TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

IDA LEVÓN
INNOVATION GOVERNANCE IN PROJECT-BASED
ORGANIZATIONS

Master's thesis

ABSTRACT

Innovations have become an important way to gain competitive edge and therefore have an increasing effect on companies' strategies. Innovation projects need structures, project management tools and decision-making models, i.e. project governance, to ensure the value creation of projects, programs and portfolios. The subject needs further addressing so that best practices in governing innovation in project-based organizations can be created. This research aims to understand what kind of governance mechanisms two different project-based organizations use and how the governance mechanisms could be improved to improve also the organization's innovation capabilities.

In this research, a qualitative multiple case study was applied in two Finnish project-based organizations. The data was collected by semi-structured interviews. The interviewees represented different roles related to new product development and innovation functions in the case companies so that a comprehensive picture of the current governance mechanisms used could be obtained. The data from case companies was analyzed first case-specifically, and a cross-case comparison was made between the companies. The main challenges in innovation governance were highlighted.

The study reveals the importance of project governance also in innovation context. Well-defined governance structures support the decision-making and management of innovation projects, programs and portfolios. Well-defined roles and responsibilities also help in steering the projects. The base of all innovation activities in an organization is an innovation strategy that is communicated all the way to project level so that the project goals are aligned with the strategy. That way everyone in the organization can commit to innovation initiatives.

The results of this study can be used in project-based organizations to support the constructing or redefining of innovation project governance in an organization. A checklist enables detecting the relevant topics related to innovation project governance. The results offer several topics for future research. Innovation governance in different sized companies requires further research as well as the role of different actors and decision-makers affecting the governance and the efficiency of innovation projects.

TIIVISTELMÄ

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Innovaatioista on tullut tärkeä tapa luoda kilpailuetua ja sen myötä niillä on yhä tärkeämpi vaikutus yritysten strategioihin. Innovaatioprojektit tarvitsevat rakenteita, projektinhallinnan työkaluja ja päätöksentekomalleja eli projektinhallintaa varmistaakseen arvon luonnin projekteissa, ohjelmissa ja portfolioissa. Aihe vaatii lisätutkimusta, jotta voidaan luoda innovaatioiden hallinnan parhaita käytäntöjä projekteihin keskittyneissä organisaatioissa. Tämä tutkimus pyrkii lisäämään ymmärrystä siitä, millaisia innovaatioiden hallinnan mekanismeja kahdessa projekteihin keskittyneessä organisaatiossa hyödynnetään ja miten hallinnan mekanismeja voitaisiin parantaa, jotta myös organisaation innovaatiovalmiuksia voitaisiin parantaa.

Tutkimus toteutettiin laadullisena monitapaustutkimuksena kahdessa suomalaisessa projekteihin keskittyneessä organisaatiossa. Tutkimusmateriaali kerättiin teemahaastattelujen avulla. Haastateltavat edustivat erilaisia rooleja liittyen tuotekehitykseen ja yritysten innovaatiofunktioihin, jotta voitiin muodostaa kattava kuva yritysten tämänhetkisistä hallintamekanismeista. Kohdeyrityksiä tutkittiin yksittäin ja lopuksi tehtiin ristiin vertailu yritysten välillä. Innovaatioiden hallinnan ydinhaasteita koottiin yhteen.

Tutkimus paljastaa projektinhallinnan tärkeyden myös innovaatiokontekstissa. Hyvin määritellyt hallinnan rakenteet tukevat päätöksentekoa ja innovaatioprojektien, -ohjelmien ja -portfolioiden johtamista. Hyvin määritellyt roolit ja vastuut auttavat myös projektien ohjaamista. Kaiken organisaation innovaatiotoiminnan pohjana voidaan pitää innovaatiostrategiaa, joka on kommunikoitu projektitasolle asti siten, että projektin tavoitteet ovat linjassa strategian kanssa. Siten kaikki organisaatiossa voivat sitoutua innovaatioaloitteisiin ja -projekteihin.

Tämän tutkimuksen tuloksia voidaan hyödyntää projekteihin keskittyneissä organisaatioissa tukemaan innovaatioprojektien hallinnan muodostamista ja uudelleenmäärittelyä. Tarkistuslista mahdollistaa tärkeiden, innovaatioprojektien hallintaan liittyvien aihealueiden havaitsemisen. Tuloksista nousi useita aiheita tulevalle tutkimukselle. Innovaatioiden hallintatavat erikokoisissa yrityksissä sekä eri toimijoiden ja päätöksentekijöiden roolit, jotka vaikuttavat hallintatapoihin ja innovaatioprojektien tehokkuuteen vaativat lisätutkimusta.

PREFACE

The idea for this thesis became from professor Miia Martinsuo and the subject developed during the process to this final form. I have a great interest towards innovations and project management which is probably why I have chosen to work in a project-based firm. That is also why this thesis subject was very interesting to me.

Writing this thesis has been a long and somewhat challenging process. This is the final step as an Industrial Engineering and Management student in Tampere University of Technology. The past seven years have been the best time of my life. I have met the most amazing people during my studies and made friends for life. There is no better time for graduating since this is an end of an era also for TUT that will become part of Tampere University in 2019.

During this process I have learned a lot about innovations and project governance but also about myself. I want to thank professor Miia Martinsuo for guiding this process and encouraging me when I was stuck with my thoughts. I want to thank the CROPS research group for peer support during the springtime. I also want to thank my family and friends for supporting me in my studies. Especially I want to thank Matias Mikkola, who has supported me through this whole process, helped in proofreading and gave his opinions when I was uncertain about my choices.

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Ida Levón

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1. INTRODUCTION

1.1 Background

According to Winter et al. (2006), the management of projects, programs and portfolios is the dominant model in many organizations for achieving strategic goals, business transformation, continuous improvement and new product development. Innovations have become more and more important in all organizations when technological evolution accelerates, and organizations need to react to continuous changes in their operating environment. Innovations should be supported in all levels of the organization. Innovations are usually developed in a project form and there is already a lot of research in the area of innovation projects and how those should be managed. Projects however need also governance to achieve their goals.

Since many projects fail to achieve their goals, there is a need for structured, disciplined management of multiple projects (Too and Weaver, 2014) and project governance tries to provide tools and methodology to enable value creation for the organization. Project governance is the overall business function in project-based organizations (PBOs) and it provides a framework for organizational processes, decision-making models and project management tools, which support the successful delivery of projects, programs and portfolios (Biesenthal and Wilden, 2014). Project governance is closely linked to performance and is especially important in complex projects.

Müller (2009) has introduced a model where the different levels of project governance are linked together, forming a governance framework from the top management and corporate strategy to a single project level. This linkage and the relations between the project levels from portfolio to project level need to be studied more. There is a need for further research also on how organizations create this linkage in practice and what are the different ways of linking those different levels.

