guide which provides the fundamentals of project management irrespective of project type – construction, engineering, software or automotive. The PMBOK guide develops over time, and its latest sixth edition came out in 2017 (PMI, 2017). Unlike PRINCE2, PMBOK is considered as a process-driven guide rather than a project management methodology.

PMBOK Guide Fifth Edition, published in 2013, structures its guidelines into 47 processes, which are grouped into five basic process groups including (PMI, 2013a):

- **Initiating** – these processes obtain authorization to define a new project or a new phase within the existing project;
- **Planning** - these processes establish the scope of the project, improve the objectives, and identify necessary actions to be taken to achieve the objectives that the project was undertaken to attain;
- **Executing** - these processes complete the work defined in the project management plan to satisfy the project specifications;
- **Monitoring and Controlling** - these processes track, review, and regulate the progress and performance of the project as well as identify any areas in which changes to the plan are required and initiate the corresponding changes.
- **Closing** - these processes finalize all activities across all process groups to formally close the project or phase.

All the processes within the PMBOK overlap and interact with each other throughout the project. The processes are described using Inputs, Tools and Techniques, and Outputs (ITTO) (PMI, 2013a, p. 72):

- **Inputs** – these are documents, such as project charter, project schedule, change requests,
- **Tools and Techniques** – mechanisms that are applied to inputs. Here tools represent tangible possibilities to perform an activity to create a product, such as analytical techniques or product analysis. Techniques represent systematic procedures to create a product, such as meetings, interviews or expert judgements;
- **Outputs** – represent results or documents generated by the process, including change requests, project management plans or project documents updates.

PMBOK Fifth Edition groups its 47 processes into ten knowledge areas, which are defined as “complete set of concepts, terms and activities that make up a professional field, project management field, or area of specialization” (PMI, 2013a, p. 60). The ten knowledge areas are:

1. **Project Integration Management** – this area covers overall processes needed to define, combine and coordinate all processes within PMBOK five process groups – from Initiating to Closing the phase or project;
2. **Project Scope Management** – the processes within this area ensure the project includes all required works necessary for project success;
3. **Project Time Management** – these processes ensure the project is delivered on time;
4. **Project Cost Management** – processes of this knowledge area plan, estimate, manage and control the budget and costs, ensuring the project is delivered within the budget;
5. **Project Quality Management** – these processes ensure that objectives and project quality and requirements meet stakeholders’ expectations;
6. **Project Human Resource Management** – these processes manage the project team;
7. **Project Communications Management** – processes within this knowledge area keep stakeholders up-to-date and distribute the right information to the right people in the right time;
8. **Project Risk Management** – these processes conduct project-related risk identification, analysis and planning;
9. **Project Procurement Management** – these processes are necessary to purchase products and resources necessary for the project team;
10. **Project Stakeholder Management** – this knowledge area was added in the PMBOK 5th edition and helps to identify and manage the relationship with people or organizations that can impact the project as well as engage stakeholders in project decisions and analyze their expectations.

In 2013, a Software Extension to the PMBOK Guide Fifth Edition was published and approved by the Project Management Institute and IEEE Computer society - the world’s

leading organization devoted to information technologies and computer science. This Software Extension is an addition to PMBOK Fifth Edition that helps to improve the efficiency and effectiveness of project managers to run software projects. It focuses on the best management practices both in delivery of new software projects and modification of existing software applications. The main purpose to create the Software Extension is to assist project managers to overcome challenges that characterize software projects (PMI, 2013b).

Because project management discipline evolves rapidly, in 2017 PMI published PMBOK Sixth Edition. The last PMBOK edition now focuses on agile project management practices that are incorporated within the knowledge areas. The five PMBOK process groups stayed unchanged: initiating, planning, executing, monitoring and controlling, and closing. Although the ten knowledge areas still remain in the Sixth Edition, two of them have been changed: Project Time Management is replaced by Project Schedule Management and Project Human Resource Management is replaced by Project Resource Management. There have also been some changes to the processes. The three new processes added in the new guide are: Manage Project Knowledge, Implement Risk Response and Control Resources. The Close Procurements process was deleted from the sixth edition. Also, the latest PMBOK version has renamed nine processes (PMI, 2017).

2.8.2.1. PMBOK Fifth Edition Benefits and Challenges

The main goal of PMBOK is to provide guidance how to achieve project results in a timely fashion, within the budget and meeting the customers' needs. The major strength of this guide is its tools and techniques that project managers can use as a reference manual to deliver process outputs. Overall, PMBOK Fifth Edition describes 119 tools and techniques across its 47 processes.

Another benefit of PMBOK usage is that the guide's each knowledge area can be used in isolation from another, which means that if the project manager looks for a better understanding of the specific topic, he can focus only on the related knowledge area.

One of the weaknesses of PMBOK Fifth Edition is the lack of project management roles and responsibilities definition. The PMBOK guide describes only project team members who are involved in the project management activities. When it comes to resolving issues, many problems cannot be addressed because there is no clear definition which role is responsible for what.

Additional limitations of the PMBOK guide is the lack of guidance how to proceed from one process to another and no tailoring or step-by-step approach description. Moreover, no post-project activities are performed and no lessons learned or management of the knowledge obtained from the project are being documented and discussed.

2.8.3. ITIL

Information Technology Infrastructure Library (ITIL) is a set of IT Service Management (ITSM) best practices. It is a well-structured framework, which provides detailed procedures, responsibilities, and tasks to identify, plan, deliver, and support IT services. ITIL was developed in the 1980s in the UK by the Office of Government Commerce (OGC) (former Central Computer and Telecommunications Agency (CCTA)) and addressed IT service management, rather than technical issues, although initially there was a significant technical aspect to it. Since 2013 ITIL is a registered trademark of AXELOS, created by the Cabinet Office on behalf of Her Majesty's Government (HMG) in the United Kingdom and Capita plc, to manage, develop and grow the Global Best Practice portfolio (AXELOS, 2013).

The latest version of the framework, ITIL v3, was published in 2011 and focuses on continual improvement and assessment of the IT services. In November 2017, Axelos announced that in 2018 they plan to start development of an updated version of ITIL. While building on the established core of best practice in the existing ITIL guidance, the update will offer new and explicit practical content focusing on the optimum integration of ITIL with complementary practices, such as DevOps, Agile and Lean (Axelos, 2017).

ITIL defines its service delivery strategies as a service lifecycle including the following phases: service strategy, service design, service transition, service operation and continuous service improvement. The main concept of the lifecycle is that enterprises should have all service processes implemented to cover all ITSM processes and should put in place service strategies that ensure enterprises to follow the policies and best practices.

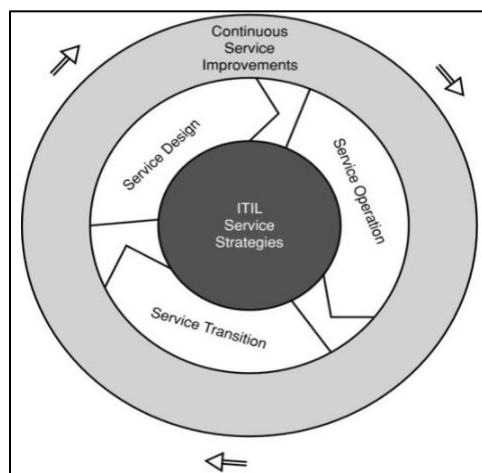


Figure 16. ITIL Lifecycle. (Source: Moeller, R., 2013)

Let us review the five phases, also known as the core of ITIL (Agutter, C. 2013):

Service Strategy – this is the center of the lifecycle, and its purpose is to design, develop and implement service management to assist enterprises to maximize their

capabilities and support customers' needs. Service Strategy objectives include an understanding of organizations' strategy, their services and customers and how value is created and delivered. Moreover, it identifies opportunities to offer services and manage them appropriately making sure that the strategy is delivered. The scope of Service Strategy includes defining principles and processes for service management, which then apply to the rest of the service lifecycle. Having effective service strategy put in place will help organizations to meet business requirements in a timely manner, become a trusted company for their customers and maximize return on investment.

Service Design – this phase is responsible for the design of the service once the strategy has been defined. The key objective of Service Design is to deliver a working service, meaning it should not need major changes once it goes live, and at the same time, the phase must consider the continual improvement of service to make it up-to-date. The scope of the phase is to design services that will satisfy business requirements and take into consideration all constraints that business sets. Service Design improves service quality, ensures services are well implemented and perform well, minimize service costs and enhances service management and governance.

Service Transition – this phase begins when the service is designed and needs to be moved into production. Transition process should be thoroughly planned to avoid negative effects, for example, if the service is not available on live or impacted another service, that will lead to business losses. Therefore, the major goal of this phase is to ensure retiring a service, or implementing a new one, meet expectations. This requires a proper capacity, resource and risk management. Service Transition uses seven processes for service change management: Change Management, Service Asset, and Configuration Management, and Knowledge Management, Transition Planning and Support, Release and Deployment Management, Service Validation and Testing, and Change Evaluation.

Service Operation – this phase is responsible for the services that are in production including day-to-day business activities that are needed to support those services. The goal of Service Operations is to manage transitioned into the live environment services and monitor their performance and metrics. Moreover, any external suppliers that are involved in any service are also covered by Service Operations phase. Objectives of Service Operations include minimization of service downtime time and ensuring service authorization permissions are audited.

Continual Service Improvement (CSI) – this phase operates with all phases within the lifecycle and focuses on identification of service improvement to align enterprise business requirements with IT services. CSI assists in service quality improvement, cost minimization, process enhancement and communication improvement.

2.8.3.1. ITIL Benefits and Challenges

When speaking about IT project management, the outcomes are usually products that require some services to maintain and support them. Therefore, a well-organized ITIL framework would come handy to identify, plan, deliver and support services to maximize their value. With ITIL, project managers will be able to enhance customer experience making services more customer-oriented. Moreover, it will allow reducing service costs by better utilization of resources and improving customer relationship with the service provider through ITIL processes. Project managers will also help business to benefit from proper ITIL usage. The framework will help them to focus on alignment of IT and business goals as well as will provide better visibility of IT investments and resources. A great benefit through ITIL implementation for the organization is proper risk management and service downtime or disruption, which leads to stabilized business environment and well-supported services changes.

However, adoption of ITIL can become challenging for project managers. It requires a broad change to processes that are already set within the enterprise, and although top leadership approves process changes, they tend to fail to follow them. Another problem that project managers may face is that the framework does not provide a thorough definition how to implement processes and they may end up getting lost in ITIL goals. It is also important for project managers to understand that ITIL is a very comprehensive framework and can be applied to any project. However, some enterprises have different best practices in place that work successfully and replacing them by ITIL is not always the best idea as the adoption and adaption phase will consume a lot of time and resources, which may be negatively accepted by the leadership.

2.8.4. COBIT 5

Control Objectives for Information Technology (COBIT) is a comprehensive IT governance internal control framework that helps enterprises to attain their strategic goals. As IT governance aspect evolves, COBIT standards are regularly updated by the IT Governance Institute (ITGI) and the Information Systems Audit and Control Association (ISACA), adapting to rapidly changing business needs (Moeller, R.,2013). The last version of COBIT – COBIT 5 – was launched in 2012 and is considered as the most significant evolution of the IT governance framework. Considerable developments have been made in the COBIT 5 version to place it as a model for the corporate governance of IT. Moreover, it consolidates processes and tools of ValIT and RiskIT frameworks providing a universal approach to IT governance (ISACA, 2012c).

COBIT 5 identifies five main principles that help enterprises to create an effective governance and management framework. It also holistically builds its framework,

introducing seven enablers, which help to optimize stakeholders' investments maximizing their benefits.

The five key principles of COBIT 5 are (ISACA, 2012c):

Principle 1: Meeting Stakeholder Needs – Enterprises are created to bring value to their stakeholders, however, when there are many stakeholders – value delivery has a different meaning to each of them. It is important to ensure that enterprise provides the main governance objective to all stakeholders, which is value creation by realizing benefits at an optimal resource cost with optimized risk.

An actionable strategy is needed to meet stakeholders' needs. For this purpose, COBIT 5 has created goals cascade mechanism, which allows setting of actionable goals and support alignment of the needs on the enterprise level, IT level and service level. COBIT 5 introduces:

- 17 IT-related Goals
- 17 Enterprise Goals
- 7 Enabler Goals

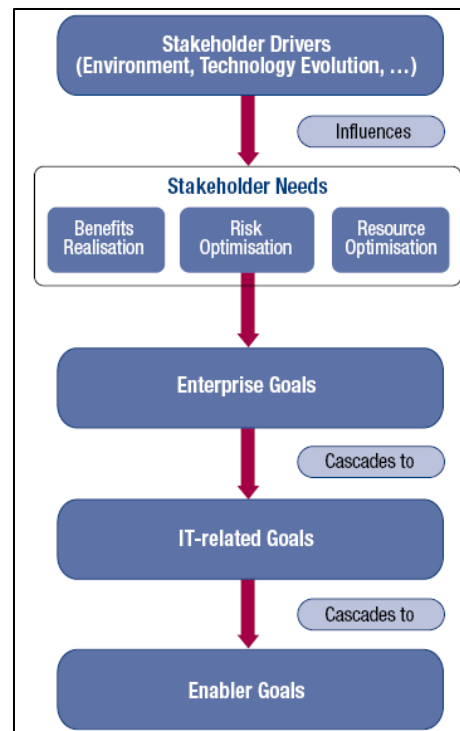


Figure 17. COBIT 5 Goals Cascade.
(Source: ISACA, 2012c)

Principle 2: Covering the Enterprise End-to-end – this principle integrates governance of enterprise IT into enterprise governance, which means that COBIT 5 focuses not only on IT functions, but treats information and related technologies as assets that need to be dealt with just like any other asset by everyone in the enterprise.

Principle 3: Applying a Single, Integrated Framework – There exist many IT-related frameworks and best practices, such as COSO, ISO/IEC 9000, ITIL, TOGAF, PRINCE2, PMBOK. COBIT 5 supports latest relevant best standards and thus can be used as the overarching framework for governance and management of enterprise IT.

Principle 4: Enabling a Holistic Approach – Efficient and effective governance and management of enterprise IT require a holistic approach, taking into account several interacting components. COBIT 5 defines seven categories of enablers to support the implementation of a comprehensive governance and management system for enterprise IT. Enablers are broadly defined as anything that can help to achieve the objectives of the enterprise.

The seven categories of COBIT 5 enablers (ISACA, 2012c):

- **Principles, Policies and Frameworks** are used to create a practical guide to achieve the desired behavior;
- **Processes** represent a list of practices needed to reach specific goals and provide some outputs to achieve IT-related goals;
- **Organizational Structures** are the major decision-makers within the enterprise;
- **Culture, Ethics and Behavior** – these are aspects and characteristics that should not be underestimated as by the enterprise and each individual separately;
- **Information** should be available within the whole organizational entities and guarantees proper governance ;
- **Services, Infrastructure and Applications** involve all IT infrastructure and applications which produce and spread the information within the enterprise;
- **People, Skills and Competencies** – these aspects are of high importance as ensure correct decision making and successful completion of activities.

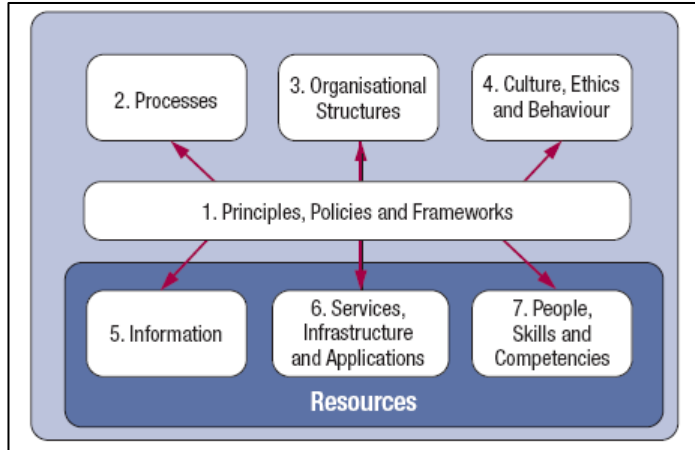


Figure 18. COBIT 5 Seven Enablers. (Source: ISACA, 2012c)

Principle 5: Separating Governance from Management – COBIT 5 emphasizes on the difference between the two disciplines and underlines the difference in their activities, structures and goals. COBIT 5 divides its activities into two main areas – governance and management areas. It also provides a set of 37 processes that are organized in five different domains. By separating governance from management, COBIT 5 means dividing domains according to areas:

Governance Domain:

- Evaluate, Direct and Monitor (EDM) with 5 processes

Management Domains:

- Align, Plan and Organise (APO) with 13 processes
- Build, Acquire and Implement (BAI) with 10 processes
- Deliver, Service and Support (DSS) with 6 processes
- Monitor, Evaluate and Assess (MEA) with 3 processes

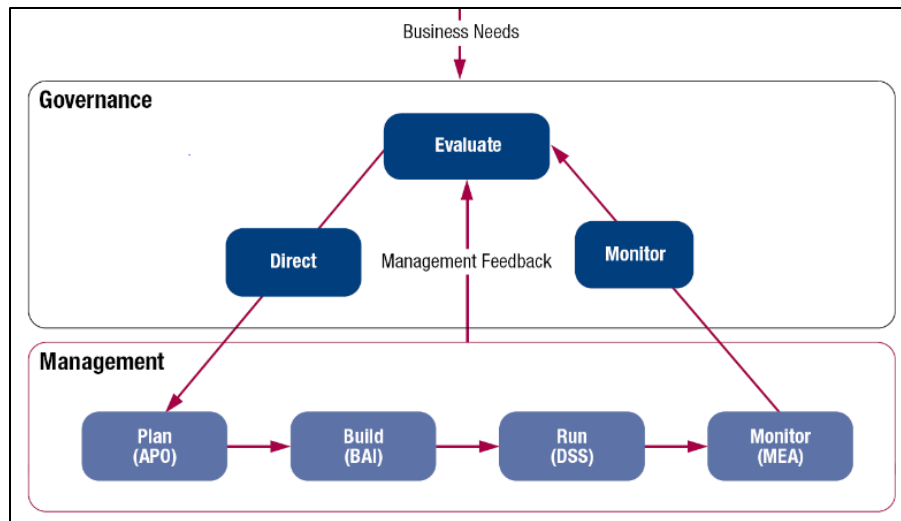


Figure 19: COBIT 5 Governance and Management Areas (Source: ISACA, 2012c)