According to Shaker (2014) there are many common reasons why innovation projects and programs flop. The success or failure is not entirely in the control of the project manager or the project team. Projects are not independent entities and the lack of support or conflicting objectives from the top management can influence the project outcomes negatively (Too and Weaver, 2014). The lack of governance may cause the projects and programs to spread responsibility too wide across different teams and then, if the project or program proves unproductive, there is not a centralized role that is accountable (Shaker, 2014). There must be an innovation framework that covers the whole innovation process

from ideation to delivering the result. At the moment there is no research combining innovation governance and governance of projects which creates a reasoning for this study.

1.2   Research Questions and Objectives

The research concentrates on the innovation governance mechanisms of the case companies whose operations concentrate on project business. The objective is to notice the most important aspects of the governance model and try to model it. The main research questions are:

Which innovation governance mechanisms do PBOs use at the different levels of the organization?

How should PBOs improve their innovation governance to improve their innovation capabilities?

The aim is to find out how do different kinds of governance mechanisms and related flexibility, formality and decision maker engagement affect the innovation process. Especially what governance mechanisms drive innovation in organizational projects, programs and portfolios? A framework is presented to guide organizations in choosing the best suited governance mechanisms to support different innovation processes and environments.

1.3   Research Context

This Master's Thesis is done as a part of a bigger research on governance of innovation in projects, programs and portfolios in collaboration with University of Technology Sydney (UTS). The idea is to complement the Australian study through investigating different PBOs in Finland, where interviews regarding innovation governance practices in different project business levels and between these levels are performed and analyzed. Based on the analysis, proposals on how innovation governance in project business could be developed are given. A framework is presented to guide organizations in selecting suitable governance mechanisms in different environments and innovation processes. This Master's Thesis focuses on two organizations in Finland. The results can be used in further research done in TUT and UTS.

1.4   Case Companies and Methodology

Innovation governance mechanisms are not easy to measure and therefore a qualitative approach in this study is well justified. A case study is a suitable method for understanding organizational and managerial processes (Yin, 2009, p. 4) and is therefore applied in this research. Multiple cases help in creating more generalizable conclusions and discovering whether same findings recur in different cases.

The case companies are both medium-sized PBOs operating in business-to-business. The companies operate in different businesses and environments, in local and global environments and their offerings are very different from each other. Both case companies have innovation activities through which competitive advantage is sought.

The empirical data in this research is collected using qualitative semi-structured interviews performed in case companies. The interviews aim to get knowledge of how governance of innovation is done in project business in the case companies and how the company strategy is executed through innovation projects. A frame for the interviews was designed in collaboration between TUT and UTS, and it can be modified to fit the thesis topic and specific aims. Three to six interviews in each company will be conducted depending on what kind of interviewees are found in different organizational levels. The preference is to get interviewees from all project, program, portfolio and strategic levels so that a broad picture of innovation governance in organizations can be created. If possible, also other related documentation from the case companies will be used if it can be accessed and it is relevant to the thesis theme. The interview results will be shared with the project team so that those can be used in following phases when comparison between the Finnish and Australian companies is conducted.

1.5   Structure of the Thesis

This master's thesis includes five main chapters: literature review, research methodologies, research results, and discussion on them, and conclusions. The second chapter is the literature review of project and innovation governance and how these two models overlap. A framework of innovations in PBOs is presented as well as a preliminary checklist for innovation project governance.

Chapter three introduces the research methods used in this research. It presents factors affecting the chosen research strategy and procedures relating to gathering the research material i.e. conducting the interviews. In addition, procedures and methodologies related analyzing the results are introduced. The case companies are also introduced in this chapter. Research results chapter presents the main findings that can be drawn based on the interviews. The findings are divided under five categories and finally a cross-case analysis is conducted to compare the similarities and differences in the case companies' innovation governance mechanisms.

The fifth chapter discusses the results by gathering together the findings of the literature review and the company interviews and compares the findings to previous research. The main findings are related to innovation governance at different levels of project organization and the role of different actors and decision-makers in the organization. A revised checklist for helping organizations to establish innovation governance mechanisms is presented.

The last chapter contains the conclusions. It summarizes the main findings of the research and includes some thoughts about the scientific contributions of the work. Recommendations for the case companies on how to improve their innovation governance are given. The limitations of the research and possible topics for further research are analyzed.

2. LITERATURE REVIEW

2.1 The Main Themes

2.1.1 Project and Project-based Organizations

Project business can be defined as a part of business relating to projects, with a purpose to achieve objectives of an organization (Artto and Wikström, 2005). Reasons for initiating and participating in projects are to improve innovative capacity, to carry out system-wide changes, and to enhance the adaptive capability of an organization. In many cases there is a strategic target to develop new capabilities to create future business opportunities. Projects are also a way to carry out complex business transactions such as the ones in construction and software businesses. (Wikström et al., 2010)

A project can be defined in various ways, but what is common with these definitions is that a project has a beginning and an end, and it does not last forever. Artto et al. (2011, p. 16) present three parallel perspectives on a project: project as a temporary organization, project as a product structure or a work structure, and project as activities or a phased process. They also give a definition to project:

> *"A project is a unique entity formed of complex and interrelated activities, having a predefined goal that must be completed by a specific time, within budget, and according to specification."*

Examples of projects are construction projects, IT projects and new product development projects.

Figure 2.1 Four management areas of project business (Artto and Kujala, 2008) *and the focus of this research*

A project-based organization (PBO) is an organization that conducts a specific part of its activities in a project form (Artto and Kujala, 2008) i.e. the project is the primary unit of

production organization, innovation, and competition (Hobday, 2000). Conducting an organization's business through projects can involve two kinds of projects: external production or customer delivery projects, and internal development or capital investment projects (Artto and Kujala, 2008). PBOs are found in several different industries e.g. consulting, software, construction and telecommunications, where the nature of demand is differentiated and customized and clients frequently negotiate and interact with project organizers (Hobday, 1998).

Structures, strategies, and capabilities in PBOs are organized around projects, which often cross conventional industrial and organization boundaries. Often the PBO is not suited to the mass production of consumer goods, where specialization in functional lines allows the best advantages for learning, scale, and marketing. However, the project form can be utilized also within large manufacturing organizations to execute specific non-routine activities such as innovation, including R&D and new-product development. (Hobday, 2000)

The project's temporality makes PBOs inherently flexible and reconfigurable in contrast with large integrated, hierarchical organizations. Sydow et al. (2004) claim that PBOs can circumvent traditional barriers to organizational change and innovation, since each project is presented as a temporary phenomenon that allow low-cost experiments and they do not constitute irreversible resource commitments of fixed costs. In that kind of environment, it is easy to launch a variety of ventures and terminate unsuccessful ones at low cost and little disturbance to the organization.