Each of the 37 COBIT 5 processes also has a number of practices, which focus on more granular activities of the process. Overall, there are 210 practices within the 37 processes. The figure below shows COBIT 5 processes structured within the five domains:

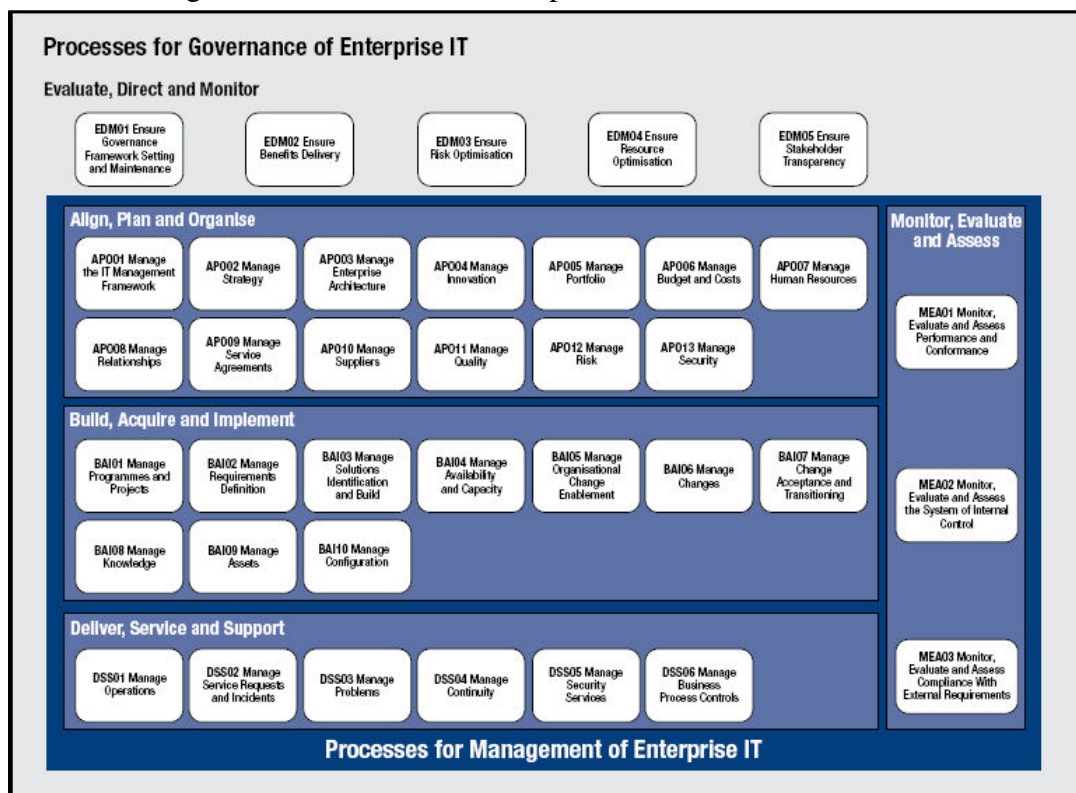


Figure 20: COBIT 5 Processes (Source: ISACA, 2012c)

Overall, COBIT 5 framework provides:

- 5 Principles
- 7 Enablers,
- 17 IT-related Goals
- 17 Enterprise Goals
- 7 Enabler Goals
- 5 Domains
- 37 Process
- 210 Practices

A special place should be allocated for the COBIT 5 Implementation. The goal of this ISACA guide is to provide a good practice approach for implementing IT governance focusing on a continual improvement life cycle that should be tailored to suit the enterprise's specific needs. COBIT 5 implementation lifecycle includes the following seven phases (ISACA, 2012g):

- What Are the Drivers?
- Where Are We Now?
- Where Do We Want To Be?
- What Needs To Be Done?
- How Do We Get There?
- Did We Get There?
- How Do We Keep the Momentum Going?

It is recommended to follow this lifecycle as it gives the enterprise a good starting point and allows improving the ITG step-by-step. Also, the time spent for implementation of each of the phases depends on the enterprise environment and the capability level of the processes.

In addition to the implementation guide, ISACA offers specific tools to evaluate the capability of IT processes. Realizing the significance of technologies in enterprise success, COBIT provides a *Process Assessment Model (PAM): Using COBIT 5*, which helps to assess processes within the enterprise and links IT goals with enterprise goals. PAM is basing the assessment on evidence and provides a consistent and reliable approach to measure IT process capabilities to create the maximum value of IT (ISACA, 2013a).

In addition to PAM, COBIT has published *COBIT Self-Assessment Guide: Using COBIT 5*, which allows enterprises to assess their IT processes less rigorously. This approach can be the step before performing process assessment using PAM. Self-Assessment guide is based on PAM, however, it does not require any evidence to build assessment. This guide was created to simplify process assessment and provides details for basic evaluation of IT process capability (ISACA, 2013b). Self-Assessment Guide helps to identify what type of information is needed to perform an assessment, provides roles and

responsibilities for those, who should evaluate processes, and guidance on how to evaluate process capability.

COBIT 5 introduces six capability levels for process assessment and nine process attributes, applied to process capability to identify if a process has reached a given capability:

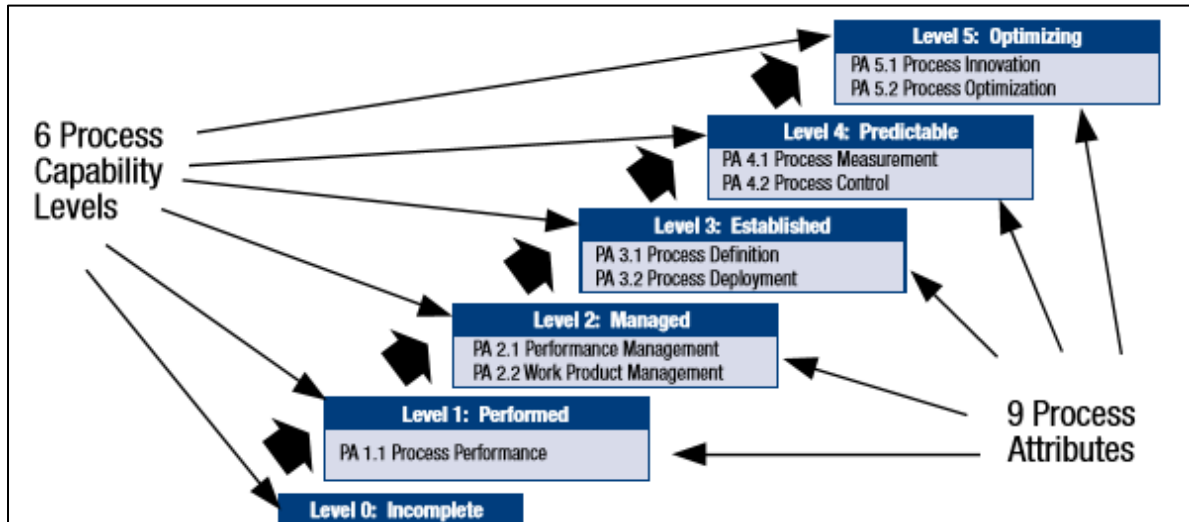


Figure 21: COBIT 5 Process Capability Levels and Attributes. (Source: ISACA, 2013b)

The capability level of a process is determined by whether the process attributes at that level have been largely or fully achieved and whether the process attributes for the lower levels have been fully achieved (ISACA, 2013b).

Overall, the COBIT Self-Assessment process involves a five-step approach and helps to recognize process gaps that need to be improved before performing a formal assessment using PAM (ISACA, 2013b):

- Step1: Decide on the process to assess – scoping.
- Step2: Determine level 1 capability.
- Step3: Determine capability for levels 2 to 5.
- Step 4: Record and summarize capability levels.
- Step 5: Plan process improvement.

2.8.4.1. BAI01 – Manage Projects and Programs

Despite the benefits that IT brings to the business, IT projects successful delivery remains the major challenge. COBIT 5 as a comprehensive IT governance framework, which is aligned with the latest best IT-related practices, including IT project standards, has introduced a process to ensure that IT management has overall control over the projects.

BAI01 – Manage projects and programs is one of the ten processes of the Build, Acquire and Implement domain. This process is responsible for the management of all projects and programs in a portfolio and ensures they are aligned with the enterprise strategy. The main goal of BAI01 is to gain business benefits by minimizing project-related risks, which may impact the schedule, budget or end up to be implemented lacking some features. Process goals defined in ISACA reference guide are (ISACA, 2012f):

- Relevant stakeholders are engaged in the programmes and projects
- The scope and outcomes of programmes and projects are viable and aligned with objectives
- Programme and project plans are likely to achieve the expected outcomes
- The programme and project activities are executed according to plans
- There are sufficient programme and project resources to perform activities according to the plans
- The programme and project expected benefits are achieved and accepted

The BAI01 process supports the achievement of the following IT-related goals (ISACA, 2012f):

- Alignment of IT and business strategy
- Managed IT-related business risk
- Realized benefits from IT-enabled investments and service portfolios
- Delivery of programmes delivering benefits, on time, on budget, and meeting requirements and quality standards

COBIT 5 provides specific management practices separately for the program and project management. Each management practice clearly identifies activities that should be undertaken to implement the practice successfully, as well as specifies inputs, and outputs. BAI01 management practices are (ISACA, 2012f):

Defined for program management:

- BAI01.01 - Maintain a standard approach for program and project management
- BAI01.02 - Initiate a program
- BAI01.03 - Manage stakeholder engagement
- BAI01.04 - Develop and maintain the program plan
- BAI01.05 - Launch and execute the program
- BAI01.06 - Monitor, control and report on the program outcomes
- BAI01.14 - Close a program

Defined for project management:

- BAI01.01 - Maintain a standard approach for program and project management
- BAI01.07 – Start up and initiate projects within a program
- BAI01.08 - Plan project
- BAI01.09 - Manage program and project quality
- BAI01.10 - Manage program and project risk
- BAI01.11 - Monitor and control projects
- BAI01.12 - Manage project resources and work packages
- BAI01.13 - Close a project or iteration

Moreover, COBIT 5 effectively uses RACI chart for each of its processes to assign different levels of responsibility for different organizational structures and roles within each management practice.

RACI Chart		
R	Responsible	Who is getting the tasks done?
A	Accountable	Who accounts for the success of the tasks?
C	Consulted	Who is providing input?
I	Informed	Who is receiving information?

Figure 22: RACI Chart. (Source: Adopted from ISACA, 2012f)

ISACA documentation, COBIT 5 supporting documents, PRINCE2 and PMBOK standards that BAI01 process refers to as related guidance, - all together provide good assistance to project managers and top leadership in successful project management. Moreover, other COBIT 5 processes that BAI01 interacts with, provide a holistic approach to project-related activities. For example, BAI02 assists in requirements management, while BAI03 is responsible for solutions management and BAI06 helps to manage changes. Metrics that COBIT 5 provides in each of its processes provide a good direction for the top leadership on how to focus on the project-related indicators.

2.8.4.2. COBIT 5 Benefits and Challenges.

COBIT 5 provides a holistic approach to enterprise IT governance aligning strategic goals of the enterprise with IT-related goals. As a comprehensive IT governance framework, it also focuses on project governance aspects and directs on a better alignment between business and ICT projects, helps to evaluate project performance and optimizes project risks. COBIT is structured in such a way that helps enterprises to identify and eliminate gaps between IT processes and business processes, independent of enterprise size. One of the biggest advantages of COBIT 5 is its compliance with the best governance standards, which ensures enterprise-wide-goal-oriented IT environment.

However, there are also some challenges related to COBIT 5 adoption and implementation. COBIT 5 offers a big range of roles and responsibilities for each of its processes represented by RACI chart. While this can be seen as a benefit, this fact brings to implications when it comes to management of so many stakeholders with different goals and accountabilities. Moreover, business world and information technologies are changing dynamically nowadays which requires continuous adaption of the ICT department. A huge burden is put on ICT project managers, as they need to adjust their processes to conform to the latest business regulations and very often they need to master new best standards. Although COBIT 5 provides a very good guide on how to adapt to new processes and points out which best industry practices and supporting documents should be used, one has to be COBIT 5-qualified to be able to demonstrate and apply the framework.

2.9. Summary

This chapter provides a clear vision of the ITG and PG concepts as well as gives a good understanding on how both can be applied within the organization. Based on the reviewed literature, it was found that ITG represents a performance dimension of the enterprise governance, while corporate governance is explained as a conformance dimension of the organization. Both dimensions formulate the integrity of the good enterprise governance. Moreover, PG was recognized as the extension of the corporate governance, responsible for the alignment of ICT projects with the enterprise needs. In addition, the theoretical background focuses on the five key areas of the ITG that allow making the management of IT successful. The ITG key areas are alignment, value delivery, risk management, resource management and performance management. On the other hand, strategic alignment, risk management, portfolio management, organization, stakeholder management, performance evaluation and business transformation represent the major components of the PG that guarantee the success of IT projects initiatives within the enterprise. Later, the reasons of IT projects failure are provided as well as the factors for IT project success are interpreted. This chapter also focuses on the difference between the two main concepts - governance and management. COBIT5 framework provides a clear distinction between these two domains, explaining how the roles and activities differ between both. Governance evaluates the balance in the enterprise, sets the direction and monitors the performance (EDM), while management plans, builds, runs and monitors the activities set by the governance (PBRM). Lastly, some of the PG standards as well as ITG frameworks are outlined. PRINCE2, and PMBOK provide good practices for the PG. PRINCE2 represents a structured, processed based project management methodology, applied to any type and size projects. PRINCE2 ensures good project communication and defines multiple project management roles and responsibilities. PMBOK is a process-oriented guide, which enables project managers to use its tools and techniques as a manual to deliver successful process outputs. However, the PMBOK lacks project management roles and project-related responsibilities definition.

The two widely recognized ITG frameworks ITIL and COBIT5 are also discussed. ITIL provides guidelines for successful ITSM, focusing on the improvement of customers' satisfaction. This framework ensures risk reduction and performance measurement for ICT projects. COBIT5 represents a comprehensive IT governance framework and focuses on project governance aspects, directing a better alignment between business and ICT projects. It provides a holistic approach to enterprise ITG eliminating gaps between IT and business processes. COBIT5 provides tools allowing organizations to measure their IT processes and thrive towards their improvement by following the management practices explained in each COBIT5 process.

3. RESEARCH METHODOLOGY

In previous chapter, basics of ITG and PG as well as relevant literature was discussed to provide a clear understanding of ITG and PG scope and underline main aspects. In this chapter, the researcher focuses on the method she used to conduct the research for the current thesis.

3.1. Selection of the Research Topic

In order to make the research study meaningful and interesting, the researcher understood that a relevant research topic should be selected. When choosing a topic for the thesis, the researcher made sure to select the topic that was interesting as well as broad enough to find the necessary information to conduct the research. The scope of the topic was also taken into consideration. While brainstorming the ideas for the thesis, researcher understood it would be easier to select a topic by knowing its background. Also, the direct access to the relevant data and the possibility to interview potential respondents have influenced the selection of the final research topic.

3.2. Research Strategy

The research strategy utilized for this thesis is a case study strategy. The reason this strategy was chosen is that it helps to obtain a good understanding of the research context (Morris and Wood, 1991 cited in Saunders et al., 2009). Also, it can be perfectly applied when there is a need to get the answers on questions, such as “why?”, “what?” and “how?”, and is most often used in explanatory or exploratory research (Saunders et al., 2009). Moreover, within the given scope of the thesis, the researcher will focus only on a single case study as it provides an opportunity to define, observe and analyze an actual case of personal interest.

3.3. Research Approach

Based on this thesis’s main research question, a qualitative approach has been chosen to perform the case study. This method is used for any data collection process that provides non-numerical data (Saunders et al. 2009). As this type of research has an exploratory nature primarily and looks for relevant answers on given questions, the researcher used it to collect evidence and understand the main reasons, behaviors, and motivations of the interviewees. Also, the qualitative approach provides a good insight on how people experience problems related to the research issue. Generally, the data collection using

qualitative methods differ depending on the nature of research. However, the common methods are group discussions, observation of participants and individual interviewing (Saunders et al. 2009).

Within the scope of the current thesis, the researcher will perform a qualitative approach by interviewing respondents. The answers provided by the respondents will be interpreted and thoroughly analyzed to inspect the crucial factors that influence the implementation of proper project governance within the chosen environment.

3.4. Interviewing Methods

During the research study, the researcher will focus on the semi-structured interviewing method (Saunders et al. 2009). The researcher will prepare a list of questions and will guide the conversations. However, she will not necessarily follow the list but will use the questionnaire as a guide and will approach it as open-ended questions to give the interviewees the flexibility to answer. The main reasons the researcher selected this method is that questions can be changed and adapted according to respondents answers. Also, the researcher realized that this approach would allow the interviewees to answer the questions freely, choosing their own words and provide an in-depth analysis of their responses.

3.5. Interviewees Selection

Selection of interviewees is an important phase of the research and is highly dependent on their role and responsibilities within the organization. For the given research, the researcher needs to find the respondents who play active roles in the project management and project governance. The goal of this research is to get as much insight as possible and interview as many people as possible to be able to evaluate the current state of project governance within the chosen sample business unit. The target respondents for this study should have a relevant role, applicable skills and knowledge to add maximum value to the research.

3.6. Research Questions

To obtain a better insight on the current state of the IT project governance in a sample company, the researcher prepared a semi-structured questionnaire. The goal of preparing a questionnaire was to maximize the chances to get all the necessary information that cannot be straightforwardly perceived. As questionnaires are the most used technique to collect the data, the researcher made sure that the survey questionnaire is written well and allows to obtain insights and ideas to make the research study maximally accurate. Moreover, the

researcher considered the fact that a good questionnaire will help the interviewees to better understand the purpose of the research as well as the idea of the question, which will positively reflect on their answers, making the responses more meaningful.