2.1.2 Project Portfolio and Program

Highly interrelated projects that have a common goal and that are managed in a coordinated way are referred to as programs (Dinsmore and Rocha, 2012, p. 66). There is a need for a program if the goals cannot be achieved by a single project. The projects in the program should have common strategic or tactical benefits. A program should exist only if it brings benefits that cannot be achieved by managing the projects independently (Thiry, 2010, p.15). A program always has a reason for its existence, a strategic goal, that aims to create sustainable change. According to Artto et al. (2009) a program is always more than a scale-up of projects. A project often aims to concrete business results in short-term whereas a program's outcomes are broader and more indirect and may have long-term implications in the future.

Portfolios instead, can be defined as a grouping of projects and programs that have similar skills or resource needs, and that are prioritized by their contribution to corporate strategy and are managed together to optimize contribution to strategic objectives. (Müller, 2009, p. 47-48). Portfolio management has three goals: linking the portfolio to business strategy, maximizing the value of the portfolio, and creating the right balance and mix of projects (Cooper and Edgett, 1997). In the latter two, resource planning and allocation

has an important role. Managing a portfolio includes active decisions about prioritization, evaluation and selection. Some projects are terminated, some are postponed, and some are accelerated. Dynamic environment and changing strategy affects the decisions. There are also multiple decision-makers and dependencies among projects.

A portfolio can include projects and programs and depending on the size of the organization, there can be several project portfolios and programs. Portfolios and programs create frameworks where projects can be managed and governed to ensure best possible end results and optimal use of resources. Single projects can exist outside of any program or portfolio, but that is unusual since organizational strategy is linked to portfolios and programs and therefore carried out through projects in them.

2.1.3 Project Governance

Governance can be used as a synonym with the good and transparent management of organizations. Corporate governance provides a framework for ethical decision-making and managerial action based on transparency, accountability, and defined roles (Crawford et al., 2008; Müller, 2009, p. 11). It also clarifies the distinction between ownership and control of tasks. It contains defining the goals of the organization and the processes that are used to run different areas of responsibility. Corporate governance aims to enhance organizational performance and ensure returns on investment and long-term productivity growth (Dinsmore and Rocha, 2012, p. 20).

Governance also defines the processes, roles and accountabilities of the managers who perform project governance. Dinsmore and Rocha (2012, p. 27) also emphasize that roles, responsibilities, and performance criteria are clearly defined, and disciplined governance arrangements, methods and controls are applied throughout the project life cycle. The aim of project governance is to ensure a consistent and predictable delivery of projects and programs and to align them to corporate strategy and stakeholder expectations to create value for the organization (Müller, 2009, p. 23-24; Dinsmore and Rocha, 2012, p. 17).

Project governance provides risk minimization, transparency, division of ownership, and control at the project level. Because project governance aims to the consistent and predictable delivery of the project's planned contribution to the corporation's strategic objectives, it is intimately linked with corporate governance. Project governance can also be viewed as the perspective of the parent organization towards its project, which includes defining the goals, means and ends of the project, its contribution to and link with the parent organization.

In project governance literature the term project governance itself is defined in many different ways, from very narrow to very wide. There is no one agreed structure of a robust project governance model (Zwikael and Smyrk, 2015). Different project governance definitions are collected into table 2.1.

Table 2.1 Project governance in literature

Authors	Definition of project governance
Garland, 2009	• Identify a single point of accountability. • Ensure a service delivery focus. • Separate the project and the organization governance structures. • Separate stakeholder management and project decision-making.
Müller, 2009	• Fostering of an environment allowing projects to be successful. • Prioritization of projects for best use of resources. • Identification of projects in trouble. Rescue, suspension or termination of these projects as appropriate.
Project Management Institute, 2013	• The alignment of project objectives with the strategy of the larger organization.
Ruuska et al., 2009	• Principles for responding to project stakeholder demands • Documentation procedures • Communication and contractual arrangements
Turner, 2009	• Define the objectives. • Define the means to achieve the objectives. • Define the means of monitoring the progress.

Zwikael and Smyrk, 2015	• The roles, responsibilities and interaction hierarchy which includes the main players:
	   o the project owner,
	   o the project manager,
	   o the steering committee,
	   o the project team.

As from the examples taken from the literature can be seen, governance is not a simple topic. These are all good definitions and relate to the themes in this study and do not exclude each other so they can all be applied here. This study focuses on the organization's internal project governance in the context of innovation projects so none of these

definitions can be used as such to cover the whole topic. Using these examples as an inspiration, project governance in the scope of this study could be defined as follows: Project governance is needed to align project goals with the organizational strategy. It includes the roles, responsibilities and hierarchies of different actors that are related to projects, programs and portfolios. Transparent processes and decision-making is needed to achieve efficient project governance and value creation for the parent organization.

According to Ahola et al. (2014) study there are two different streams of project governance literature. The first one defines project governance as a phenomenon external to any specific project and the second as internal to a specific project. Project governance external to any specific project emphasizes the importance of projects serving as vehicles that execute the corporate strategy. This means aligning the goals of various simultaneous projects with the short-term and long-term goals of the parent organization. Also, the communication towards the project board and other stakeholders should be relevant, timely and efficient. In the context of this study the external approach is relevant.

Table 2.2 The two streams of project governance literature (according to Ahola et al., 2014)

Project governance as external to any specific project	Project governance as internal to a specific project
• Principal agent relationship between the project-based firm (PBF) and its project exists • The PBF wants projects to be executed efficiently and in alignment with their strategy • An agency problem could arise, if the project manager prioritizes the interests of the project (or themselves) over the interest of the PBF • To align the interests of the PBF and its projects and to prioritize resources in portfolio level, standardized reporting practices, roles and monitoring structures are needed	• A project is a nexus of interdependent economic transactions between legally independent firms • The project is directed by a specific joint goal and therefore is a powerful organizational actor • The goals of firms that participate to the project may conflict with each other and with the project • Governance structure including shared coordination, control and safeguarding mechanisms is needed to align the interests of several organizational actors and to work towards a joint goal • The governance structure needs to be aligned with internal and external contingencies (e.g. organizational capabilities, regulatory practices, etc.)

Project management and project governance can sometimes be difficult to differentiate. Biesenthal and Wilden (2014) and Nielsen (2010) describe project management as a tool of operational control and execution of daily work at the project level, whereas project governance is focused on the higher-level structure of defining processes and structures to govern multiple projects and to manage strategic objectives. On the other hand, the concepts can be distinguished from project performance point of view. According to Samset and Volden (2016) project management aims at reaching tactical, short-term objectives of the project whereas project governance is required to create organizational elements so that strategic, long-term success can be achieved. In this study both themes come up, but the focus is on the governance processes and definitions about different roles and responsibilities in the organization that influence the management work.

2.1.4 Portfolio and Program Governance

The projects in portfolios compete for finite number of resources which is why they need to be governed. The focus on the governance is on ensuring the *effectiveness* by 'doing the right projects' and ensuring *efficiency* by 'doing projects right' (Müller 2009, p. 45). Project portfolios and programs are a form of governing several projects in one organization. Since projects and programs are temporary organizations and each is a unique entity, their governance may vary. This is different to corporate governance which should be consistent across the organization (Crawford et al., 2008).