To examine how well the projects are aligned with business strategy, the researcher decided to apply important aspects of IT governance and project governance that were covered in the literature review. She focused on enterprise project governance components that were covered in Section 2.3: strategic alignment, risk management, portfolio management, organization, stakeholders management, performance evaluation and business transformation (David L. Pells et al., 2012). Because IT project governance is closely related to IT governance, the researcher also considered IT governance key areas discussed in Section 2.2.2: alignment, value delivery, risk management, resource management and performance management (ISACA, IT governance, 2006, p.6). Diving deep into the components mentioned above and key areas, she decided to apply a holistic approach when creating a list of questions. Therefore, she covered both IT governance and project governance main aspects in her questionnaire and divided her list of questions into the following six categories:

- Portfolio management
- Strategic alignment
- Performance measurement
- Resource management
- Risk management
- Value delivery

These six categories of questions have supporting questions to make sure all factors are considered as well as interviewees understand which topics to cover during the interview. The full questionnaire can be seen in Appendix C.

The researcher will later analyze the answers to the six categories of questions and use the evidence collected during the interview to answer the main research question: *What can be done to improve the Project Governance?*

3.7. Data Collection

To avoid any sort of biases and minimize mistakes when conducting research, it is important to employ a well-structured and planned approach for data collection (Saunders et al. 2009). The researcher will use several methods to obtain as much information as possible. She will perform data collection using three methods: self-administered survey, telephone interview, and face-to-face recorded interview.

3.8. Data Analysis

Once the data is collected, the data analysis process begins. The researcher will perform a detailed within-case analysis. For the recorded interview, she will perform transcribing – represent the data as a written account using actual words (Saunders et al. 2009). In case of self-administered surveys, the researcher will have electronically captured information, which she will anonymize and clean up if necessary. And, lastly, for telephone interviews, the researcher will analyze notes made during the call. Once she has her transcript and notes ready, she will summarize the data. Summarized data will compress long statements and rephrase it in a few words (Kvale, 1996 cited in Saunders et.al. 2009).

3.9. Research Findings

When the within-case analysis is performed and evidence is collected, the researcher will identify to what extent the main ITG and PG aspects are implemented within the chosen business unit and how they impact the success of the ICT PG. The research findings will be discussed with the sample department representatives in order to find the answer to the main research question.

3.10. Recommendations

When researcher will analyze the data, she will use her knowledge and skills to provide recommendations to the chosen sample organizational unit for future improvements. If the research will show that PG improvement in the selected department is required, she will base her recommendations on the literature review covered in the theoretical part of the thesis.

3.11. Summary

This chapter has covered the research methodology the researcher applies to perform her research study. The researcher will use the case study and focus on the qualitative approach by interviewing her respondents. She will prepare a questionnaire and will collect the data through self-administered survey, telephone interview, and face-to-face recorded interview. Later she will analyze the collected information and will provide the recommendations on how to improve the project governance within the selected department. The next chapter will focus on the actual research and will provide the case study findings.

4. CASE STUDY

In this chapter, the researcher performs the research based on the methodology established in the Chapter 3. Section 4.1 provides the details of the company profile, its mission and vision, current roles and responsibilities, and organizational structure. Section 4.2 elaborates on the existing problem within the chosen sample business unit. The chapter smoothly transfers to the Interview Preparation section discussing the whole process of the interview arrangement. Section 4.4 provides the actual interview and data processing methods. Later, the researcher presents the collected empirical data, divided into six categories based on the discussed in literature review ITG and PG key aspects: portfolio management, strategic alignment, performance measurement, resource management, risk management and value delivery. Section 4.6 covers the research findings. The responses to the supporting questions of the ITG and PG six key categories will be discussed in the Section 4.6.1, while Subsection 4.6.2 provides the analysis of the evidence collected during the interview. The answer to the main research question will be derived with the assistance of the GSCC ICT manager and presented in Section 4.6.3. Section 4.6.4 summarizes the information on the whole case study.

4.1. Company Profile

In this section, the researcher will discuss the sample company to provide a good understanding and accurate impression of the business. For anonymity purpose, the name of the organization where the research study was held is disguised and referred as Company X. To retain proper secrecy, the Company X profile will be described very briefly as due to its popularity it will be very easy to identify it.

Company X is one of the largest e-commerce company in the United States of America. Along with e-commerce, the company focuses on the delivery of cloud computing services that can easily be integrated with on or off-premises systems. Company X has presence in over 100 countries and has more than 500,000 employees spanning over more than 30 business units that are focusing on different fields of business.

Within the scope of the current thesis, the researcher will focus on one of the Company X's business units– the Global Security and Communications Centers (GSCC). The GSCC is based on a crisis management model and is committed to ensuring a centralized security-centric approach for the whole business network as well as employees within the Company X. Its goal is to provide exceptional support and guaranty the safety of the assets, properties, and employees. The GSCC achieves this goal by providing a centralized point of contact for its customers and ensuring that pertinent stakeholders can be notified to assist in the event of a safety, operational or brand impact. Due to the high demand for the GSCC services, the team grows rapidly. Currently, the GSCC has three Regional Operational Centers (ROCs) located in North America, Czech Republic, and China. These centers

represent the central resource for all emergency response management, triage support, and coordination for the organization's network. All three centers are staffed and operated by knowledgeable Crisis Managers and Business Continuity Analysts, who possess the knowledge, skills, abilities, and professional experience dedicated to safeguarding employees, property, assets, and ideas globally. The number of staff employed within the GSCC exceeds 100 and will continue growing as the business expands.

GSCC customers: Due to the number of services that the GSCC provides, it has a wide range of customers within the company's operational facilities. The GSCC ensures that their customers in regional and senior leadership positions remain informed of ongoing incidents through event reporting and updating. Through its involvement in crisis management and intelligence products, the GSCC works with the site and regional Loss Prevention, Safety, Operations and Facilities. The GSCC also facilitates communication between these customers and other operational teams, such as Legal, Public Relations, InfoSec, IT and others. The GSCC customers can address the team regarding any event that affects, or has the potential to affect, their safety, operation or brand.

GSCC mission:

- Triage, coordinate, and facilitate crisis management response to events that have potential to disrupt operations, enabling timely decision-making and mitigation
- Assist in restoring critical business processes after a disruption or crisis has occurred
- Facilitate the deployment of the Incident Management Teams to enhance communication and coordination efficiencies
- Provide intelligence products, services, and consultation to protect associates, sites, and brand
- Provide post-incident reports and recommendations
- Provide access control monitoring services to Amazon locations around the globe on a 24/7 basis

GSCC vision: The Global Security and Communications Centers provide crisis management assistance to key stakeholders through event triage, conference call facilitation, and response coordination for events that impact the safety, operations, or brand of the company's operations and personnel. The GSCC staff supports the security stance of operational sites by monitoring access control systems, dispatching alarms, providing timely tactical intelligence products for the advance warning to sites, and crisis management facilitation in the event of an impactful incident. To provide uninterrupted support, the GSCC ROCs together provide 24/7 support to operational facilities year-round.

4.1.1. Roles and Responsibilities within the GSCC

GSCC Senior Manager in Crisis Management (Sr. Manager, CM): The general scope of this role is to develop new strategies within the GSCC, set direction for the team and influence across the entire organization. Senior Manager usually collaborates with legal teams to interpret and define obligations for the legal entity, engages with leadership to design program controls and influences the senior leadership to implement strategic and programmatic controls as well as to balance risk management concerns. Senior Manager in Crisis Management oversights the three Regional Operations Centers, Global Intelligence Manager, ICT Manager and Methods and Procedures Manager.

Site Lead: This role reports directly to the GSCC Senior Manager in Crisis Management. He operates with significant autonomy and discretion, influences other internal and external teams to design crisis management program controls and business continuity testing plans. He might manage multiple crisis management teams and, depending on the team structure, has Senior Crisis Managers, Crisis Managers and Assistant Crisis Managers directly reporting to him.

Senior Crisis Manager (Senior CM): This role has the senior decision-making authority within the ROC. He makes recommendations to the Site Lead and other senior leadership, ensures the risk management practices, identifies and suggests improvements in the current crisis management methodology. Depending on the team structure, Crisis Managers and Assistant Crisis Managers directly report to him.

Crisis Manager (CM): CMs takes the ownership of the shift and Oversees associates to ensure use of existing policy and procedures when responding to and managing incidents from inception through completion. He manages analysts' performance and provides coaching for the growth of both personally and professionally. CM provides the final approval of the crisis management team tasks. Depending on the team structure, Assistant Crisis Managers and Business Continuity Analysts report directly to CM.

Assistant Crisis Manager (ACM): ACM works and executes with the direction of CM or Senior CM. He serves as intermediate Subject Matter Expert (SME) by providing guidance and recommendations to Business Continuity Analysts for crisis management incidents. ACM assists the CM or Senior CM in ensuring all daily tasks within the operation center are completed on a daily basis by providing direction and accuracy to the analysts' tasks before the CM's final approval.

Business Continuity Analyst (BCA): BCAs work and execute with the direction of ACMs and CMs. They are the primary point of contact for escalation of incidents involving life safety, operations and brand of the company globally. BCAs monitor, report and escalate physical alarms at operational sites globally to ensure the safety and security of personnel and property. They identify, collect, analyze and disseminate open source intelligence products for the safety, security and operations of company sites globally. This includes weather, natural incidents, civil disturbances and terrorist attacks on a global level.

Global Intelligence Manager: Global Intelligence Manager reports directly to the GSCC Senior Manager and has a strategic Intelligence Analysts Team as direct reporters. This role maintains subject matter expertise to remove or reduce threats/risks by identifying, analyzing and highlighting those threats/risks and by making recommendations to assist with implementing precautions or control measures to treat, tolerate, transfer or terminate them.

Strategic Intelligence Analysts: These analysts report to Global Intelligence Manager and provide risk assessments to global managers and leadership to make sure company's employees, assets and property are protected as well as possible and that sites are aware of issues, which could impact operations.

Information Communications Technology Manager (ICT Manager): This role is responsible for managing a technology program, successfully delivering improvements to a product and/or to meet program goals. ICT Manager focuses on the larger business and technology picture, works across teams, influences project process, priorities, and trade-offs. May influence vendors and external partners.

Program Manager (PM): PM is responsible for successful delivery of the GSCC projects. He plans, monitors the progress, manages resources and project risks, and ensures proper communication between stakeholders. PM within the GSCC is responsible for non-technical tasks of the project. He reports directly to ICT Manager.

Technical Program Manager (TPM): TPM has engineering experience and works on well-defined technical projects. He defines technical requirements, coordinates the development of technical features. Applies best practices to accelerate processes and make the team more efficient.

Senior Software Development Manager: This role is responsible for defining and delivering programs with significant complexity and that have a technical and global impact. He focuses on large engineering efforts that solve significantly complex or endemic problems for the company. Within the GSCC, Senior Software Development Manager works closely with the ICT Manager and the GSCC Senior Manager.

Software Development Engineer (SDE): SDEs work directly with TPMs, PMs, ICT manager and report to Senior Software Development Manager. They design the software to eliminate business problems, constantly simplify and innovate business processes using the state-of-art technologies.

4.1.2. The GSCC Organizational Structure

Figure 24 represents organizational structure of the GSCC. The diagram visually explains the hierarchy of the business unit. At the GSCC level, the highest-ranking position is GSCC Senior Manager in Crisis Management, who is located at the company's main location. He has the three ROCs reporting directly to him as well as ICT Team and Software Development Team.

North American Regional Operational Center (NA-ROC): NA-ROC is the first operational center in the company and was launched by the crisis management team in 2013 in Phoenix, Arizona. Figure 24 shows the structure of the NA-ROC. At the moment, the ROC consists of one Senior Site Lead, one Global Intelligence Manager, one Strategic Intelligence Analysts team and four crisis management teams working in shifts to provide their services 24/7. Each crisis team consists of the BCAs who report to ACM and CM, while the last one reports to the Senior CM of the team. The NA-ROC has 36 BCAs, 4 ACMs, 5 CMs, 4 Senior CMs, 5 Strategic Intelligence Analysts, 1 Global Intelligence Manager and 1 Senior Site Lead, which in total makes 56 Employees. The American team is dedicated to safeguarding company's employees in North America, South America, Canada and India and monitors 580 sites in the mentioned locations.

European Regional Center (EU-ROC): EU-ROC was activated in 2016 in Prague, Czech Republic and had only three BCAs and two CMs. The center has grown from its initial 5 to the current 25 headcounts and currently provides security services only during weekdays from 08:00 – 18:00 UTC. Due to the rapid expansion of the team, a significant gap of experience now exists between the original analysts and the newest hires. This fact does not allow for 24/7 operations, and a rigorous system of handover/takeover (HOTO) with the NA-ROC team was put in place to ensure that there is no loss of coverage during EU-ROC downtime. The HOTO process provides accurate and systematic passing along with detailed information from the current EU-ROC shift handler to the NA-ROC shift. It helps to improve communication between shifts as well as ensures a proper execution and better oversight of ongoing incidents. As of now, the EU-ROC has only one shift and consists of 21 BCAs, 1 ACM, 1 CM, 1 Intelligence Manager and 1 Senior Site Lead. The team is committed to supporting employees and assets within European, Middle East, and African (EMEA) countries. Overall, the EU-ROC monitors and supports 300 sites in the EMEA region.

China Regional Operational Center (CN-ROC): CN-ROC was launched together with the EU-ROC in 2016 and for now represents the smallest ROC. The team has only 1 Senior CM and 7 BCAs. Despite the small size of the team, the CN-ROC provides 24/7/365 security services and remains responsive to its customers in China, Australia, Philippines, Japan and Singapore. The team provides support to 132 sites in the mentioned locations.

ICT Team: ICT team within the GSCC was created in March 2017 and consists of five members who focus on the delivery of projects for their customers - the GSCC ROCs. This team was created upon an urgent necessity to manage technical projects that the GSCC team needed to remain efficient. To provide business-aligned technical products, the team has members in different locations. ICT manager is located in company's main location to work closely with the senior leadership and software development team. PMs and one of the TPMs are located in Phoenix to be able to collect business requirements directly from their customers. Another TPM is located in Prague also to be able to work directly with

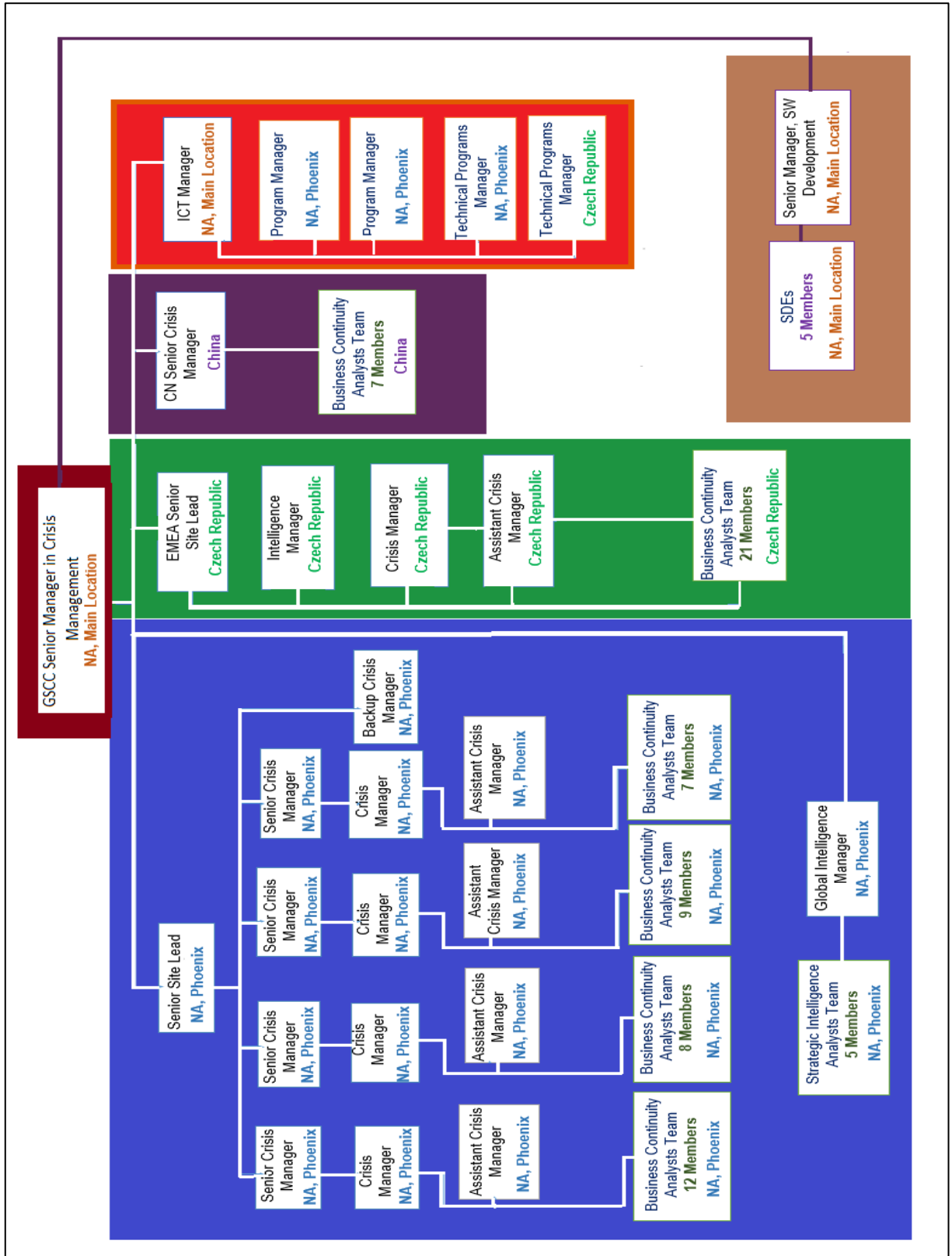


Figure 23. GSCC Organizational Structure (Source: The Author).

customers and be able to understand the problems and define customers' requests. At the moment, the team owns eight technical products developed or purchased for the GSCC.

Software Development (SD) Team: SD team is staffed with one Senior Software Development Manager and five SDEs and is located at the company's main premises. Although the team is not solely dedicated to the GSCC, it develops all technical products for the GSCC to support their processes. Four out of eight GSCC information systems were developed internally by the SD team, while for the rest four products purchased from vendor companies, the team provides technical support creating APIs or other required technical services.

4.2. The Problem Definition

Crisis and incident management is the primary mission of the GSCC. To triage, coordinate and facilitate crisis responses to events, this business unit needs to provide continuous support to its customers. Therefore, one of the crucial aspects to ensure 24/7 support and provide accurate data to affected people is the current state of information systems within the GSCC.

All IT systems within the department should be aimed at the GSCC performance improvement and efficiency enhancement of the team's activities. The Company X has over 20 years experience of successful project management process. Moreover, most of the business units of the company are familiar with enterprise governance, IT governance as well as project governance aspects and use the best practices for their competitive advantage. However, because the Company X has evolved rapidly, many organizational units have been created upon an immediate necessity to support the business. Therefore, many information systems and IT projects were implemented ad hoc. One of the departments that experienced underdeveloped project governance is the GSCC. To follow the best practices, the department needs a proper IT management, good project governance and clearly identified processes, especially because the department is also a fast growing one and its services are under a huge demand.

The GSCC has a team of more than 100 people employed in different roles. However only five people are focusing on meeting the business demands by managing and implementing ICT projects. The ICT team was created just a year ago as a result of an immediate need to deliver ICT projects, there was no space and time for the team to implement project governance or IT governance best practice framework. Overall, the "governance" is a quite new concept for the GSCC ICT team. Therefore, to bring advantage by the implementation of new information systems or by changing existing ones within the department, an effective project governance structure is required to be employed. To assist the GSCC ICT team in adoption of the PG, the researcher will perform her research and identify the factors that play key role on the PG state. She will assess the current state of

ITG and PG main aspects and based on the results will find recommendations what could be done to improve the project governance within the GSCC.

Company Profile	Company Experience in Project Management Process	Company Experience in Project Governance Process	Project Management Adoption in the Department	Project Governance Adoption in the Department
One of the largest e-commerce and cloud computing companies in the USA	More than 20 years of ICT project management and implementation	Uses governance in most of its departments to implement and run projects as well as business to keep up with standards and quality management	Less than a year of ICT implementation experience as well as an overall project management process	Currently seeking for the best ways to adopt project governance and best practices to successfully run the projects

Table 4: Summary of the GSCC Profile

4.3. Interview Preparation

The whole research was built according to requirements identified in the Research Methodology chapter. First of all, the researcher made sure to have enough information and knowledge about the organization. The researcher had direct access to publicly available company documents and reports. This kind of information ensured the researcher's credibility and inspired the participants to provide more detailed answers to the research questions.

Secondly, the researcher prepared a well-structured questionnaire and made sure that questions were phrased in an adequate and precise manner so that interviewees find them easy to understand. This step was very important to guarantee the respondents provide their answers with confidence and full understanding.

The respondents for the research study were also chosen based on the Research Design requirements – according to their roles within the organization. The following roles were identified to be interviewed: ICT Manager, Program Managers, Technical Project Managers as well as stakeholders, in the given case – Senior Crisis Managers and Crisis Managers of all three ROCs. Due to the specificity of the current study, and the fact that the research was conducted only for one business unit of the Company X, at least one member of each ROC should have been interviewed.

To start the research, the researcher had to clarify with company's legal counsels what type data should be kept anonymous within the scope of the study. Legal counsels expressed concerns of public exposure of the company's name. The researcher agreed to use pseudonyms for the company name to preserve the confidentiality of the company.

Moreover, the researcher had to assure that all the participants will remain anonymous and the information they provide will not be revealed or used for any other purposes apart from the research. To start the communication with potential interviewees, the researcher made an effort to identify relevant respondents according to their skills, knowledge and role within the department. Later, an Invitation for Participation in Research Study (Appendix A) was written and emailed to potential research participants, explaining the aim of the research, possible interviewing methods and the rights of the respondents. Also, a special Participation Agreement Form has been created and attached to the e-mail (Appendix B). Also, a separate file was sent, which included the main six question categories of the interview. Each of the six categories had supporting questions to make sure all factors have been considered as well as interviewees understand what topics to cover during the interview (Appendix C). Target interviewees were asked to send back a signed participation agreement form in case they agree to participate in the research study. The majority of the interviewees agreed to provide their input in the research.

When the agreement on the participation has been obtained, the researcher has communicated the preferred mean of the interview. As mentioned in the Research Design section, three methods of data collection were chosen and offered to interviewees: self-administered survey, telephone interview, and face-to-face recorded interview.

Team	Interviewee's Role and Preferred Interviewing Method
NA-ROC	<ul style="list-style-type: none"> • 1 Senior Crisis Manager (Interviewee 1) – Face-To-Face interview • 1 Crisis Manager (Interviewee 2) - Face-To-Face interview • 2 Assistant Crisis Managers (Interviewee 3 and Interviewee 4) – Self-Administered Survey
EU-ROC	<ul style="list-style-type: none"> • 1 Crisis Manager (Interviewee 5) - Face-To-Face interview • 1 Assistant Crisis Manager (Interviewee 6) - Face-To-Face interview
CN-ROC	<ul style="list-style-type: none"> • 1 Crisis Manager (Interviewee 7) – Telephone Interview
ICT Team	<ul style="list-style-type: none"> • ICT Manager (Interviewee 8) - Face-To-Face interview • Program Managers (Interviewee 9 and Interviewee 10) - Face-To-Face interview • Technical Project Managers (Interviewee 11 and Interviewee 12) - Face-To-Face interview

Table 5: The GSCC Interviewees

Self-Administered survey: The main purpose of conducting a self-administered survey was to allow the participants answer the questions without time limitations, pressure or discomfort from the researcher or any other possible constraints.

For anonymity purpose and because of the sensitivity of the research study, the researcher used several unobtrusive approaches to get the answers on the predefined questions. Firstly, emails were sent to respondents with a Word file attached, containing a list of questions.

Secondly, the researcher was given the access to company's internal survey tool, which is intended for simple, small, informal, non-business critical surveys of internal employees.

Telephone Interview: Several respondents expressed a wish to be interviewed via phone due to the lack of time to manually fill the survey. A semi-structured phone interview was scheduled with several interviewees, which allowed the researcher to lead the conversation and ask more questions to get more precise answers and make sure that interviewees focus on interview questions.

Face-To-Face Recorded Interview: Most of the participants agreed to meet the researcher face-to-face to discuss the topic and answer the questions. This method of interview was the most preferred one for the researcher since she would be able to observe the body language and facial expressions and the respondent would be more committed to surveying.

Before the actual interviews, the researcher has prepared for the research interview by practicing it before the actual conduct. She made sure to be familiar with all questions as well as to know the question topic to be able to explain it if the necessity occurs. During the preparation for the telephone and face-to-face interviews, the researcher practiced in asking the question with a neutral tone to avoid any form of bias. Also, a proper wording was prepared prior to the interview to assist the interviewees to elaborate on the question and obtain meaningful information. Moreover, the researcher spent some time on interview planning and agreed with the participants on interview periods

4.4. Actual Interview and Data Processing

The data from the self-administered survey was obtained within four working weeks after sending it to respondents. Unfortunately, none of the respondents has provided all answers to questions. Although the response rate for this type of data collection was low, this was not considered as a problem as the researcher expected to get the main amount of data through a face-to-face interview. The data was provided electronically; therefore, not much time was spent on the capturing provided responses for the further data analysis.

Interviews in case of telephone screening took approximately 25-30 minutes. Unfortunately, the respondents were not very passionate during the phone discussion. To capture the answers, the researcher was taking notes during the call.

Face-to-face interviews took the most of the time. Since the participants who agreed on this type of interview were located in different geographical locations, the major problem was to arrange the meeting. However, the researcher was informed that the GSCC had a planned annual meeting in Phoenix, USA, with all the key influencers of the department. This meeting was a great opportunity for the researcher to meet all the participants in one place. Therefore, she traveled to Phoenix, USA, to interview the respondents.

During the face-to-face interview, a digital recorder was used to capture the answers. This approach helped to eliminate distractions and assisted both interviewee and researcher

to concentrate on the dialogue. It was highly recommended for the researcher to take notes during digital recording due to several reasons. Firstly, an external noise could defect the digital record, while recording several people. Secondly, the researcher did not have a recorder of a high quality. Moreover, the researcher understood that the recorder might not pick up important parts of the conversation due to a simple fact that the interviewee could turn away while answering the question.

Recorded interviews took approximately 30 minutes. Later, to prepare a written report of the record, the researcher transcribed the interview. Since the transcription process is time-consuming, the special computer aided qualitative data analysis software (CAQDAS) was invented to avoid manual transcribing. As this tool was not accessible for the researcher, she transcribed manually only those parts of the interview, which were relevant for the scope of this research.

4.5. Empirical Data

In this section, research findings will be presented. The research was structured basing on IT governance main aspects identified in Section 2.2.2 and enterprise project governance components discussed in Section 2.3. This holistic approach allowed the researcher to obtain information on the current mechanisms of IT governance and project governance within the GSCC. Therefore, the interview covered the following six aspects: portfolio management, strategic alignment, performance measurement, resource management, risk management and value delivery.

4.5.1. Portfolio Management

To get an idea on how portfolios and programmes are managed within the GSCC, the researcher asked the respondents how the decisions on programmes and projects initiation are made and what the role of the stakeholders in this process is. Also, interviewees were asked if the department has a project inventory with all active, proposed and finished projects.

From the interviews, the researcher found out that at the moment there is no single inventory that includes all the projects initiated and delivered within the GSCC. However, the ICT team currently works on creation of projects portfolio to be able to have everything at one place including links to project-related documentation. All team members admitted that many of the standard project management practices are not applied within the department because the ICT team was created ad hoc when the top leadership made the decision to implement several information systems to meet the increased volume of the workload of the GSCC employees. The team did not have time to approach projects according to best practices and had to start implementation of projects to meet tough

deadlines. Moreover, the ICT team expressed their concerns that even after a year within the GSCC, they still cannot find all the documents on the projects implemented before the team was hired.

The ICT team also mentioned the importance of the project planning. When projects start, the team makes sure to involve relevant stakeholders in project decisions making as well as the customers to meet their needs. Interviewees explained that they create a project proposal defining realistic goals, expected benefits, the scope and required resources so that the team would be able to achieve. The proposal is presented to stakeholders for their approval to start the project execution. The team strictly follows the project planning. Although stakeholders are involved in the approval process, the ICT team lacks the commitment of stakeholders throughout the whole project lifecycle.

The interviewee 8 also stated that some projects require the approval from Information Security (InfoSec) department, which sometimes takes more time to start up the project than the team expects it to take. The interviewee explained that the final decision on IT projects from the InfoSec is very crucial since they need to detect and control all types of threats related to digital information.

Interviewee 4 and Interviewee 6 raised their concerns on project initiation and delivery. They think that the ICT team does not always take into consideration the timeline of projects. Interviewees explained that the nature of the GSCC department requires projects to be executed and delivered as soon as possible, however, the ICT team usually takes too long to start up the project. Moreover, a couple of projects did not meet their deadlines, although the major cause was the leadership had changed their priorities.

Interviewee 1 and Interviewee 5 are totally satisfied with the ICT team approach to initiate projects. They mentioned that all project that the team starts up have project proposals that meet stakeholders expectations as well as customers' requirements. However, the interviewees mentioned that they lack regular updates on project progress. Due to changing goals of the GSCC trying to adapt the rapid development of the company, sometimes project baselines are changing. Interviewees would like to have a frequent and proper reporting on the project evolution.

4.5.2. Strategic Alignment

The interviewees were asked to describe the strategic alignment of project portfolio management with the business requirements within the department. To make the topic more understandable, supporting questions were asked to direct the respondents to provide a relevant answer. Research participants were also asked to discuss the importance of strategic alignment of projects within their department, what is done to make sure that stakeholders requirements are met and if ICT-related goals and ICT projects contribute to the department's strategic vision.

All interviewees agreed on the importance of the strategic alignment of projects with business needs. Moreover, they believe that if delivered projects do not meet strategic requirements, they will not be able to assist in ongoing business processes efficiently.

Interviewee 8 explained during the interview - when a project is started, it is made sure that the department's mission is considered. The team is trying to understand what strategic goal is and plans of the stakeholders to make the value of their projects oriented. The respondent also added that it is not easy to conform to multiple stakeholders' needs and sometimes the leadership is not satisfied with the strategy the ICT team chooses to deliver projects. The same respondent thinks it is important that approved projects and what the business requires are aligned. If not so, the mission of the department will fall apart. The respondent explained that TPMs spend much time capturing business requirements and end-user requirements. Moreover, Interviewee 8 mentioned that the team involves all ICT team members in a project kickoff meeting as it is essential to consider their opinions and that appropriate project decisions are made.

Interviewee 11 mentioned that the leadership does not provide a sufficient level of transparency when project-related decisions are made. However, this happens unintentionally. Also, frequently a silo mentality takes place and interferes with project decisions and outcomes. Interviewee 11 explained the three ROCs of the GSCC do not always share information or resources to work towards the achievement of a common goal. Sometimes different ROCs work on the same project without sharing the information with other ROCs.

Interviewee 1 and Interviewee 5 discussed that the department experiences the lack of involvement in overall company's business strategy and that external departments sometimes do not provide necessary information on time. This behavior results in project scope change as well as loss of investments. They mentioned that this is an important factor and the GSCC team has to consider company's strategy and future objectives as a whole to properly plan the GSCC projects. Interviewee 6 added that when project-related decisions are made, the leadership sometimes fails to consider external regulations on time, for example, the EU GDPR (General Data Protection Regulation).

Interviewee 12 explained that there were cases when the leadership was not able to see the alignment of business processes and ICT. The top management was not able to assess the importance of a certain project when an issue was brought up to their attention and therefore failed to prioritize it. Although the issue was acknowledged, no urgent decisions have been made, which led to undesirable consequences.

Interviewee 2 said that the GSCC managers are satisfied with the way projects are delivered and thinks that ICT projects are always aligned with managers' needs. He assessed that probably more than 90% of ICT projects deliver what the leadership expects to see. Interestingly, the ICT team has a slightly different point of view, as they think that project benefits could be much higher than they are now if transparency of the leadership would be better and all the necessary information would be delivered on time.

4.5.3. Performance Measurement

It is crucial to assure that all initiated and delivered projects result in successful benefits. To understand the current state within the GSCC, research participants were asked how project performance is assessed throughout its whole life cycle and if they measure the performance towards predefined targets.

Interviewee 9 mentioned that usually there are no established baselines to measure the progress goals and metrics. However, scheduled weekly meetings help to monitor project deliverables. Moreover, Interviewee 9 explained that although there exist performance standards, because projects within the department differ by nature, size, circumstances and intended end-users, the project team does not always follow the project performance measurement standards. This respondent added that usually delivered projects meet expectations. At the end of the discussion, Interviewee 9 agreed on the importance of having key performance indicators assessment standards.

Interviewee 2 agreed that performance measurement is a very important part of project management and helps the leadership to understand if project decisions that were made became successful. Interviewee 2 also mentioned that the department does not have any tools to measure project milestones outcomes. However, the leadership relies on the experience of project managers. Interviewee 2 also mentioned that it would be great if the leadership would have any means of project performance monitoring. This respondent also added that the projects team does not provide any reports on project changes if, for example, the milestone did not meet the predefined schedule, the leadership cannot make strategic decisions and assess positive or negative effects of the changes. Interviewee 2 expressed the willingness to have any kind of reports presenting the potential impact and providing necessary actions to eliminate negative effects on business goals.

Interviewee 8 explained that the department is in its early development stage and many processes are being established now. Interviewee 8 also mentioned that the team is currently working on project performance measurement process and adapts company-wide accessible tools to assess the key performance indicators at any point of project development. Unfortunately, at the moment the team does not set any project quality criteria for each milestone. However, the schedule is set up, and the team works to meet the schedule, and if there are any deviations from the target scope, the next sprint or next milestone is being reassessed if where possible the time for the next milestone is minimized to meet the overall project deadline. There is no documented agreement on schedule changes. The respondent also talked about the deliverables of milestones. They predefine deliverables along with the schedule but there are no quality measurement practices in the team to verify if the deliverable effectively meets the expectations.

Interviewee 10 stated in the interview that having proper user requirements is essential to ensure project performance at every milestone. The same interviewee raised an issue related to an adequate project resource management and commitment. The interviewee was not satisfied with the level of team involvement at each stage of the project. This respondent

underlined that having team input when project-related tasks are discussed and tasks delivery is estimated is a very important part to ensure the performance. The interviewee mentioned that these factors are usually underestimated within the department.

Interviewee 12 commented that the department lacks experienced staff in project governance. There is a lack of the project management knowledge as well as lack of expertise. The same respondent explained that proper staffing is critical and not having the right people on a projects leads to a failure to successfully deliver results at any stage.

Interviewee 5 had a very good understanding of what is needed to ensure project performance at every stage. This respondent explained that every project needs to begin with a clear estimation of ROI (return on investment) that a project will bring to the business. Also, to get the most value of a project - metrics and other measures should be identified and provided to the leadership to enable them to measure the success as well as to the project team to help them to focus more on what needs to be delivered. Interviewee 5 mentioned that the culture of project governance is relatively new for the department and there is no much experience. However the team is working on shaping mature project performance measurement process.

4.5.4. Resource Management

The participants of the research were asked to describe the process of resource management within the department. To assist the interviewees to deliver the right answers several supporting questions were provided. The researcher asked how the resources for the project are measured, allocated, monitored by the project manager and how resource management impacts their projects.

Interviewee 8 mentioned that the department has limited resources including the insufficient level of time resources, knowledge resources and human resources. However, when a project starts, a resource plan is provided to the leadership describing which resources are needed and when. This respondent added that the top management usually is supportive when there are a reasonable argument and explanation for the requested resources.

Interviewee 9 also identified the lack of all types of resources and mentioned that when a strong case is presented to the leadership, effective resource allocation takes place. This respondent explained how resources are calculated to have a realistic result. Firstly, public holidays and vacations are taken into consideration when the project schedule is estimated. Secondly, availability of potential team members is considered for the whole project duration. Thirdly, project team members are being selected according to required skills.

Interviewee 11 raised an issue of shifting resources. This respondent explained that sometimes project priorities are being changed and due to the lack of human and knowledge resources, project team members are being shifted to different projects. There is no adequate human resource transition process, which leads to project delays.