Program governance is needed to ensure that the program supports the organization's strategic goals. Governance is also needed to change the program in case it is not aligned with the strategy (Dinsmore and Cabanis-Brewin, 2014, p. 356). Program governance includes determining methodologies that are used, the change management processes that are followed, the type of risk management, and the quantity and quality of reporting by each project manager (Müller, 2009, p. 27). Program managers act as the sponsors for the projects in their program and are accountable for achieving the objectives of all the projects and therefore for the benefit realization of the whole program.

According to Mosavi (2014) portfolio governance is not studied widely and it is often presented as an extension of project governance even though the nature of projects and portfolios differ. He states that portfolio governance requires defining roles and responsibilities at portfolio level. According to the OGC guide (2011), effective portfolio governance includes clarity about decisions, what, how, where and by whom the decision are made. Mosavi (2014) studies the roles of portfolio committee in portfolio governance and reveals three different roles: communication and consolidation, negotiation, and decision-making. The same organization may perform all these roles depending on the situation.

The project management office (PMO) is a department with a purpose to assist and support the project managers and ensure the use of best practices across the organization's projects (Desmond, 2015). PMO can have varying roles depending on the organization and not all organizations have a PMO at all. The role can be supporting, directing or controlling depending on the organizational choices. One of the main tasks of PMO is to measure the project key performance indicators that the executives are interested in. PMO should be linked to all the project levels of the organization.

2.1.5 Innovation

Innovation can be defined as an invention that has a novelty value and that also creates benefits for the organization. An innovation can be e.g. a new product based on new technology or a new combination of existing technologies. Invention cannot be called innovation unless it sells well and produces profits. (Kettunen et al., 2007, p. 31-34). OECD Oslo Manual (2005) categorizes innovations into four types: product innovations, process innovations, marketing innovations and organizational innovations. Table 2.3 presents these innovation types.

Table 2.3 Different innovation categories (according to OECD, 2005)

Innovation type	Definition
Product	A good or a service that is totally new or significantly improved with respect to its characteristics or intended uses.
Process	The implementation of a new or significantly improved production or delivery method.
Marketing	New marketing method that causes significant changes in product design or packaging, product placement, promotion or pricing that aims to better address customer needs, open new markets or newly position a product on the market.
Organizational	New organizational method in the business practices, workplace organization or external relations. This kind of innovation is intended for increasing a firm's performance for example by reducing administrative costs, improving workplace satisfaction or reducing costs of supplies.

An innovation can include several innovation types. A product innovation may require also process innovations to produce the product. Also, a new marketing method for a new

product includes both marketing and product innovations. A new organizational method can be introduced at the same time with a new process technology.

In different organizations the scope of innovation can be defined in many ways. Sometimes innovation is defined very narrowly including only new products and new technology and is thought to be part of the R&D organization only. Deschamps (2014, p. 37) highlights that one of the key tasks in innovation governance is to promote and steer all aspects of innovation, not just new products. According to him there are three things that senior managers should consider when defining innovation:

1. The company should *innovate in all aspects*, not just products or technology, and encourage the organization to search for combined innovations. Combined innovations can bring together product concepts e.g. with new business models, processes, services, and new kind of marketing.
2. Innovation starts before and ends after new product development i.e. innovation extends beyond the traditional process. Deschamps (2014, p. 38-39) proposes eight "I-Processes" related to the broad look of innovation processes. Four relate to the creative invention phase: immersion (in the market and technology), imagination (of an opportunity), ideation, and initiation (of a formal project). The other four deal with the disciplined implementation phase: incubation (of the project), industrialization, introduction (in the market and rollout), and integration (of the offering into the customer's operations).
3. Combining top-down and bottom-up innovation is important, since even though innovation can be a spontaneous bottom-up phenomenon, sometimes it can be insufficient. Especially when circumstances or opportunities require launching a costly or complex innovation initiative, a top-down management-led innovation is needed. Understanding conditions, where both innovation types will prosper, determining their balance, and adopting management attitudes that will facilitate both modes are essential elements of innovation governance.

There are many ways to approach innovation and, in an organization, it should be critically examined how the scope of innovation is defined and whether that scope changes through time. A base and structure for innovation should exist so that the whole organization is involved in innovation activities. Almost all organizations need innovation to renew and to keep up with the competition.

2.1.6   Innovation Governance

Deschamps (2014, p. 28) defines innovation governance as a system of mechanisms to align goals, allocate resources and assign decision-making authority for innovation, across the company and with external parties. The word governance is used because innovation cannot be delegated to any single function or to lower levels of organization. It is a top management responsibility.

Innovation governance responsibilities include:

- Roles and ways of working around the innovation process
- Decision power lines and commitments on innovation
- Key responsibilities of the main players
- The set of values underpinning all innovation efforts
- Decisions that define expectations
- Measuring innovation
- Innovation budget decisions
- Orchestrating, balancing and prioritizing innovation activities across divisions
- Management routines regarding communications and decisions (Deschamps, 2014, p. 28-29)

Innovation activities in an organization can be divided into two categories: content and process. A company can address these two sides by answering some critical questions. The questions dealing with the content of the innovation efforts are the following: *Why innovate? Where do you look for innovation? How much innovation do you want?*

The first question, why innovate, seems obvious, but it highlights the importance that everyone in the organization should have the same clear understanding of the mission, purpose and objectives of innovation for the organization and how the innovation efforts relate to the overall corporate strategy. Pisano (2015) states that the reason why innovation initiatives frequently fail is the lack of an innovation strategy. According to him, good strategies promote alignment among diverse groups within the organization, clarify objectives, and help focus efforts around them. It is important for the top management to agree if innovation is a way to generate totally new businesses, to reinforce current businesses, to build a winning brand reputation and attract top talent, or something totally different.

Defining the innovation strategy leads to making decisions on where to focus and what the organization's innovation priorities are. Some would say that innovation is important in all the business areas, but it is important to focus on activities that relate to strategy and matter for the success of the company. Innovation can be focused e.g. on developing new products or services, lowering costs, or developing robust business models. (Deschamps, 2014, p. 43) Management needs to prioritize the activities and be able to change them in case of a change in economic or competitive environment.

The third content related question has two aspects. '*How much?*' can relate to both the intensity of innovation efforts and the funding of innovations. The intensity means the different levels of innovations: incremental vs. radical, new-to-us vs. new-to-the-world and how those are balanced in the innovation project portfolio. The answer to this question also determines how much risk the organization is ready to bear to meet the objective. The resource point of view is linked to this, since it must be ensured, that in case radical

innovations want to be pursued, there is sufficient funding and resources to implement and market them. (Deschamps 2014, p. 43) The most commonly used forms of funding are debt and equity funding, both having their own advantages and disadvantages (Draper, 2015). Also, a hybrid model combining these two can be used. One interesting source for innovation funding is crowdfunding, which, in addition to financial benefits, can provide valuable feedback and ideas to the organization as well as word of mouth about the new innovation (Stanko and Henard, 2016).