Interviewee 12 also mentioned that resources are allocated without taking into consideration the priorities and department's goals. Moreover, the respondent added that sometimes human resources are not allocated in an optimal way, meaning that project tasks are not assigned according to skillsets and experienced team members perform easy tasks, while they can be allocated for more challenging activities and bring more value to the department. The respondent raised concern about the meeting the business needs when resources are not utilized properly. The interviewee added that one of the biggest projects that were implemented last year required several enhancements, which were scheduled in the next sprint, but due to reprioritization those enhancements were postponed for more than half of a year. This led to failure to deliver system improvement on time.

Interviewee 10 talked about all the aspects that were mentioned by other interviewees. This respondent also discussed how project-related proposals and documentation are being managed. Interviewee 10 explained that the department is implementing a tool that is used by the whole organization to manage project proposals as well as resource demand documentation and other project-related documents. This helps the team to have a single point of resource utilization documentation and monitor project resources when other projects are initiated. This gives clear visibility of resource availability for the department management and project managers.

4.5.5. Risk Management

The interviewees were asked to discuss the risk management practices applied to project management goal and project change management. Additional questions were asked to direct interviewees to provide necessary information. Supportive questions included the followings: how the department evaluates risk factors before strategic decisions are made and if risks are considered when making decisions; how the department measures risks and if mitigation plans are predefined; does the department assign responsible people to mitigate risks?

Interviewee 1 stated in the interview that there is no actual project risk management practice in the department. Respondent added that although risks occur, they are mitigated in a timely manner as they appear. The personnel recognizes risks very well when something unexpected arises. No predefined mitigation plans take place as well as no risk documentation exist within the department. This interviewee added that they never measure risks and monitor their impact at each project milestone. Moreover, the team has not specific roles who would deal with risks. When risk occurs – whoever is available or capable of dealing with it – that person will be the owner of the risk mitigation.

Interviewee 12 mentioned during the interview that the department is currently working on designing an inventory of known risks, which will include risk identification, analysis, response to the risk, mitigation, monitoring, and controlling plan. Respondent explained

that the department is currently trying to set the path and right direction to run projects correctly, according to best practices and standards.

Interviewee 8 also agreed that at the moment there is no risk management culture implemented in the department. The respondent added - the team has identified the importance of having the risk management plan. Also, Interviewee 8 mentioned that although one of the biggest projects implemented last year did not have any risk plan documentation, the risks and their potential impacts were identified (without documenting them) in advance and the whole project team worked on addressing those risks as their likelihood was increasing. The project was delivered, however, the project team was not able to meet the specified product timeframe.

Interviewee 5 and Interviewee 7 have expressed their concerns about the risk assessment of the GSCC information systems. They admitted that have never thought about this aspect but would like to know if the business processes that are supported by the information systems are at the risk and how critical those risks are. Interviewees also mentioned that would like to be actively involved in the risk mitigation process.

Interviewee 11 raised a concern regarding the end-user experience. The respondent explained that often the ICT team faces the end-user system acceptance problem. Many BCAs are not supportive of new information systems implementation that is aimed at business process optimization. This is one of the biggest risks the GSCC ICT team has to deal with on a regular basis.

4.5.6. Value Delivery

To assess the success of projects delivered in the GSCC, the researcher asked the respondents benefit-delivery-related questions. Some questions that were asked within this category were how the team monitors acceptance criteria of projects and if they calculate ROI. Also, the respondents were asked about the current quality management (QM) processes and if value delivery is focused on stakeholders and customers.

Interviewee 8 explained that value delivery of projects is very closely related to performance management. If the performance of the project is measured at each stage of the project, then the effectiveness and acceptance criteria are also measured. The process of evaluating all project milestones towards the acceptance criteria and ensuring the criteria are met - will contribute to project benefit delivery. However, at the moment there is no proper performance management practices and as a result – no proper value delivery assessment. This interviewee also added that the ICT team usually creates system user acceptance criteria file as a quality management process and tests the information system before launching it on production. The team does not have specific roles to perform the quality assurance activities. BCAs, TPMs and PMs do system testing when they have some free time. Moreover, there are no predefined QM plans for project-related processes or a habit to collect the project lessons learned. Quality management standards are not defined

as well, because the department does not have any best practices adopted or frameworks that will help to apply industry best practices to perform quality activities. He admits that this practice is not the best; however, due to time constraints and frequently changing requirements, the team has to adapt to the environment and maximally quickly deliver ICT projects. Interviewee 8 also mentioned that within the rapidly changing business requirements, it is challenging to calculate ROI and present it to stakeholders. ROI plays a crucial part when it comes to projects prioritization and support from the leadership.

The whole ICT team also raised an issue related to resources. The team explained that the GSCC does not have enough resources to test properly the ongoing project to manage quality at each stage of the project. Moreover, the team clearly understands that project value delivery is related to not only resource management but also performance management and risk management. The ICT team is sure, when all the mentioned aspects will be fully addressed and implemented as a part of project governance, the value delivery will be easier to monitor and predict.

Interviewee 11 and Interviewee 12 brought up a different problem when discussing value delivery in project governance. Interviewees mentioned that the requirements provided by the business represent the biggest challenge to assure a project value delivery. Firstly, requirements are vague or lack end-users involvement, and secondly, business requirements do not have a holistic vision to allow the ICT team ensure the final product reflects business demands. These interviewees highlighted that if end-users and stakeholders actively participate throughout project execution, the project value delivery will be easier to assure and the ICT system will be aligned with the business strategy, stakeholders' expectation and be focused on customers.

Interviewee 5 thinks that value delivery is primarily technical project managers' and program managers' responsibility. The respondent explained that the ICT team should understand the goal and should be vigilant if the project does not meet the stakeholders' requirements. However, when the researcher asked if the projects team the right tools and enough resources to ensure the value delivery, the interviewee did not know if there was a need to allocate resources for the quality and risk management processes.

4.6. Findings

In the previous sections, the evidence collected by interviewing the GSCC team was presented. This section will focus on the analysis of answers to the six categories of research questions and the main research question.

After the data was collected through interviews, the researcher extracted the evidence categorizing it according to ITG and PG main aspects. The tables in the Section 4.6.1 summarize all positive and negative factors of the portfolio management, strategic alignment, performance management, resource management, risk management and value delivery key aspects within the GSCC. This summary will be later discussed with the

GSCC ICT team to answer the main research question - *What can be done to improve the Project Governance within the business unit?*

4.6.1. Answers to Six Categories of Supporting Questions

As discussed in Chapter 3, the researcher has structured the interview questions in six categories, based on the ITG and PG key aspects, discussed in the literature review. The tables below provide the answers to the supporting questions of the portfolio management, strategic alignment, performance management, resource management, risk management and value delivery categories.

ITG and PG Aspects	
Portfolio Management	
Positive Factors	Negative Factor
<ul style="list-style-type: none"> Stakeholders involvement in project proposals approval stage Projects are executed according to project planning InfoSec approval process 	<ul style="list-style-type: none"> No single project inventory (working on creation) Lack of leadership commitment throughout project execution lifecycle A misunderstanding between stakeholders and ICT team on project baselining No regular reports on project progress Several projects failed to meet the deadlines
Supporting Questions	Answers
1. Do you have a project inventory that includes all ongoing, proposed and finished programmes/projects?	Although there is no single project inventory, the team is currently working on its creation. No recorded documentation of the projects implemented before the GSCC ICT team was created. Leadership lacks project-progress-related updates and milestones reporting.
2. How do you initiate a programme? Do you usually define a programme plan? What do you include in your programme planning?	To initiate the project the team creates a project proposal including goals, benefits, scope and resources. The project plan is also defined. All projects go through InfoSec approval. Senior leadership is satisfied with the project initiation/planning process. Not all stakeholders are satisfied with project baselining and several projects failed to meet the deadlines
3. How do you initiate projects within your programme or portfolio? Are stakeholders engaged in project initiation and approval stage?	At the moment, no project portfolio exist within the GSCC. However, the top leadership is engaged in project initiation and approval process, but the team lacks their commitment throughout the project.

Table 6: Research Questions Category1: Portfolio Management

ITG and PG Aspect	
Strategic Alignment	
Positive Factors	Negative Factor
<ul style="list-style-type: none"> • Project team members involved in project kickoff meeting • Department's mission is considered before the project is started • Business requirements are captured 	<ul style="list-style-type: none"> • No sufficient level of leadership transparency on project-related decisions • Silo mentality in the ROCs • Lack of the GSCC involvement in overall company's strategy • Lack of information from other departments • Failing to meet external regulations on time • Duplication of project activities • Failure to prioritize projects • The projects can deliver better results • Different views on strategic alignment of project
Supporting Questions	Answers
1. How do you select the strategy to align the ICT project with the business case?	The mission of the GSCC is taken into consideration when a project is kicked off. Strategic goal and plans are understood.
2. What is done to make sure that projects are aligned with business requests?	ICT team spends the time to understand business demands and end-user requirements. However, the team raised issues such as insufficient level of leadership transparency when projects are initiated. Also, other departments do not provide strategic decisions on-time and the GSCC ROCs tend to work in silo and duplicate project efforts. Not all external regulations are considered which also leads to failure to align to the business goals.
3. How much the stakeholders are satisfied with the scope of the planned ICT project and with the delivered project? Are all projects fully aligned with their business needs?	The team mentioned that multiple stakeholders have different needs and it's difficult to meet all of them. Sometimes the leadership is not happy about the strategy the ICT team chooses to implement projects. At the same time, one of the high-level managers in GSCC thinks that the projects are aligned with strategy and bring value. However, the ICT team tends to think that projects could be more aligned with business needs if the leadership was transparent and all the strategic information was delivered on time.

Table 7: Research Questions Category2: Strategy Alignment

ITG and PG Aspect	
Performance Measurement	
Positive Factors	Negative Factor
<ul style="list-style-type: none"> Weekly meeting to monitor deliverables progress Delivered projects are likely to meet expectations The team works on mature project performance measurement process. 	<ul style="list-style-type: none"> No predefined performance criteria No performance measurement processes Project deliverables and milestones are not assessed against the quality criteria No reports on performance deviations No reports with proposed actions to minimize the negative impact of project performance change No documented agreements on project changes Lack of proper user requirements definition Lack of end-users and human resource commitment Lack of project governance knowledge and experience
Supporting Questions	Answers
1. Is project performance criteria predefined for each milestone? How do you measure the performance?	No performance indicators are set in project planning stage and no milestone has predefined performance criteria. The only criteria the team sets is the schedule and deliverables. Milestone deliverables are not assessed against the quality expectations. The team has weekly meetings to monitor the progress of deliverables. Some interviewees say that delivered projects are likely to meet expectations.
2. What do you do if you have any deviations in performance indicators?	If the schedule is missed, the team tries to minimize the next milestone schedule to meet the project deadline. The team does not provide any reports on performance deviations to the leadership. The top management wants to have project-related change reports and necessary actions to minimize negative effects of project changes. Moreover, the team does not document any project changes that occur due to performance deviations.
3. What are the main issues that prevent projects to meet performance criteria?	Interviewees raised improper user requirements as the major issue to predefine performance criteria for the project. Also, human resource management and team members commitment lead to failure of performance assurance. Interviewee 5 said that the team lacks the project governance knowledge and experience but works on shaping mature project performance measurement process.

Table 8: Research Questions Category3: Performance Management

ITG and PG Aspect	
Resource Management	
Positive Factors	Negative Factor
<ul style="list-style-type: none"> Leadership is supportive and allocates resources when necessary 	<ul style="list-style-type: none"> Lack of resources of all types No adequate human resource transition process Human resources shifting disregarding the GSCC priorities

<ul style="list-style-type: none"> Implementation of a single-point of resource documentation 	<ul style="list-style-type: none"> No optimal human resource allocation process Disability to meet business requirements due to inadequate resource utilization
Supporting Questions	Answers
1. How human resources within the project are planned, allocated and measured?	When a project starts, the resource planning is made including human resources. If the requested resources are reasonable, the leadership provides them. Then, the resources are calculated taking into account public holidays and availability. Also, required skills are considered. However, there is a problem with shifting resources and team members are frequently transitioned by the top leadership into other projects, disregarding the GSCC project priorities. Another issue is that team members are assigned with tasks without considering their skills and appropriate task complexity.
2. Can ICT team meet business needs of the department with available resources?	Although the leadership supports the team and allocates the requested resources, the ICT team is not satisfied with the way resources are utilized, which has already led to not meeting business needs.
3. How project-related proposals and documentation are managed?	The GSCC has no single point for storing project-related documentation. However, the team is working on the adoption of internal tool for document management.

Table 9: Research Questions Category4: Resource Management

ITG and PG Aspect	
Risk Management	
Positive Factors	Negative Factor
<ul style="list-style-type: none"> Working on risk inventory implementation Manage to identify and sometimes avoid arisen risks 	<ul style="list-style-type: none"> No adopted risk management practices No risk inventory No predefined risks and their mitigation planning No project-related risk assessment throughout the whole project lifecycle Failed project deadlines due to arisen risks No roles assigned to mitigate risks No documentation of critical business processes risk assessment and mitigation planning End-users are not ready to accept new IT systems
Supporting Questions	Answers

1. Do you evaluate ICT/IT risk factors in advance of pending strategic enterprise decisions and ensure that decisions are being made considering those risks? Do you have risk register?	At the moment, the team does not evaluate any risk factors prior to launching a new project. Moreover, the team does not have a risk register. They have no best practices adopted including the practice of having risk inventory. However, they are working on its implementation and it will include risk expected frequency, impact, response and mitigation planning.
2. How do you measure risks throughout the project lifecycle (metrics, against targets)? Do you know if any of your business processes supported by IT are under the risk?	There is no risk measurement practice throughout the whole project lifecycle. No metrics or targets are determined. However, the GSCC says the team recognizes risks very well when it arises. Moreover, The team does not have a log of risks related to implemented IT systems. The leadership never thought of business process risks before but is willing to support any risk mitigation plans. One of the interviewees mentioned that although with one of the projects, they managed to avoid risks, the project failed to meet the deadlines.
3. What type of risks you usually face? Do you assign people to mitigate those risks?	One of the often-occurred risks in the GSCC is end-user acceptance of the system. The team is not supportive when new systems are implemented. The team has no specific roles assigned to mitigate risk. When the risk arises – the one who is available deals with the risk.

Table 10: Research Questions Category5: Risk Management

ITG and PG Aspect	
Value Delivery	
Positive Factors	Negative Factor
	<ul style="list-style-type: none"> • No QM planning process • No lessons learned reports • No QMS or industry best practices used to perform QM activities • No assigned roles for project quality assurance • No sufficient resources for risk management, human resource management and performance management to assure value delivery • Difficulties to predict ROI due to rapidly changing requirements • Vague project requirements to assure project benefits • Top-leadership does not realize its role in project value delivery • Top leadership is not aware of the lack of resources needed to ensure value delivery
Supporting Questions	Answers

1. Do you define any quality management (QM) plans for projects? Do you define quality management systems (QMS)?	The GSCC business unit does not have any quality management planning processes as well as lessons learned reports. No QMS defined and no best practice frameworks are adopted to apply industry best practice to perform QM activities.
2. Do you have assigned roles for project quality assurance (QA)?	The GSCC does not have roles assigned to quality assurance. ICT team members do testing when have time. The team does not have enough resources for QA activities.
3. Do you calculate return on investment (ROI)? What are the challenges to ensure value delivery in the GSCC?	The team finds it challenging to calculate the ROI due to frequently changing the environment in the company. Moreover, insufficient resources, improper risk management and poor performance management lead to difficulties to ensure value delivery. Another challenge is that the leadership thinks that value delivery is primarily ICT team responsibility. The leadership of the GSCC was not aware of the lack of resources for risk and quality management process. Vague project requirements challenge the value delivery as well.

Table 11: Research Questions Category6: Value Delivery

4.6.2. Analysis of Evidence Collected from the Six Categories of Questions

In this section, the researcher will provide analysis of answers obtained through the interviews. She will discuss how the key aspects of the ITG and PG influence the governance of ICT projects within the GSCC.

Portfolio Management: Based on the obtained information, the researcher believes that having a proper portfolio management and related best practices in place will help the team to evaluate and prioritize programmes and projects that have strategic importance within the department. Moreover, the raised issue of the leadership involved in projects will be eliminated if the team will follow the best practice of maintaining the portfolio and involve the leadership in the portfolio/programme/project initiation from the first place. By providing the leadership, a good understanding of the importance of their commitment when programmes are selected and project priorities are being assigned will remove the communication problem and eliminate the identified problem of the GSCC – misunderstanding between stakeholders and ICT projects team. The researcher thinks that

having all the aspects mentioned above will create a trustful environment both for the leadership and for the ICT project team. The researcher also believes that one of the first steps to leadership commitment and engagement at all stages of the portfolio management is to provide a regular reporting on the projects/programmes status within the portfolio. This best practice will help to keep the leadership up-to-date on any proposed and finished projects within the portfolio.

Strategic Alignment: After the analysis of the strategic alignment aspect within the GSCC, the researcher believes, if the department will work on this key aspect, it will be able to provide the leadership a holistic view of IT, ICT projects and their alignment with business needs. Moreover, a proper strategic alignment will help the GSCC team to move in the same direction, eliminating misunderstandings of enterprise objectives. The researcher thinks that if the GSCC business goals will be aligned with the ICT strategy, the ICT projects team will be able to ensure project value delivery. This will also make sure that project-related investments, costs and resources are utilized adequately. By ensuring the strategic alignment of projects with the department's objectives, the GSCC will eliminate identified issues, such as duplication of projects and silo mentality. One of the most important factors of the strategic alignment is the transparency of the leadership during project-related decision-making. This will help the ICT projects team to use for awareness of the business goals and plan the ICT project strategy in a right direction as well as will help to consider external regulation in a timely manner and minimize negative effects of not meeting the requirements.

Performance Measurement: The GSCC has a good understanding of the importance of this ITG/PG key aspect and its close relation with the business value delivery. The researcher advises the ICT team to implement the best practices of the project performance management and periodically monitor project execution process. Project performance assessment against the predefined indicators, such as schedule, cost, quality, and goals, will help the team to control any deviations and act promptly upon their occurrence. This will also help to avoid a failure to deliver projects on time, in the budget and accordance with expected capabilities. Regular project performance reviews and project change reports will enable the leadership to make project-adjustment-related decisions timely and ensure the proposed project changes support business needs.

Resource Management: The researcher believes that properly adopted resource management aspect will allow the GSCC to meet their business goals and assure the department is capable to support business processes. The GSCC should have a structured approach to human resource management, including appropriate staffing, defined responsibilities and some backup planning for project team members transitioning to new roles or into another project. Moreover, it is important for the GSCC to constantly develop their personnel and ensure that the personnel maintains their skills and knowledge. Resource management also will help the team focus on IT resource budget and cost. The ICT team will be able to effectively utilize IT-related resources with better transparency

on the cost of IT solutions. Resource management also includes project-related documentation management. The documenting practice and storage of these reports in a single location will help the team to be more efficient with project management activities.

Risk Management: Based on the interview results, the researcher would advise the GSCC to implement risk management as one of the priorities. This will help them to identify and analyze potential risks and develop necessary remedial actions planning and business impact analysis. Applying risk management best practices, the team will be able to measure threats, evaluate their frequency and losses related to their occurrence. Predefining potential risks will help the ICT team to prepare to address those at any phase of ICT project and define the best response avoiding negative impacts. Moreover, the researcher would recommend the ICT team to implement a register of known business processes and IT systems risks including all relevant information for the disaster recovery case. Having this practice implemented will keep the leadership up-to-date on existent IT-related risks and will ensure immediate support from the top management if the risk occurs.

Value Delivery: The interview analysis has shown that value delivery aspect is very poorly adopted within the GSCC. The researcher recommends the ICT projects team to pay more attention when discussing the business and end-user requirements for the project and ensure those requirements are aligned with quality metrics. Implemented quality management systems (QMS) will enable a holistic approach to quality management (QM) of IT and business activities. The good practices of the value delivery aspect will allow the ICT team to request a proper resource allocation for QM from the leadership. This will help to define quality management planning and assign specific roles responsible for quality assurance and its alignment with predefined metrics and criteria. Also, ITG aspect advises the ICT projects team to have continuous quality reviews and recommends execution QM performance analysis for future improvement. All the mentioned above aspects will ensure that the GSCC stakeholders will have consistent project value delivery by meeting business objectives and quality requirements

Stakeholder Management: Although the researcher has not prepared a certain category of questions particularly related to stakeholder management, the answers that the interviewees have provided have revealed this aspect as one of the major issues of the GSCC project management activities. Essentially stakeholder management represents one of the major concepts of the enterprise PG. The researcher advises the GSCC spend more time on building trustful environment between the project team and stakeholders. A proper stakeholder management culture will guarantee the effectiveness of the communication with stakeholders and eliminate existing problems of the ICT team, such as vague and unclear project requirements, transparency on the strategic direction of the department. Moreover, engaging stakeholders from the very beginning of the project will enable them to understand their role in project value delivery and keep them committed to work towards the project benefits realization. Stakeholder management aspect will remove the existing silo mentality between the ROCs and prevent the duplication of projects.

4.6.3. Answers to the Main Research Question

When the summary on the ITG and PG aspects-related questions was finished and analyzed based on the evidence provided during the interview with the GSCC, the researcher scheduled a meeting with the GSCC ICT team to discuss the findings and find the answer to the main research question. The researcher reached out to the GSCC ICT manager via e-mail and sent the findings presented in Section 4.6.1 and Section 4.6.2 as attachments. The researcher asked if the ICT team would be available in the following days to discuss the findings. In two working days the ICT manager has replied via email and scheduled a conference call with the researcher.

During the conference call, the researcher has discussed the findings, which were supported by the information provided by the GSCC team during the interview. The ICT manager agreed with all identified gaps in the GSCC PG practices and admitted the importance of the ITG and PG key aspects adoption in the team. Therefore, to answer the main research question “*What can be done to improve the Project Governance?*”, the researcher and the ICT manager decided to assign statuses to the ITG and PG aspects that were discussed during the interview. The following statuses were defined:

- Does Not Need Improvement
- Needs Improvement
- Needs Significant Improvement

Based on the evidence and analysis of questions classified in the six categories as well as identified lack of stakeholder management culture, the statuses were assigned in the following way:

ITG/PG Key Aspects	Assigned Status
Stakeholder Management	Needs Improvement
Portfolio Management	Needs Significant Improvement
Strategic Alignment	Needs Improvement
Performance Measurement	Needs Significant Improvement
Resource Management	Needs Improvement
Risk Management	Needs Significant Improvement
Value Delivery	Needs Significant Improvement

Table 12. ITG/PG Key Aspects Statuses in the GSCC

Therefore, to answer the main question of the topic, the ICT manager agreed that all the ITG and PG key aspects that the literature provides and the researcher analyzed through interviews within the GSCC should be addressed. Moreover, he admitted that an appropriate PG framework has to be adopted to eliminate current project management issues and to ensure the ICT team is enabled to deliver maximum value to the business.

4.7. Summary

The current chapter reported the findings of the research study performed in one of the business units of the sample company – the GSCC. Research process was based on the methodology described in Chapter 3. The researcher has performed unstructured interviews and assessed the collected results. To examine how well the projects are aligned with business strategy in the GSCC, the researcher created a questionnaire based on the important aspects of ITG and PG that were covered in the literature review. Interview questions were divided into six categories: portfolio management, strategic alignment, performance measurement, resource management, risk management and value delivery. The goal to categorize the questions into mentioned groups was to understand the maturity of PG and ITG level in the GSCC. This approach helped the researcher to identify if stakeholders' expectations are met, resources are managed and optimized, potential risks are mitigated and project acceptance criteria are measured. To identify existing problems and acknowledge the importance of ICT in business strategy as well as to ensure that implemented IT systems and delivered projects are capable of supporting department's operations, the researcher analyzed the information to assess the outcomes. The findings obtained through the interviews have provided a huge value to answer the main research question. The key factors for successful ITG and PG were evaluated. Moreover, the stakeholder management aspect, which was not specifically included in the research questions categories, has been identified as one of the problematic areas along with the rest six aspects. As a result, the researcher has identified that proper portfolio management will enable GSCC stakeholders to obtain a broad view of all projects. To ensure the ICT projects are consistent with the department goals and objectives, strategic alignment aspect will play a crucial role. Project-related resource management best practices will assist in a better control and utilization of the IT-related investments as well as human resource adequate staffing. To avoid ICT projects failures and ensure the expectations are met, performance measurement activities should be adopted. Additionally, QM activities will provide consistent project value delivery and help to meet business objectives and quality requirements. Risk management culture should be adopted as one of the priorities for the GSCC ICT project governance. This will help them to identify and analyze potential ICT related risks and develop necessary remedial actions planning and associated business impact analysis. Stakeholder management and their commitment throughout the whole project will ensure transparency in project decision-making and create a trustful environment for PG. These seven factors were identified as the major influencers and represent highly desirable aspects when it comes to project governance improvement.

5. RECOMMENDATIONS AND CONCLUSIONS

In Chapter 4, the researcher discussed research findings by providing evidence obtained during the interviews with the GSCC team. Later, the seven key concepts of the ITG and PG were identified as to be improved in order to ensure a better PG environment in the GSCC. Based on the results and analysis of portfolio management, strategic alignment, performance measurement, resource management, risk management and value delivery aspects, including the identified during the actual interview issue with the stakeholder management aspect, the ICT manager answered the main research question – *What can be done to improve the Project Governance?* To provide the response to the question, ICT manager assigned statuses to the seven ITG and PG categories. He identified that to improve the ITG and PG within the GSCC, all of the seven categories need to be addressed. In this chapter, the researcher will find and recommend the suitable approach to improve the examined ITG and PG aspects to help the chosen sample business unit to improve its ICT project management practices. Therefore, the researcher will focus on the implementation of COBIT 5 process - BAI01 Manage Programmes and Projects as the good practice to improve the factors that influence PG in the GSCC.

Firstly, Section 5.1 sets the roadmap for the PG improvement. Then, Section 5.1.1, Section 5.1.2, Section 5.1.3, and Section 5.1.4 describe the roadmap phases. Section 5.1.1 recommends the GSCC to adopt COBIT 5 as framework for the PG improvement and explains why this ISACA framework would be beneficial for the team. Section 5.1.2 focuses on the obtaining the leadership approval phase and later elaborates on the BAI01 process identification by applying COBIT5 goals cascade in Section 5.1.2.1. Section 5.1.2.2 focuses on the prioritized process capability level assessment to show the top leadership the necessity for process improvement. Section 5.1.2.3 prepares a business case for the leadership to obtain the BAI01 implementation approval. Section 5.1.3 plans the implementation phase and tailors the BAI01 management practices and RACI chart to the GSCC environment. Section 5.1.4 focuses on the actual implementation phase and provides approximate dates to finalize the adoption. Section 5.2 identifies existing limitations of the research, while Section 5.3 recommends further development opportunities. Finally, in Section 5.4 conclusions are made.

5.1. Framework Adoption Roadmap

As discussed in the literature review, there are many frameworks and best practices that can help to improve the PG. The adoption of frameworks and best industry practices depend on the nature of the business, the size of the enterprise and the practices adopted enterprise-wide. The holistic approach applying ITG/PG main aspects to identify what PG issues the GSCC is facing has provided a good understanding of what needs to be done to

improve the PG within the GSCC. Based on the findings, in this chapter the researcher will identify and recommend the suitable framework for the GSCC.

To find the way to improve the PG within the GSCC, the researcher and the ICT manager decided to design a roadmap for improvement of each of the ITG/PG key factors that were subjects of research within the scope of this thesis. The following phases were defined for the adoption of the best suitable framework for the GSCC:

- Phase 1: Choosing a framework
- Phase 2: Present a business case to the leadership for approval of the framework adoption
- Phase 3: Implementation planning
- Phase 4: Implementation

Section 5.1.1, Section 5.1.2 , Section 5.1.3, and Section 5.1.4 will provide more information on the development of each phase.

5.1.1. Phase 1: Why COBIT 5

IT is an essential part of the Company X and plays a vital role in enterprise value generation, risk optimization and business performance. For obvious reasons the GSCC spends significant efforts to manage IT-related projects and makes sure IT is aligned with enterprise strategy and delivers value. However, because of the rapid expansion of the GSCC team as well as the rapid development and implementation of IT solutions for the team, without the best practices and adequate ITG and PG frameworks put in place, it is difficult to monitor and ensure the success of ICT projects managed in the GSCC. When interviewing the team, the lack of the best practices and frameworks was identified as one of the challenges within the department. Therefore, it is highly recommended to apply standard ITG and PG practices to maximize the GSCC's efficiency. Moreover, implementation of the appropriate frameworks will eliminate identified issues with the ITG and PG aspects: portfolio management, strategic alignment, performance measurement, resource management, risk management, value delivery and stakeholder management. There are several ITG frameworks available nowadays, which can guide the GSCC how to adapt and optimize IT processes. In the literature review, the researcher has discussed some of the well-known ITG and PG frameworks and best practices, such as ITIL, COBIT 5, PMBOK and PRINCE2. However, when choosing an appropriate approach for the GSCC team, experience with any of the ITG and PG frameworks was considered. Since the team has no experience with any of the listed frameworks or best practices, to address PG issues within the department, the researcher offered to apply her knowledge and experience in COBIT 5, gained within the university studies. Based on the research findings and analysis, the researcher will direct the GSCC ICT team and leadership to help them to identify

stakeholders' needs using COBIT 5 framework. Moreover, this framework will help the team to improve both governance and management activities and will enable the GSCC to find and prioritize major processes that need to be implemented to align IT and IT project with the business strategy. With COBIT 5, the GSCC team will be able to implement one process at a time, improving the maturity level of ITG and PG within the department step-by-step.

5.1.2. Phase 2: Obtaining the Leadership Approval

To gain the support of the GSCC leadership for the COBIT 5 framework implementation, it was decided to present a proper business case. To buy-in the top management, the researcher decided to use *COBIT 5: Enabling Processes* (ISACA, 2012f) and *COBIT 5: A Business Framework for the Governance and Management of Enterprise IT* (ISACA, 2012c) guides. Using ISACA documentation, firstly, the researcher has applied goals cascade to identify COBIT 5 processes to be improved and performed self-assessment of the process that was prioritized by the GSCC ICT manager. The business case was developed to obtain the managerial approval.

5.1.2.1. BAI01 Process Identification

To start, the researcher together with the ICT manager has identified stakeholders' needs by using COBIT 5 Goals Cascade (ISACA, 2012c). Since the major scope of the current thesis is project governance, the following stakeholders' question was prioritized: *Do IT projects fail to deliver what they promised and if so, why? Is IT standing in the way of executing business strategy?*

The researcher used COBIT 5 Goals Cascade to translate stakeholders' needs into enterprise goals and then map the enterprise goals with the IT-related goals. Later, following the COBIT 5 instructions, the researcher mapped IT-related goals with COBIT 5 process. Applying this logic, the researcher together with the GSCC stakeholders and ICT team have prioritized a *BAI01 Manage Programmes and Projects* process for its further improvement.

The table below provides COBIT 5 enterprise goals mapped to stakeholders' prioritized question, which were later mapped to IT-related goals (ISACA, 2012c):

Enterprise Goals	1 - Stakeholder value of business investments	2 - Portfolio of competitive products and services	3 - Managed business risk (safeguarding of assets)	8 - Agile response to a changing business environment	11 - Optimisation of business process functionality	12 - Optimisation of business process costs	13 - Managed change programmes
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IT-related Goals	01 Alignment of IT and business strategy	01 Alignment of IT and business strategy	04 Managed IT-related business risk	01 Alignment of IT and business strategy	01 Alignment of IT and business strategy	05 Realised benefits from IT-enabled investments and services portfolio	01 Alignment of IT and business strategy
	03 Commitment of executive management for making IT-related decisions	05 Realised benefits from IT-enabled investments and services portfolio	10 Security of information, processing infrastructure and applications	07 Delivery of IT services in line with business requirements	07 Delivery of IT services in line with business requirements	06 Transparency of IT costs, benefits and risk	03 Commitment of executive management for making IT-related decisions
	05 Realised benefits from IT-enabled investments and services portfolio	07 Delivery of IT services in line with business requirements	16 Competent and motivated business and IT personnel	08 Adequate use of applications, information and technology solutions	08 Adequate use of applications, information and technology solutions	11 Optimisation of IT assets, resources and capabilities	13 Delivery of programmes delivering benefits, on time, on budget and meeting requirements and quality standards
	07 Delivery of IT services in line with business Requirements	09 IT agility		09 IT agility	09 IT agility		
	11 Optimisation of IT assets, resources and capabilities	12 Enablement and support of business processes by integrating applications and technology into business processes		17 Knowledge, expertise and initiatives for business innovation	12 Enablement and support of business processes by integrating applications and technology into business processes		
	13 Delivery of programmes delivering benefits, on time, on budget and meeting requirements and quality standards	17 Knowledge, expertise and initiatives for business innovation					

Table 13: Enterprise and IT-Related Goals Mapping

The next step was IT goal prioritization. The highest priorities were given to the following three IT-related goals:

- 01 - Alignment of IT and business strategy
- 04 - Managed IT-related business risk
- 13 - Delivery of programmes delivering benefits, on time, on budget and meeting requirements and quality standards

After prioritization of IT-related goals, the researcher performed mapping of IT-related goals and COBIT 5 processes. Mapped processes are shown in the table below (ISACA, 2012c):

IT-related Goals	01 - Alignment of IT and business strategy	04 - Managed IT-related business risk	13 - Delivery of programmes delivering benefits, on time, on budget and meeting requirements and quality standards
COBIT 5 Processes	EDM01 - Ensure Governance Framework Setting and Maintenance	EDM03 – Ensure Risk Optimization APO10 - Manage Suppliers	APO05 - Manage Portfolio
	EDM02 - Ensure Benefits Delivery	APO12 – Manage Risk APO13 - Manage Security	APO07 - Manage Human Resources
	APO01 - Manage the IT Management Framework	BAI01 - Manage Programmes and Projects	APO11 - Manage Quality
	APO02 - Manage Strategy	BAI06 - Manage Changes	APO12 - Manage Risk
	APO03 - Manage Enterprise Architecture	DSS01 - Manage Operations DSS03 - Manage Problems	BAI01 - Manage Programmes and Projects
	APO05 - Manage Portfolio	DSS04 - Manage Continuity DSS05 – Manage Security Services	BAI05 - Manage Organizational Change Enablement
	APO07 - Manage Human Resources	DSS06 - Manage Business Process Controls	
	APO08 - Manage Relationships	MEA01 - Monitor, Evaluate and Assess Performance and Conformance	
	BAI01 - Manage Programmes and Projects	MEA02 – Monitor, Evaluate and Assess the System of Internal Control	
	BAI02 - Manage Requirements Definition	MEA03 Monitor, Evaluate and Assess Compliance With External Requirements	

Table 14: IT-Related Processes and COBIT 5 Processes Mapping

Due to limited resources and time constraints, the researcher together with the ICT manager decided to approach one process at a time. The researcher offered to choose the process by prioritization. Therefore, based on the scope of this thesis and process prioritization, the ICT manager decided to pay more attention and improve *BAI01 Manage Programmes and Projects* process, which was assigned as a process enabler. This process was chosen as one of the biggest challenges of the GSCC is project governance, and its

intention is to maximize project benefits by minimizing project-related risks, and to ensure ICT projects alignment with the GSCC objectives.

5.1.2.2. BAI01 Self-assessment

The main purpose to undertake the PG improvement is to make sure that all IT-related processes have appropriate capability levels within the GSCC. As discussed in Section 2.8.5, ISACA offers a *COBIT 5 Implementation* guide, which allows enterprises to implement IR-related processes following the seven phases of the implementation lifecycle. Due to the time limitations and thesis submission deadline, the researcher did not apply the COBIT 5 implementation, but used a less rigorous way of the BAI01 process adoption.

Therefore, the next step for obtaining the leadership's approval on COBIT 5 BAI01 process implementation was to show them the current capability level of the BAI01 and the space for its improvement. The goal is to demonstrate the top management that with an increased capability level, the GSCC can be ensured in the improvement of PG and ITG aspects, which were assessed during the interview. To assess the capability level of the BAI01 Manage Programmes and Projects process, the researcher used a *Self-Assessment Guide: Using COBIT 5*.