Defining organization's innovation governance requires addressing also the practical and project aspect of innovation. Answering these questions can help doing that: *How can you innovate more effectively? With whom should you innovate? Who is going to be responsible for what regarding innovation?*

The first question deals strongly with the decision on what kind of innovation process is used in the organization and whether it enables time and cost efficiency in new product / service development and time-to-market. The process includes organization, tools for implementation and measures for tracking the activities. But there are also organizational culture questions to be considered regarding the innovation culture where both creativity and discipline should be stimulated and risk-taking encouraged. The effectiveness includes also networking and communication inside and outside the organization and compensating individuals both for teamwork and entrepreneurship. (Deschamps, 2014, p.43)

Open innovation is becoming more and more popular, but it must be more than words. The management must define how open innovation is implemented, who are the partners the organization wants to cooperate with and on what level and what is the overall purpose of open innovation. Saebi and Foss (2015) declare that there is considerable heterogeneity in open innovation performance among companies, indicating that companies vary considerably in their abilities to handle open innovation related issues. Open innovation objectives should be clearly defined in the innovation governance agenda.

The last question to answer is equally important as the others and it includes the innovation management roles and responsibilities at all levels. It also includes choosing the overall governance model or mechanism that will stimulate and orchestrate innovation activities throughout the organization. The governance model identifies the owner of all key innovation processes and helps in deciding if innovation management responsibilities are allocated to a dedicated group of managers and what are the managers' roles, reporting levels, resources and degree of empowerment compared to the line organization and other staff functions. (Deschamps, 2014, p. 45)

2.1.7 Framework of Innovations in Project-Based Organizations

The following framework sums up the themes that were covered in chapter 2.1. Governing and managing innovation projects, programs and portfolios in PBOs requires structures. Innovation is present at all the levels of project organization from portfolio management to single project level. Innovation and project governance is included in the structures, relations, and roles presented in the framework. Organization can create optimal value from its projects only if the project outputs are linked to the organization's business strategy (Too and Weaver, 2014). That is why strategic objectives and the Board of Directors can be found on the top and are linked to the project level through the intermediate levels.
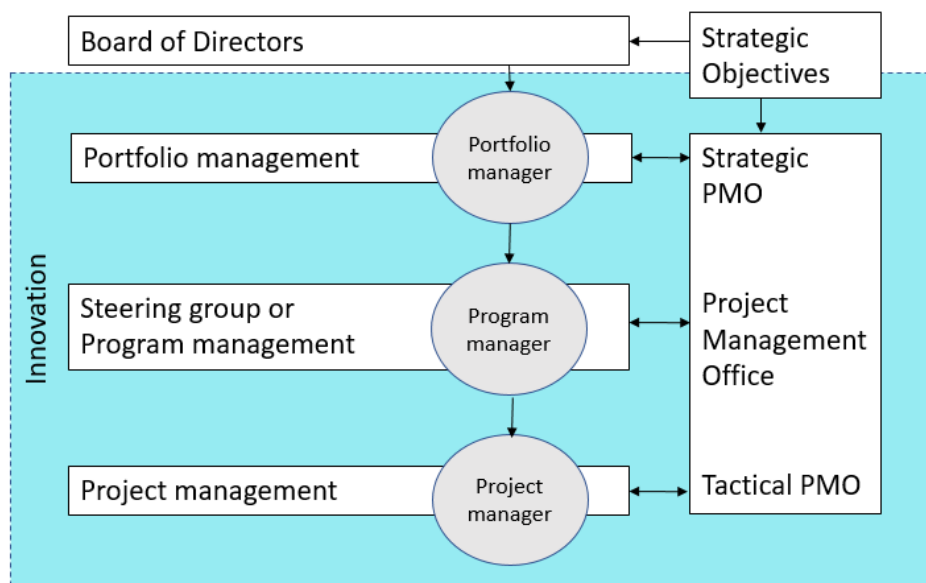
Figure 2.2 Innovations in relation to projects in an organization

The framework is an example and naturally the exact way of governing innovations varies between organizations. Small organizations tend to have less decision-making levels and structures than large corporations and therefore their framework for innovation governance might be simplified from the one above. Also, not all projects belong to a program and in fact, there might not even be a program level in all organizations. The project management office (PMO) is linked to all the components of governance to ensure appropriate information flow through the whole organization (Müller, 2009, p. 82). PMO is linked to all the project levels of the organization.

The framework shows how the hierarchy of innovation project governance is structured in an organization. It does not specify how innovation should be governed on a daily level since those are decisions that are unique to every organization and can be changed during time if necessary. It gives a top-level idea on how innovation governance works and can be visualized in an organization.

2.2   Governance in Project-Based Organizations

2.2.1   Paradigms for Project and Project Management Governance

According to Müller (2009, p. 84) project governance model used in an organization can be derived from the corporate governance orientation of the organization. An organization's corporate governance orientation can be found on a continuum from shareholder to stakeholder orientation. Shareholder theory of corporate governance assumes that the main purpose of an organization is to maximize shareholder return on investment (Tse, 2011). The structures must be chosen so that they assure managerial action is always in the best interest of the shareholders over those of stakeholders, resulting in a narrow focus on financial results measures at the expense of more qualitative objectives.

Stakeholder theory in contrast takes on account the organization's wider social responsibility. The purpose of the organization is to create wealth and value for its stakeholders (Tse, 2011). Organization's objectives should balance the conflicting interests of the different stakeholders, such as managers, employees, suppliers and the wider society. The governance of projects model aims to identify the dominant orientation.

The shareholder and stakeholder theories have also related project level governance theories. Transaction costs economics relates to the classic make or buy decision and implies that organizations adapt their governance structures to achieve the lowest possible transaction costs. In project context, transaction costs economics explains the need for different governance structures for different projects along the need for different contracts when either buying a product in the market or making it within the organization. (Müller, 2009, p. 16-17)

Agency theory relates to the shareholder theory of the organization and it addresses the conflict of interest between shareholders and managers of a firm (Shapiro, 2005). This is called the principal-agent relationship and it arises when one party (the principal, i.e. the shareholder) depends on the other party (the agent, i.e. the manager) to undertake an action on the principal's behalf and their interests typically diverge if both are trying to maximize their individual gains (Eisenhardt, 1989). Also, the principal cannot perfectly and without cost monitor the actions of the agent nor monitor and acquire the information available to or possessed by the agent. At the project level the project sponsor can be seen as the principal and the project manager as the agent (Müller, 2009, p. 18).

The second dimension separates the type of priorities organizations assign to the project process or the project outcome. Behavior oriented organizations emphasize the importance of following a strict project management process to accomplish project outcomes. On the contrary, organizations that focus on goal accomplishment by controlling outcomes are outcome oriented. These kinds of organizations give more autonomy to the

projects and project managers than in behavior-oriented organizations. The combination of these two approaches and the corporate shareholder or stakeholder philosophy provides four different governance paradigms.