To perform a self-assessment of the prioritized process, a *Self-assessment Excel Template* from COBIT 5 Process Assessment Model Tool Kit was used. This PAM tool includes separate evaluation sheets for all 37 COBIT 5 processes (ISACA, 2013c). According to instructions, the researcher together with the GSCC ICT manager undertook the prioritized BAI01 process assessment. The assessment started with the Level 1 capability, as this is the step when detailed questions about BAI01 outcomes and purpose are asked. The researcher with the assistance of the ICT manager answered "Yes" or "No" if each process outcome criteria were met and added relevant comments to support their judgement. The overall assessment for the Level 1 capability was evaluated as Largely Achieved. Then, capability for levels 2 to 5 was assessed. In this case, the researcher focused only on overall generic goals for each level. For Level 2 capability, the process attributes 2.1 and 2.2 were assessed as Partially Achieved. As the Self-Assessment guide says, to pass a process level, it must be rated as Largely or Fully capable, but to move to the next level, process attributes should be Fully capable (ISACA, 2013b). For this case, the GSCC department has only passed Level 1 assessment, which means that the capability level of the BAI01 process that is achieved within the GSCC is equal to 1.

The table below shows the process assessment results summary. Appendix D provides the full self-assessment process.

Process Name	Process Capability Level											
	To Be Assessed	Target Level	0	1	2	3	4	5				
BAI01 Manage Programmes and Projects	✓			PA 1.1	PA 2.1	PA 2.2	PA 3.1	PA 3.2	PA 4.1	PA 4.2	PA 5.1	PA 5.2
Rating By Criteria				L	P	P						
Capability Level Achieved				1								
Legend: N (Not Achieved, 0-15%) P (Partially Achieved, >15%-50%) L (Largely Achieved, > 50% - 85%) F (Fully Achieved, >85%-100%)												

Table 15: BAI01 Process Capability Assessment

5.1.2.3. The GSCC Leadership Approval on BAI01 Process Implementation

After the researcher together with the ICT manager prioritized the stakeholders' need, applied COBIT 5 goals cascade to identify and prioritize COBIT 5 process for the further implementation, the capability level of the BAI01 process was assessed. The next step was to document the business case and send it to the GSCC leadership for implementation approval.

The researcher together with the ICT manager have prepared a business case. Due to the anonymity purpose, the document with the business case will not be provided. However, the researcher will provide a structure and the content of the white paper, prepared to buy in the GSCC top managers. The following sections were included in the business case document:

1. The Problem Definition – in this section the information described in the 4.2 was provided to give the leadership a good understanding why this whole process is required.
2. The GSCC Pain Points – here the researcher and the ICT manager provided the analysis of the collected evidence from the research interviews. All business challenges that are caused due to inefficient portfolio management, strategic alignment, performance measurement, resource management, risk management, value delivery and stakeholder management aspects were taken from the Section 4.6.1 and Section 4.6.2. Moreover, for a better understanding on where the GSCC is with regards of the studied ITG and PG aspects, Table12 created with the input of the ICT manager was provided.

3. Proposed Solution – in this section the researcher and the ICT manager discussed the existent ITG and PG frameworks and focused on the COBIT 5. The information on why COBIT 5 was chosen as a framework to improve the project governance in the GSCC was taken from the Section 5.1.1. A BAI01 process was set as the prioritized process for implementation. A brief background was provided on how the BAI01 process was chosen as a process enabler. To give the leadership a better view of where the GSCC ICT team is now with regards to programmes and projects management, the BAI01 capability level assessment was also provided.

Based on the provided information and reasonable arguments with supporting evidence, the GSCC leadership approved the adoption of COBIT 5 framework and specifically implementation of the BAI01 process.

5.1.3. Phase 3: BAI01 Process Implementation Planning

The next phase of the identified roadmap was the BAI01 process implementation planning, the purpose of which is to improve programme and project management within the GSCC. The researcher together with the ICT team have scheduled a conference call to discuss the BAI01 process. The goal of this call was to give the team a good understanding of what are the activities required by the chosen process and plan how the process should be adapted to the GSCC environment. However, one conference call was not enough, as it lasted just for 2 hours and the researcher was only able to introduce the BAI01 process to the team. To plan the adoption process, another conference call was scheduled for the next day for five hours long. During the second conference call, the BAI01 process was studied thoroughly, and necessary actions were taken to tailor the framework to the GSCC culture. Firstly, the ICT manager was assigned as a process author, responsible for monitoring and delivery of process activities, while the PMs and TPMs were assigned as Programme and Project Management subject matter experts (SMEs). The team has covered all the activities and the decision was made that all the activities that are listed in BAI01 management practices are totally relevant to the GSCC project management practices and all of them should be adopted by the team.

Then, the whole GSCC team was set as BAI01 process implementation team. At this stage the RACI matrix was modified to reflect the GSCC team roles. Moreover, other business units and departments, which share the same business activities with the GSCC, as well as InfoSec Department, Finance Department, Procurement Department and Policy Compliance Department were included in the RACI chart. The table below presents how the roles were assigned for each BAI01 management practice:

BAI01 Management Practice	R Responsible	A Accountable	C Consulted	I Informed
BAI01.01	<ul style="list-style-type: none"> • ICT manager • PMs • TPMs 	<ul style="list-style-type: none"> • GSCC Senior Manager 	<ul style="list-style-type: none"> • Senior Crisis Managers • Senior Site Leads • SW Dev. Senior Manager 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager
BAI01.02	<ul style="list-style-type: none"> • PMs • ICT Manager • SW Dev. Senior Manager 	<ul style="list-style-type: none"> • Senior Site Leads 	<ul style="list-style-type: none"> • Managers from other business units , which share business activities with the GSCC • Senior Crisis Managers • Finance Department • InfoSec Department • Policy Compliance Department 	<ul style="list-style-type: none"> • GSCC Senior Manager • Managers of the GSCC Senior Manager
BAI01.03	<ul style="list-style-type: none"> • ICT Manager • PMs • TPMs 	<ul style="list-style-type: none"> • GSCC Senior Manager 	<ul style="list-style-type: none"> • Senior Crisis Managers • Senior Site Leads • Policy Compliance Department • Finance Department • Procurement Department • HR department • InfoSec Department 	<ul style="list-style-type: none"> • Managers from other business units, which share business activities with the GSCC
BAI01.04	<ul style="list-style-type: none"> • ICT Manager • PMs • SW Dev. Senior Manager 	<ul style="list-style-type: none"> • Senior Site Leads 	<ul style="list-style-type: none"> • Senior Crisis Managers • GSCC Senior 	<ul style="list-style-type: none"> • Manager • Managers of the GSCC Senior Manager
BAI01.05	<ul style="list-style-type: none"> • ICT Manager • PMs • SW Development Senior Manager 	<ul style="list-style-type: none"> • Senior Site Leads 	<ul style="list-style-type: none"> • GSCC Senior Manager • Senior Crisis Managers • InfoSec Department • Finance Department • Policy Compliance Department 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager
BAI01.06	<ul style="list-style-type: none"> • ICT Manager • PMs • TPMs • SW Development Senior Manager 	<ul style="list-style-type: none"> • Senior Site Leads 	<ul style="list-style-type: none"> • Senior Crisis Managers • GSCC Senior Manager 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager

	<ul style="list-style-type: none"> SDEs 			
BAI01.07	<ul style="list-style-type: none"> PMs TPMs 	<ul style="list-style-type: none"> ICT Manager 	<ul style="list-style-type: none"> GSCC Senior Manager Senior Crisis Managers SW Development Senior Manager Senior Site Leads Finance Department InfoSec Department Policy Compliance Department Procurement Department 	<ul style="list-style-type: none"> Managers of the GSCC Senior Manager Managers from other business units, which share business activities with the GSCC
BAI01.08	<ul style="list-style-type: none"> PMs TPMs 	<ul style="list-style-type: none"> ICT Manager 	<ul style="list-style-type: none"> Senior Crisis Managers GSCC Senior Manager Senior Site Leads SW Development Senior Manager SDEs 	<ul style="list-style-type: none"> Managers of the GSCC Senior Manager Managers from other business units, which share business activities with the GSCC
BAI01.09	<ul style="list-style-type: none"> PMs TPMs SW Development Senior Manager SDEs Senior Site Lead Senior Crisis Managers BCAs 	<ul style="list-style-type: none"> ICT Manager 	<ul style="list-style-type: none"> Policy Compliance Department InfoSec Department 	<ul style="list-style-type: none"> GSCC Senior Manager
BAI01.10	<ul style="list-style-type: none"> SW Development Senior Manager PMs TPMs Senior Site Lead 	<ul style="list-style-type: none"> ICT Manager 	<ul style="list-style-type: none"> InfoSec Department Policy Compliance Department Finance Department PMs from other business units, which share business activities with the GSCC 	<ul style="list-style-type: none"> GSCC Senior Manager Senior Crisis Managers Senior Site Leads Managers of the GSCC Senior Manager

BAI01.11	<ul style="list-style-type: none"> • SW Development Senior Manager • PMs • TPMs • SDEs 	<ul style="list-style-type: none"> • ICT Manager 	<ul style="list-style-type: none"> • GSCC Senior Manager • Senior Crisis Managers • Senior Site Leads 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager • Managers from other business units, which share business activities with the GSCC
BAI01.12	<ul style="list-style-type: none"> • SW Development Senior Manager • Senior Site Leads • Senior Crisis Managers • Procurement Department • Finance Department • HR Department • Learn and Development Department 	<ul style="list-style-type: none"> • ICT Manager 	<ul style="list-style-type: none"> • Info Sec Department • Policy Compliance Department • GSCC Senior Manager 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager
BAI01.13	<ul style="list-style-type: none"> • PMs • TPMs 	<ul style="list-style-type: none"> • ICT Manager 	<ul style="list-style-type: none"> • InfoSec Department • Policy Compliance Department • GSCC Senior Manager • Senior Crisis Managers • Senior Site Leads • SW Development Senior Manager 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager • Managers from other business units, which share business activities with the GSCC
BAI01.14	<ul style="list-style-type: none"> • ICT Manager • PMs • TPMs • Senior Crisis Managers 	<ul style="list-style-type: none"> • Senior Site Leads • 	<ul style="list-style-type: none"> • GSCC Senior Manager • Senior Site Leads • SW Dev. Senior Manager 	<ul style="list-style-type: none"> • Managers of the GSCC Senior Manager • Finance Department • InfoSec Department • Policy Compliance Department

Table 16: BAI01 RACI Chart Tailored to the GSCC Environment (Source: The GSCC ICT Manager and the Author)

When the RACI matrix was modified, the ICT team started brainstorming on each practice delivery schedule planning. The team realized that the BAI01 process has quite many management practices and the ICT manager decided to prioritize practices. The prioritization was based on the researcher's input. The findings and analysis of the research questions structured according to ITG and PG main aspects were taken into consideration. Moreover, the ICT team decided to start addressing the GSCC project governance issues with small steps. Rather than starting with the programme management, the team chose to focus on project management practices first. Therefore, the team has divided the project in two phases:

- Phase 1: Implementation of prioritized BAI01 practices
- Phase 2: Implementation of the BAI01 practices that were not included in the prioritized phase

After the prioritization was made, the following COBIT 5 BAI01 process management practices have been included in Phase 1, intended to address the ITG/PG aspects:

Management Practice	Output	ITG/PG Aspect
BAI01.03 – Manage Stakeholder Engagement	<ul style="list-style-type: none"> • Stakeholder engagement plan • Results of stakeholder engagement effectiveness assessments 	<ul style="list-style-type: none"> • Stakeholder Management
BAI01.08 – Plan Projects	<ul style="list-style-type: none"> • Project Plans • Project baseline • Project reports and communications 	<ul style="list-style-type: none"> • Portfolio Management • Strategic Alignment
BAI01.09 - Manage programme and project quality	<ul style="list-style-type: none"> • Quality management plan • Requirements for independent verification of deliverables 	<ul style="list-style-type: none"> • Value Delivery • Performance Measurement
BAI01.10 Manage programme and project risk.	<ul style="list-style-type: none"> • Project risk management plan • Project risk assessment results • Project risk register 	<ul style="list-style-type: none"> • Risk Management
BAI01.11 Monitor and control projects.	<ul style="list-style-type: none"> • Project performance criteria • Project progress reports • Agreed-on changes to project 	<ul style="list-style-type: none"> • Performance Measurement
BAI01.12 Manage project resources and work packages.	<ul style="list-style-type: none"> • Project resource requirements • Project roles and responsibilities • Gaps in project planning 	<ul style="list-style-type: none"> • Resource Management

BAI01.13 Close a project or iteration	<ul style="list-style-type: none"> • Post-implementation review results • Project lessons learned • Stakeholder project acceptance confirmations 	<ul style="list-style-type: none"> • Strategic Alignment • Value Delivery
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Table 17: Prioritized BAI01 Management Processes

At this stage the team was not able to set the timeframe for both phases due to one huge limitation – there was no proper experience within the team to obtain the outputs for each of the prioritized practices. For better guidance on the activities, COBIT 5 also provides related standards, specific to each of its processes. For the BAI01, COBIT 5 advises obtaining PMBOK and PRINCE2 best practices (ISACA, 2012f). The GSCC ICT team decided to request PRINCE2 training for the team.

The last step of the BAI01 planning phase was creation of the process implementation document to get the approval from the leadership and the GSCC team. The ICT manager has created the BAI01 process adoption document (due to the anonymity purpose, this internal document was not provided to the researcher). The document was based on its original description in COBIT 5 with modifications that were tailored to the GSCC environment. It was structured in the following fashion:

- BAI Process Description and Purpose (based on the COBIT 5 original description)
- Process Goals and Metrics (based on the COBIT 5 original description)
- Process Author, SMEs, and Implementation Team (identified in Section 5.1.3)
- BAI01 Process with adjusted RACI matrix (identified in Section 5.1.3)
- Implementation Phases (identified in Section 5.1.3)
- Identified Limitation (necessity for PRINCE2 training)

Later, the ICT manager has set up a meeting with the GSCC leadership and the ICT team to discuss the process document, obtain approval, and set the timeframe for the implementation.

5.1.4. Phase 4: Implementation

The last phase of the COBIT5 BAI01 Manage Programmes and Projects adoption was its implementation. To begin the actual implementation phase, BAI process document was sent to the GSCC leadership and a meeting was scheduled to review if the implementation planning needed any changes. The ICT manager has provided the researcher with the information on the BAI process planning meeting outcomes:

- BAI01 Process SME and Implementation Team – **Approved**

- Adjusted RACI Matrix – **Approved**
- BAI01 Process Two Implementation Phases – **Approved**
- Request for the PRINCE2 Training – **Approved**

After the ICT team received an approval from the GSCC leadership, they started working on scheduling. Unfortunately, due to time limitation of the research completion and thesis final submission date, the researcher was not able to obtain the exact dates for each stage of the BAI 01 process implementation within the GSCC business unit. However, during the last call, the ICT manager has provided approximate dates for the following BAI01 process adoption stages:

Milestone	Start Date	End Date
PRINCE2 Training		29 th June 2018
Phase 1: BAI01 Implementation	2 nd July 2018	14 th December 2018
Phase 1 Review:	21 st December 2018	
Phase 2: BAI01 Implementation	7 th January 2019	28 th June 2019
Phase 1 Review:	5 th July 2019	

Table 18: Approximate Dates for the BAI01 Process Adoption in the GSCC

The ICT manager explained to the researcher that before the end of June 2018, the ICT team has several projects to deliver and there will not be much space for the team to do PRINCE2 training before the end of June. Moreover, the process of professional training funding from the Finance and Learning and Development Departments will also take some time. Therefore, he has assumed that an approximate training completion date for the team would be the end of June. Based on this assumption, the ICT manager has set approximately 1 year for the full implementation of the BAI01 process, allocating 6 months for the implementation of each phase.

5.2. Limitations

Due to the fact that the research was conducted in a single department of only one organization, the major limitation of the current case study is disability to provide a general conclusion on what can be done to improve the project governance. This thesis focused on the ITG and PG aspects and the level of their adoption only in the selected sample business unit. Therefore, the recommendation to implement COBIT 5 BAI01 process was suitable only based on the research results for the given case study. However, the researcher believes that the selected approach and the selected framework can be applied in any enterprise as the flexibility of COBIT 5 gives the opportunity to choose and tailor its processes based on the business needs.

Another limitation of this thesis was time constraints. This influenced the BAI01 process implementation approach. The researcher wanted to apply *COBIT 5 Implementation* lifecycle phases, however the deadline of thesis submission, has limited the researcher and pushed to choose a less rigorous process implementation method. The time limit also affected the possibility to obtain the exact project plan for the BAI01 implementation. Although, the ICT manager of the GSCC has provided the approximate dates of COBIT 5 process adoption. Moreover, the researcher was not able to assess a post-implementation phase as the adoption of the BAI01 process was scheduled for approximately one financial year. A period of at least another six months would be necessary to be able to evaluate the level of the examined PG and ITG factors as well as the capability level of the BAI01 process.

The mentioned above limitations do not point out insignificance of the research or that the findings and chosen approach were not valid. These limitations are provided to identify their existence.

5.3. Future Development

There is a huge potential to conduct further research to identify other major factors that influence the level of the PG within the enterprise. It would be beneficial to focus the further research on the four categories for the implementation of effective PG, identified in the Section 2.3. Examination and adoption of governance, competency, processes and culture as the project management fundamentals (David L. Pells et al., 2012) together with implementation of the key aspects of successful ITG and PG will provide a holistic approach to maintain the effective PG.

The researcher believes there are also considerable opportunities for the GSCC to continue the development of the proper environment for the PG. Firstly, further research can be conducted to identify if the BAI01 process adoption had a positive effect on the overall level of PG in the GSCC. Moreover, assessment of the capability level of the chosen and implemented process will also give a good understanding if the GSCC moves in the right direction. Secondly, the case study has shown many gaps between the actual and the desired level of the ITG and PG aspects within the GSCC. The researcher advises the sample department to continue the implementation of the other COBIT5 processes. Through the use of COBIT 5, the GSCC will be able to apply the same process implementation approach as the researcher has used for the current case study to improve its performance and productivity.