Figure 2.3 *Four governance paradigms (adapted Müller, 2009, p. 20)*

The *flexible economist* paradigm with focus on shareholder-oriented organization and an outcome control aims to achieving the highest possible return on investment by flexibly applying the most effective project management methods, tools and techniques and management approaches for projects (Müller and Lecoeuvre, 2014). The underlying assumption in this paradigm is that well educated and experienced project managers will be able to identify the process that delivers the most economical result and saves costs through professional management of the project (Müller, 2009, p. 21). If an organization with stakeholder orientation uses outcome as their control mechanism it is described as using a *versatile artist* paradigm. The aim is to maximize benefits through balancing the diverse set of requirements arising from the different stakeholders. The underlying assumption in this paradigm is that versatile and experienced project managers can balance diverse and conflicting requirements (Müller and Lecoeuvre, 2014).

A shareholder-oriented organization with a behavior control focus is called a *conformist* paradigm. In this paradigm conformance and compliance with existing methodologies and processes are emphasized (Müller and Lecoeuvre, 2014). The assumption is that efficiency is achieved when processes are followed. This is suitable in environments with a relatively homogeneous set of projects (Müller, 2009, p. 20). The project management task is understood as an on-the-side task of a leading technical expert or specialist. The *agile pragmatist* paradigm is used by stakeholder-oriented organizations with behavioral control focus. The paradigms aim to balance the diverse requirements of a variety of stakeholders by maximizing their collective benefits through the timely development of functionality or value. The assumption underlying this paradigm is that a limited but key functionality allows for a limited but early use of the new product. This is true especially in software development. It allows for flexibility and frequently changing requirement from project stakeholders (Müller and Lecoeuvre, 2014).

These four paradigms are not mutually exclusive. Different paradigms may be exercised in different organizational units, depending on their contribution to the corporate strategy. For example, in R&D department the orientation might be strongly a stakeholder and in maintenance department a shareholder orientation. This model connects corporate governance and governance of projects.

2.2.2 Project Manager, Project Sponsor and Steering Group

Project manager can be held accountable for delivering the project's output within agreed timeframe and budget (Zwikael and Smyrk, 2015). Because of the project's limited time of existence, the project manager cannot be held accountable for the project's long-term benefit realization. According to principal-agent theory the project manager acts as an agent. The project funder or sponsor can appoint a project owner to act as a principal for the project manager (Müller, 2009, p. 26). The project sponsor often does not have time to be actively involved with the project after the funding for the project has been approved, so a project owner taking the responsibility for benefit realization and overseeing the project development is needed. The project owner is a part of the steering group and applies authority and control over the project team, and sets the project targets (Ahola et al., 2014).

Without a clear governance structure there is a risk of conflicts and inconsistencies between the different means of achieving organizational goals that in turn can cause inefficiencies which can impact negatively on both smooth running and bottom line profitability (Müller, 2009, p. 11-12). A functioning steering group together with active ownership, project management and committed participants have an important role in achieving the project goals (Arnesson and Albinsson, 2014).

The core institution for the governance of projects is the steering group. Its task is to create the project plan and project directives. Often the members of the steering group are from the line organization that will receive the project outcomes after the project is finished (Arnesson and Albinsson, 2014). The steering group has the ultimate responsibility for project success, therefore it owns the business case and is accountable to upper management for the project outcome, objectives and benefits. Steering groups are also the links between the permanent and the temporary organization. One of their responsibilities is to ensure effective coordination of governance mechanisms between the project and its parent organization.

A program might also have its own steering group, which is accountable for the whole program's benefit achievement (Müller, 2009, p. 27). A steering committee or a governance board is needed for overseeing the program. The board's tasks include conducting periodic reviews, performance reviews, and accepting new projects as part of the program as well as the completion of projects and closure of the entire program. The board has an important role in supporting the program manager and helping in resolving issues and

risks and determining if these issues and risks affect other programs and projects in the organization.

The steering group has many roles and one is to set up the governance infrastructure for the project. That includes defining and communicating the project governance processes, the means of controlling projects, and the roles, responsibilities and approval authorities to appropriate parts of the organization. The organization's governance infrastructure framework will be set up according to the underlying governance paradigm. Governance framework may be more process and control oriented, stressing the need for planning and plan conformance, a process discipline and clear lines of responsibility. On the other hand, the framework can be more outcome oriented, giving more trust and autonomy to the project itself and focusing more on the end product than the process of getting there. (Müller, 2009, p. 63).

2.2.3 Portfolio Management and Governance

Portfolio management aims to ensure that projects in the portfolio remain aligned with the organization's strategy. It includes looking at competing investment opportunities and prioritizing those that promise the greatest impact on strategic objectives (Dinsmore and Rocha, 2012, p. 41-42).

Value is the key element in portfolio decision-making. However, assessing overall portfolio value is complex. The overall portfolio requires a balanced set of projects so that alignment with resource availability and company strategies can be ensured. That is why a structured approach is needed. Project portfolio management is the bridge that connects strategic decision-making to project execution. The process of choosing the right projects and making sure the projects are done right is highly iterative and includes sub phases. (Dinmore and Rocha, 2012, p. 71). The prerequisite of effective portfolio management is an appropriate communication structure where information flows from portfolios to projects and back again (Müller 2009, p. 49).

Part of portfolio management is also the termination of strategically unfit projects. Unger et al. (2012) study the level of senior management involvement in the termination quality of projects that positively affects the portfolio's strategic fit. They find that there is an optimal level of senior management involvement that helps in terminating unfitting projects actively as well as selecting the correct projects to the portfolio. Too heavy involvement may cause the senior managers to over-steer the projects and favor pet projects that should be terminated.

When the managers have a clear understanding of their role in portfolio management they can follow a set project selection and termination routine which leads to transparency and better decisions (Blichfeldt and Eskerod, 2008). Termination of projects should not be considered as a failure but a valid option in portfolio management (Herfert and Arbige,

2008). The portfolio management should help in creating an environment where project terminating is a normal part of how PBO works. The evaluation of innovation projects however can be hard due to their newness and because of that there is less available information about them to help with the decision-making (Schmidt and Calantone, 1998).

2.2.4 Governance of Projects: Linking the Governance Between Different Organization Levels

The governance of projects, programs and portfolios are not separate entities but have to be linked together, so that a clear picture of the objectives of the different governance institutions can be created (Müller, 2009, p. 80). This also has an impact on the responsibilities, metrics, tools and organizational outcomes. Table 2.4 shows an example of these linkages between different organizational levels.