5.4. Conclusion

To meet the thesis main goal set up in the Introduction chapter, the researcher has established objectives both for theoretical and practical parts of the research. By reading Chapter 2, the reader should be able to identify the fulfilled goals determined for the theoretical part. Literature review was performed to provide an in-depth understanding of different types of governance and management in project management activities. The theoretical background highlights that in order to ensure the IT alignment with business strategy, a proper ITG culture should be adopted. The following five key areas of the ITG should be in place: strategy alignment, value delivery, risk management, resource management and performance management. On the other hand, doing the right projects, which means the alignment of the IT projects with enterprise objectives, is primarily the responsibility of the PG. To maintain an effective PG culture, enterprises should follow certain PG components: strategic alignment, risk management, portfolio management, organization, stakeholder management, performance evaluation and business transformation. Later, the researcher described various ITG and PG standards and frameworks to help the reader to avoid the confusion to understand the focus and purpose of each. PRINCE2, PMBOK, ITIL and COBIT 5 were described to provide the benefits and challenges of their adoption within the enterprise.

The work performed in Chapter 3 provides the research methodology design, which was later used to meet the objectives for the practical part of the thesis. To answer the main research question of the thesis “*What can be done to improve the Project Governance?*” within sample department, the researcher used the key aspects of successful ITG and PG culture identified in the theoretical part. To obtain the information on the current project management activities within the chosen organizational unit, she created the questionnaire and used a holistic approach by combining both ITG and PG main factors. The level of adoption of stakeholder management, portfolio management, strategic alignment, performance measurement, resource management, risk management, and value delivery concepts has been examined through the interviews with the employees. The analysis of the findings has proved the mentioned above factors are inadequately adopted within the GSCC ICT department. The assessed aspects play important role in the success of ICT project management and in order to gain effective PG, the researcher together with the sample department’s ICT manager have concluded that the organizational unit should heal the main ITG and PG factors as the priority.

Within the scope of this thesis, the researcher helped the GSCC to select the best suitable approach to improve the PG with the focus on the key aspects of successful ITG and PG. COBIT5 was chosen as an umbrella framework for IT governance and IT-related risk management in the GSCC. To address the existing project management issues, the BAI01 Manage Programmes and Projects process was decided to be implemented. The capability level of the selected process was assessed in order to show the leadership the space for improvement. The flexibility of COBIT 5 framework allowed tailoring the BAI01

process to suit the GSCC environment best with its currently available roles and activities. The GSCC leadership has agreed with the importance of the IT processes alignment with business goals and provided the required support for the BAI01 implementation. The adoption of the chosen process, intended to improve the PG culture, has been divided into two phases and will allow the GSCC team to improve the project management practices directly related to the examined ITG and PG aspects at the first place and then to address the programme management practices.

Although, due to time limitations and the deadline of thesis submission, the researcher was not able to monitor the actual process implementation phase and the post implementation results, she helped the GSCC to make a huge step forward to improvement of its PG and ITG processes by adopting COBIT5 framework. The case study that the researcher has conducted gave the GSCC a better understanding of the business goals and showed the importance of each of the ITG and PG aspects on the overall ICT projects delivery success.

The researcher has accomplished her goal by recognizing the factors that influence the success of the GSCC PG and directing the department on how to improve the identified aspects to better manage their ICT projects. In addition to this, the researcher has provided COBIT 5 tools to help the GSCC to continue improvement of the management of IT-related processes focusing on their strategic alignment with the business as well as value delivery by risk and resource optimization.

ABBREVIATIONS

ACM	Assistant Crisis Manager
APM	Association of Project Management
APO	Align, Plan and Organize
BAI	Build, Acquire and Implement
BCA	Business Continuity Analyst
CAQDAS	Computer Aided Qualitative Data Analysis Software
CCTA	Central Computer and Telecommunications Agency
CEO	Chief Executive Officer
CIMA	Chartered Institute of Management Accountants
CIO	Chief Information Officer
CM	Crisis Manager
CN-ROC	China Regional Operational Center
COBIT	Control OBjectives of Information and related Technologies
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CSI	Continual Service Improvement
DSS	Deliver, Service and Support
EDM	Evaluate, Direct and Monitor
EMEA	Europe, Middle East, and Africa
EPG	Enterprise Project Governance
EU-ROC	European Regional Center
GDPR	General Data Protection Regulation
GSCC	Global Security and Communications Centers
GTAG	Global Technology Audit Guide
HOTO	Handover/Takeover
ICT	Information and Communication Technology
IFAC	International Federation of Accountants
InfoSec	Information Security
IODSA	Institute of Directors Southern Africa
IPPF	International Professional Practices Framework
IS	Information Systems
ISACA	Information Systems Audit and Control Association
ISO 20000	International Organization for Standardization 20000
ISO 21500:2012	International Organization for Standardization 21500:2012
ISO 27002	International Organization for Standardization 27002
ISO 38500	International Organization for Standardization 38500
IT	Information Technology

ITG	IT governance
ITGI	IT Governance Institute
ITIL	Information Technology Infrastructure Library
ITSM	IT Service Management
LSSI	Lean Six Sigma Institute
MEA	Monitor, Evaluate and Assess
NA	North America
NA-ROC	North American Regional Operational Center
OECD	Organization for Economic Cooperation and Development
OGC	Office of Government Commerce
P3 Governance	Projects, Programs and Portfolios Governance
PAM	Process Assessment Model
PG	Project Governance
PM	Program Manager
PMI	Project Management Institute
PMBOK	Project Management Body of Knowledge
PMO	Project Management Office
PO	Product Owner
PRINCE2	PRojects IN Controlled Environments
QA	Quality Assurance
QM	Quality Management
QMS	Quality Management Systems
RACI	Responsible, Accountable, Consulted, Informed
ROC	Regional Operations Center
ROI	Return On Investment
SAME	Standard Architectural Management Environment
SD	Software Development
SDE	Software Development Engineer
SME	Subject Matter Expert
SOX	Sarbanes-Oxley Act
TOGAF	The Open Group Architecture Framework
TPM	Technical Program Manager
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

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APPENDICES

Appendix A – Invitation for Participation in Research Study



University of Economics, Prague
Faculty of Informatics and Statistics
nám. W. Churchilla 4, 130 67 Praha
Tel.: +420 224 095 441, e-mail: Studijni.F4@vse.cz

Invitation for Participation in Research Study

Dear Team,

I am currently conducting a research study for my Master Thesis in Information Systems Management studies. I would appreciate your participation in this research. The main goal of this study is to identify critical factors that affect the success of Project Governance and its implementation. This research will lead to exploration of valuable insights for the technical projects implementation as well as will be beneficial for overall project management process within the department.

- Research Purpose:
 - To examine individual insights on the project governance topic, its effectiveness and its appropriateness within the department
- Your rights:
 - Your participation is voluntary and your personal information will be disguised for the anonymity purpose. Your anonymity will be protected at all times.
 - The information you provide will never be used for other purposes apart from the given scope of the research
 - If you decide to withdraw from the research, you may do so at any time. In case your withdrawal, all the data provided by you will be destroyed.
 - In case you do not want to answer any question, you may skip it.
- Why are you interviewed:
 - Each of the invited respondents was chosen because of the role and position within the department, meaning your responsibilities are closely related to the Project Governance
- How the research will be conducted:
 - Interview Methods:
 - In case of face-to-face interview, the notes will be taken of all your responses on the asked questions. With your permission, digital recorder will be utilized to record the interview.
 - In case of phone interview, the notes of all the interviews will be taken. . With your permission, digital recorder will be utilized to record the interview.
 - In case of email exchange, the answers will be recorded in a Word file. The email will be deleted as soon as the answers will be analyzed.
 - Upon request, the notes taken during interview may be sent to you.
 - Location and Timing:
 - You will be interviewed for no longer than 45 minutes.
 - In case of face-to-face interview, the time and location will be agreed with you. Upon your request, the interview will be paused at any time.
 - In case of phone interview, the time will be agreed with you. Upon your request, the interview will be paused at any time.

- In case of email questionnaire, you will have up to 2 weeks to answer the questions and send your answers via email.

In case you agree with all the terms and conditions and you are willing to participate in this research, please reply to my e-mail. Also please find the attached Participation Agreement Form and please send it signed back to me via email in case you agree to participate in the research. Upon your acceptance of the interviewing invitation, I will schedule the most suitable time and location for the interview.

The final results of the research will be publicly available at the library of [the University of Economics in Prague, Czech Republic](#). Upon your request, a digital version of the final thesis will be sent to you via e-mail.

Should you have any concerns regarding the research project, please reach out to me via e-mail.

Thank you for participation,
Kind Regards,
Violeta Aslanova
(aslanovavioleta@gmail.com)

Date: February 3, 2018.

Appendix B – Participation Agreement Form



University of Economics, Prague
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Participation Agreement Form

Project Title: *Project Governance*
Researcher: *Violeta Aslanova (aslanovavioleta@gmail.com)*
Project Supervisor: *doc. Ing. Vlasta Svatá, CSc (vlasta.svata@vse.cz)*

- ☐ I have read and understood the information about the research project
- ☐ I understand that notes will be taken during the interview as well as digital recorder will be utilized to record the interview
- ☐ I understand that I may withdraw myself from the research at any time. If I withdraw, I understand that all relevant information including notes and digital records will be destroyed
- ☐ I agree to take a part in this research

Participant's Name _____

Participant's Signature _____

Participant's Contact e-mail _____

Date: _____

Appendix C – Questionnaire



University of Economics, Prague
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nám. W. Churchilla 4, 130 67 Praha
Tel.: +420 224 095 441, e-mail: Studijni.F4@vse.cz

Project Title: *Project Governance*
Researcher: *Violeta Aslanova (aslanovavioleta@gmail.com)*
Project Supervisor: *doc. Ing. Vlasta Svata, CSc (vlasta.svata@vse.cz)*

Questionnaire

Main Research Topic Question: “What can be done to improve the Project Governance?”

1. Portfolio Management

- Do you have a project inventory that includes all ongoing, proposed and finished programmes/projects?
- How do you initiate a programme? Do you usually define a programme plan? What do you include in your programme planning?
- How do you initiate projects within your programme or portfolio? Are stakeholders engaged in project initiation and approval stage?

2. Strategic alignment

- How do you select the strategy to align the ICT project with business case?
- What is done to make sure that projects are aligned with business requests?
- How much stakeholders are satisfied with the scope of the planned ICT project and with the delivered project? Are all projects fully aligned with their business needs?

3. Performance measurement

- Is project performance criteria predefined for each milestone? How do you measure the performance?
- What do you do if you have any deviations in performance indicators?
- What are the main issues that prevent projects to meet performance?

4. Resource management

- How human resources within the project are planned, allocated and measured?
- Can ICT team meet business needs of the department with available resources?
- How project-related proposals and documentations are managed?

5. Risk management

- Do you evaluate ICT/IT risk factors in advance of pending strategic enterprise decisions and ensure that decisions are being made considering those risks? Do you have risk register?
- How do you measure risks throughout the project lifecycle (metrics, against targets)? Do you know if any of your business processes supported by IT are under the risk?
- What type of risks you usually face? Do you assign people to mitigate those risks?

6. Value delivery

- Do you define any quality management (QM) plans for projects? Do you define quality management standards (QMS)?
- Do you have assigned roles for project quality assurance?
- Do you calculate ROI? What are the challenges to ensure value delivery in the GSCC?

Appendix D – BAI01 Self-Assessment

Self-assessmentTemplate (Appendix D of the Self-assessment Guide)

Process Name	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
BAI01		PA 1.1	PA 2.1 PA 2.2	PA 3.1 PA 3.2	PA 4.1 PA 4.2	PA 5.1 PA 5.2
Rating by Criteria		L	P	P		
Capability Level Achieved		1				

N- 0%-15%

P- 15%-50%

L- 50%-85%

F- 85%-100%

N – Not Achieved
P – Partially Achieved
L – Largely Achieved
F- Fully Achieved

BAI01	Manage Programmes and Projects							
	Purpose	Realise business benefits and reduce the risk of unexpected delays, costs and value erosion by improving communications to and involvement of business and end users, ensuring the value and quality of project deliverables and maximising their contribution to the investment and services portfolio.						
	Assess whether the following outcomes are achieved.	Criteria	Criteria Are Met Y/N	Comment	Not achieved (0-15%)	Partially Achieved (15% - 50%)	Largely Achieved (50% - 85%)	Fully Achieved (85-100%)
Level 0 Incomplete	The process is not implemented, or fails to achieve its process purpose.	At this level, there is little or no evidence of any achievement of the process purpose.						
Level 1 Performed	PA 1.1 The implemented process achieves its process purpose.	The following process outcomes are being achieved:	Overall rating for the process					
		BAI01-O1 Relevant stakeholders are engaged in the programmes and projects.	Y	When a project starts, the ICT team makes sure to involve relevant stakeholders in project decision making. However, the team lacks the commitment of stakeholders			L	
		BAI01-O2 The scope and outcomes of programmes and projects are viable and aligned with objectives.	Y	ICT manager explained when a project is started, department's mission and business alignment are considered. However, sometimes stakeholders fail to prioritize critical to business projects			L	

		BAI01-03 Programme and project plans are likely to achieve the expected outcomes.	Y	ICT team mentioned during the interview that they define realistic goals, expected benefits, scope and required resources to be able to achieve them.				F
		BAI01-04 The programme and project activities are executed according to the plans.	Y	ICT team said that they strictly follow the project planning.				F
		BAI01-05 There are sufficient programme and project resources to perform activities according to the plans.	Y	Although the GSCC lacks resources and adequate management of resources, leadership maximally allocates requested resources before the project starts			L	
		BAI01-06 The programme and project expected benefits are achieved and accepted.	Y	Interviewee 9 explained that usually delivered projects meets expectations. However, the Interviewee 4 and 6 mentioned that a couple of projects failed to meet deadlines			L	
Level 2 Managed	PA 2.1 Performance Management - A measure of the extent to which the performance of the process is managed.	As a result of full achievement of this attribute: a) Objectives for the performance of the process are identified. b) Performance of the process is planned and monitored. c) Performance of the process is adjusted to meet plans. d) Responsibilities and authorities for performing the process are defined, assigned and communicated. e) Resources and information necessary for performing the process are identified, made available, allocated and used. f) Interfaces between the involved parties are managed to ensure both effective communication and also clear assignment of responsibility.	N	Although project planning is done within the GSCC, none of the milestones have identified performance metrics. Moreover, the GSCC has no performance measurement process, although it works on its adoption. During project planning responsibilities are assigned and communicated. Project-related human resources are made available.	P			
			N					
			N					
			Y					
			Y					
			Y					
	PA 2.2 Work Product Management - A measure of the extent to which the work products produced by the process are appropriately managed. The work products (or outputs from the process) are defined and controlled.	As a result of full achievement of this attribute: a) Requirements for the work products of the process are defined. b) Requirements for documentation and control of the work products are defined. c) Work products are appropriately identified, documented, and controlled. d) Work products are reviewed in accordance with planned arrangements and adjusted as necessary to meet requirements.	Y	Although when the projects starts the requirements are identified, outputs of each milestone are not documented. The team works on a single-point of resource documentation, however, they have no consistent reporting on project milestones progress. There is no practice of process output review since there are no predefined	P			
			N					
			N					
			N					

Level 3 Established	PA 3.1 Process Definition - A measure of the extent to which a standard process is maintained to support the deployment of the defined process.	<p>As a result of full achievement of this attribute:</p> <ul style="list-style-type: none"> a) A standard process, including appropriate tailoring guidelines, is defined that b) The sequence and interaction of the standard process with other processes is determined. c) Required competencies and roles for performing a process are identified as part of the standard process. d) Required infrastructure and work environment for performing a process are identified as part of the standard process. e) Suitable methods for monitoring the effectiveness and suitability of the process are determined. 						
	PA 3.2 Process Deployment - A measure of the extent to which the standard process is effectively deployed as a defined process to achieve its process outcomes.	<p>As a result of full achievement of this attribute:</p> <ul style="list-style-type: none"> a) A defined process is deployed based upon an appropriately selected and/or tailored standard process. b) Required roles, responsibilities and authorities for performing the defined process are assigned and communicated. c) Personnel performing the defined process are competent on the basis of appropriate education, training, and experience. d) Required resources and information necessary for performing the defined process are made available, allocated and used. e) Required infrastructure and work environment for performing the defined process are made available, managed and maintained. f) Appropriate data are collected and analysed as a basis for understanding the behaviour of, and to demonstrate the suitability and effectiveness of the process, and to evaluate where continuous improvement of the process can be made. 						

Level 4 Predictable	PA 4.1 Process Measurement - A measure of the extent to which measurement results are used to ensure that performance of the process supports the achievement of relevant process performance objectives in support of defined business goals.	As a result of full achievement of a) Process information needs in support of relevant defined business goals are established. b) Process measurement objectives are derived from process information needs. c) Quantitative objectives for process performance in support of relevant business goals are established. d) Measures and frequency of measurement are identified and defined in line with process measurement objectives and quantitative objectives for process performance. e) Results of measurement are collected, analysed and reported in order to monitor the extent to which the quantitative objectives for process performance are met. f) Measurement results are used to characterise process performance.						
Level 5 Optimizing	PA 4.2 Process Control - A measure of the extent to which the process is quantitatively managed to produce a process that is stable, capable and predictable within defined limits.	As a result of full achievement of a) Analysis and control techniques are determined and applied where applicable. b) Control limits of variation are established for normal process performance. c) Measurement data are analysed for special causes of variation. d) Corrective actions are taken e) Control limits are re-established (as necessary) following corrective action.						
Level 5 Optimizing	PA 5.1 Process innovation - A measure of the extent to which changes to the process are identified from analysis of common causes of variation in performance, and from investigations of innovative approaches to the definition and deployment of the process.	As a result of full achievement of this attribute: a) Process improvement objectives for the process are defined that support the relevant business goals. b) Appropriate data are analysed to identify common causes of variations in process performance. c) Appropriate data are analysed to identify opportunities for best practice and innovation. d) Improvement opportunities derived from new technologies and process concepts are identified. e) An implementation strategy is established to achieve the process improvement objectives.						
	PA 5.2 Process optimisation - A measure of the extent to which changes to the definition, management and performance of the process result in effective impact that achieves the relevant process improvement objectives.	As a result of full achievement of this attribute: a) Impact of all proposed changes is assessed against the objectives of the defined process and standard process. b) Implementation of all agreed changes is managed to ensure that any disruption to the process performance is understood and acted upon. c) Based on actual performance, effectiveness of process change is evaluated against the defined product requirements and process objectives to determine whether results are due to common or special causes.						

Transcripts of interviews omitted due to privacy legislation.