Table 2.4 Example of organizational linkage (according to Müller, 2009, p. 80)

Organization	Responsibility	Objectives	Metrics	Tools	Outcomes
Portfolio mgmt.	Selecting and prioritizing projects and programs Terminating strategically unfit projects	Achievement of strategic objectives	Measures of strategic goal achievement	Profit and Loss Utilization	List of prioritized projects Resource requirement for line mgmt.
Line mgmt.	Provider of skills and resources for programs and projects	Organization's annual plan achievement	Budgets Availability of skill sets Staff development	Utilization reports Resource database Resource mgmt. tools	Skills available in sufficient quality and quantity
Steering group	Achieving business case	Program and project success as a contributor to business case	Business case measures Planned benefits	Business case Project/program status report Governance policies	Resources in place Governance and support for project/program
Program mgmt.	Benefits creation Stakeholder management Project governance	Delivery of Benefits	Measures of how well benefits were delivered	Electronic tools Status reports	Governance framework Stakeholder mgmt. Benefits delivery
Project mgmt.	Delivery of project outcomes	Time, cost, quality and other success factors	As specified in contract (for example, performance or specifications)	Electronic tools Status reports	Project results as required

Organiza-tion	Responsibility	Objectives	Metrics	Tools	Outcomes
Strategic PMO	Improve effective-ness achieving stra-tegic objectives	Portfolio opti-mization Organizational project manage-ment maturity	Measures of cor-porate strategy Maturity levels	Consolidated status reports and their analy-sis	Portfolio analy-sis and decision preparation for portfolio man-agers Increasing or-ganizational ma-turity
Tactical PMO	Control compliance with existing stand-ards and best-prac-tices	Supporting pro-jects to become more efficient and effective Train project managers	R-Y-G status of projects Percentage of 'red' projects against total number of pro-jects Organizational wide acceptance of methods and techniques	Project and pro-gram manage-ment methods, techniques and tools	Applied best-practices in pro-jects Better project results

The hierarchy of the actors in project governance is summarized in the below figure 2.4. There the managers are acting as agents and their principal is the level above them. The project management office (PMO) is linked to all levels to ensure appropriate information flow through the organization.
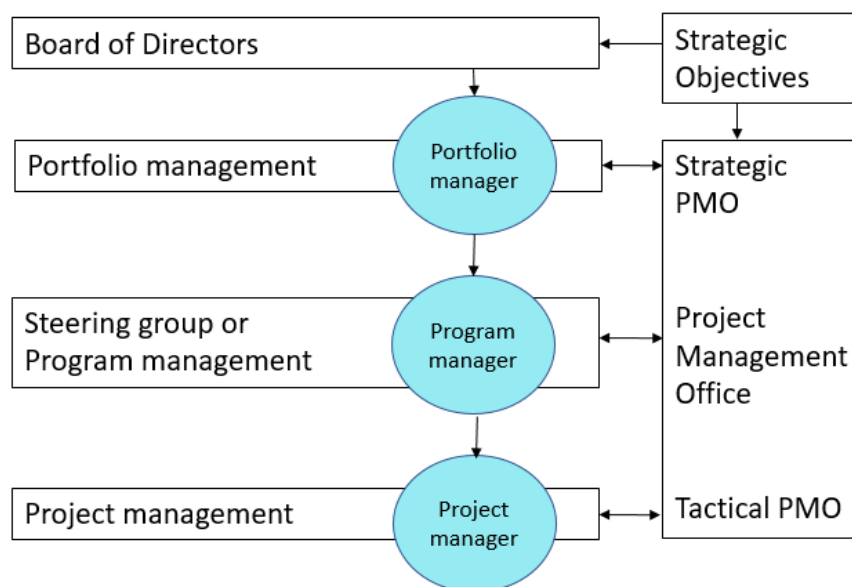
Figure 2.4 *Project governance hierarchy (adapted Müller, 2009, p. 83)*

There are clear roles & responsibilities in every level and every organization should be able to define these to ensure effective governance structures and through that effective benefit realization of projects, programs, portfolios and eventually corporate strategy. On an organization, the role of PMOs should be valued and decided whether those are needed and on what level. The bigger the organization in terms of project, program and portfolio quantity, the bigger the importance of good and transparent governance structures through the whole organization.

Too and Weaver (2014) present in their study one example of project governance framework that highlights some of the roles that are also present in the above figure. They highlight the clear separation of governance and management. The elements of the governance framework are presented in table 2.5.

Table 2.5 Four elements of effective project governance (Too & Weaver, 2014)

Element	Role and task
Portfolio management	• Selecting right projects and programs that support the strategy • Terminating projects that do not contribute value to the organization
Project sponsorship	• Providing link between the executive and project or program manager • Focusing on the project lifecycle leading to the delivery of value
PMOs	• Providing oversight and strategic reporting capabilities
Projects and programs	• Highlighting that the measure of an effective governance system is the effective management of projects and programs

Good governance is about achieving optimal balance between these four elements. Both frameworks emphasize that effective governance of projects starts from the corporate governance and should link all the project levels together. Clear roles and responsibilities are needed, and projects need the body of governance around them to be able to achieve goals effectively and create value for the organization and project client. Eventually, governance is meant to make managing PBOs easier.

2.3 Innovation Project Governance

2.3.1 Innovations as a Strategic Target

In today's fast changing world innovation is vital for firms to enter new markets, increase market share and ensure competitive edge (Gunday et al., 2011). Because of increasing competition globally and rapidly changing technologies, the focus on innovation is strong and therefore it has a big impact on the organization's strategies (Karlsson and Tavassoli, 2016). According to Pisano (2015) the reason why many organizations have problems with innovation improvement efforts is the lack of an innovation strategy. Many firms have different kinds of innovation best practices in use, such as rapid prototyping, open innovation, external alliances, decentralized autonomous R&D teams, etc. But these efforts are not efficient without an innovation system that dictates how innovation is searched and selects which projects get funded. If a firm does not have an innovation strategy, they cannot make trade-off decisions and choose all the elements of the innovation system.

All organizations should define their own innovation system since no one system fits all organizations equally well or works under all circumstances. A specific innovation strategy helps to design a system that matches the organization's specific competitive needs (Pisano, 2015). Karlsson and Tavassoli (2016) studied different organization's innovation strategies and found out that there are sixteen different strategies that organization's commonly use. These are based on the different innovation types (process, product, marketing and organizational) and their combinations. Of course, some organizations do not have an innovation strategy at all since they might have access to unique resources, lack of skills or resources, bad management or even pure inertia.

Innovation strategies are influenced by numerous factors inside and outside the organization. R&D is one of the determinants of innovation, but innovation and R&D are not synonyms since innovation can also be based on new combinations of resources, people, ideas, knowledge and technologies (Karlsson and Tavassoli, 2016). The innovation strategy a firm chooses is influenced by the firm's prior information and knowledge resources, external networks and capabilities to utilize information and knowledge. There seems to be a path-dependency and therefore firms in the same industry might follow different innovation paths.

Innovations have many positive effects on an organization's performance and competitive advantage (McAdam and Keogh, 2004). The effects vary on a wide scale from sales, market share and profitability to productivity and efficiency (OECD, 2005). According to Gunday et al. (2011) organizations that develop innovations in a decisive way also had more qualified workers, paid higher salaries and provided more conclusive future plans for their employees. Direct effects of innovations on an organization's performance are few, but indirect benefits can be found. All in all, it seems that innovative organizations

are less sensitive to cyclical sectoral and environmental pressures than non-innovative organizations (Gunday et al., 2011).

2.3.2 Creating Innovation Governance for the Organization

According to Deschamps (2014, p. 60-61) the top management team should regularly reassess the organization's current innovation system and introduce new innovation governance guidelines. There are at least six priorities that have to be considered when governing innovation effectively. First, an overall frame for innovation has to be set by clarifying innovation vision and mission, proposing a set of values that guide innovation activities and auditing current performance. To be able to do that, an innovation strategy must be defined (Pisano, 2015). Second, there are aspects concerning value that innovation creates, how the sources of value will be identified and how the value is captured.

When the base for innovation is clarified, the organizational models for the allocation of primary and supporting governance responsibilities have to be chosen. Then, dedicated process management mechanisms have to be set up. Innovation strategy and plan that is based on the organization's objectives will help in establishing priorities and allocating resources for innovation. According to Pisano (2015) an organization needs to have an innovation system i.e. a set of processes and structures that define how the organization searches for problems and solutions, turns these ideas into concepts and designs and prioritizes the project funding. Samset and Volden (2016) highlight the choice of concept as a key to successful projects.

Obstacles in the organization's organizational system and sources of resistance have to be identified and solved so that a lasting innovation environment can be built. The results have to be monitored and evaluated on an ongoing basis, and a process to address conflicts of interest within the top management team has to be set up in order to make innovation sustainable. (Deschamps, 2014, p. 74-83) These actions condition the way innovation is carried out and sustained by the organization and thus belong to the prime innovation governance duties of the top management team.

In the innovation projects, the importance of front-end decision-making phase must be recognized (Samset and Volden, 2016). Enough resources should be used in the planning phase when choosing the concept and right idea. The problem is that the uncertainty is high in the beginning and the amount of available information is low. This often leads to a paradox where most of the resources are used on detailed planning and engineering in the implementation phase when most of the choices are already locked and cannot be changed. The choosing of the right concept is important for the strategic success of the project. Equally important is to include in the governance scheme an evaluation phase after the project is finished to see what was done right and what should be done differently and to use these learnings in the future projects.

2.3.3   Innovation Project Processes

In the best performing organizations innovation does not happen randomly, but is managed through a defined process (Kettunen et al., 2007, p. 85). The innovation process is an important conceptual framework for managing innovation. As with all innovation related activities, the innovation process should be guided by the chosen innovation strategy. Karlsson and Tavassoli (2016) define innovation processes as firm-specific dynamic processes governed by the firm's innovation strategies and that firms source, transform and exploit new and existing information and knowledge using their innovation routines and the skills and knowledge of their employees.

Developing an innovation can be seen as a sequence of activities. The research & development phase can be divided into fuzzy front-end (FFE) and new product development (NPD) activities. After NPD, commercialization and market entry takes place. These phases are often divided also to idea generation, idea selection (screening), development, and launch to the market (Salerno et al., 2015).

Stage-gate model

Most widely used innovation process model is Robert Cooper's stage-gate model (Kettunen et al., 2007, p. 92; Schilling, 2013, p. 242). The basic idea in the model is to divide the innovation process into separate phases that have clearly defined deliverables which are then reviewed in the gates. Depending on the result of the gate review, the deliverable should pass redefined criteria to be able to move to the next phase. Otherwise it can be put to hold, redirected/revised or killed. One of the benefits of these decision points is the possibility to terminate the development project in the decision points and avoid pushing forward bad projects that have a negative expected value (Schilling, 2013, p. 242).
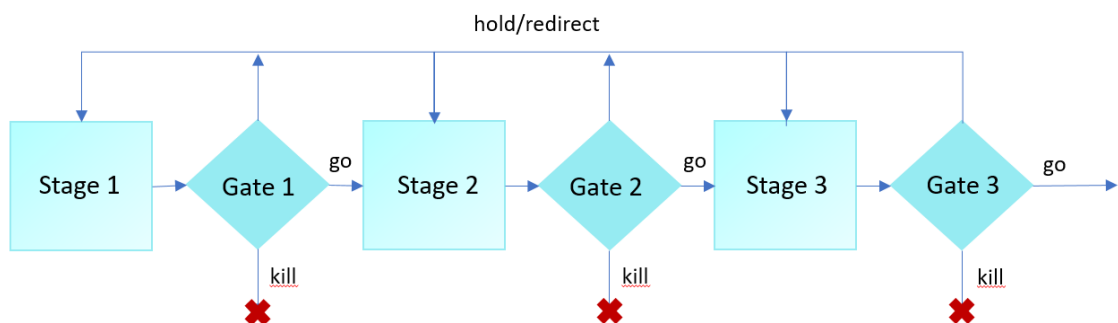

Figure 2.5 *Stage-gate model*

Trott (2017, p. 506) argues that here are some limitations to the stage-gate model. The process is sequential and can be slow and is focused on the gates rather than the customer.

Product concepts can get a kill decision too early. There is a risk of stage-to-stage information dependency as well as a risk to poor judgements by the gatekeeper if they have a low level of knowledge. These kinds of linear models often reflect reality poorly.

Shenhar (2001) argues that different kinds of projects need different management styles and Salerno et al. (2015) claim that also innovation processes can and should be managed differently depending on the project type. The rational view of project management sees projects with clearly defined goal within a specified period of time and having a certain budget and quality requirements. This does not fit well into the logic of innovation and exploratory projects that are characterized by divergence, discovery and unforeseeable uncertainty (Lenfle, 2016). Especially projects with high degree of uncertainty and complexity, such as radical innovations, do not adapt well to linear models such as the stage-gate model. (Salerno et al., 2015; Trott, 2017, p. 507). The traditional models focus mainly on the NPD process even though managing the earlier FFE as well as parallel and later phases are equally important. Since one size does not fit all innovation projects, an organization should take this into account when choosing innovation processes that are used.

Agile methodology

Innovation projects can also be managed using agile methods. Agile methodology is mostly used in software development but can be utilized in other industries as well. In fact, agile methodologies are made for constantly changing requirements and uncertainties which is why they suit well for innovation projects (Ciric et al., 2018). The aim of agile methodologies is to decrease sub-optimization and increase productivity and innovation (Lappi and Aaltonen, 2017). Agile development does not rely heavily on methodologies, rather the role of cross-functional teams, their training and skills is emphasized. In agile project management, developing the innovation outcome is done in small pieces that enable quick changes and adjustments which makes the project able to create value for the project's clients and deliver the project fast.

Agile development is usually done in small steps called sprints. Before the sprint, which can be 1-4 weeks, there is a sprint planning where it is decided what will be done during the sprint i.e. the team commits to a set of deliverables that they estimate can be finished during the sprint. The team also identifies the tasks that need to be done so that the goal can be achieved and the deliverables, often called user stories, can be completed. Product owner, who owns the business case and is the only one authorized to assign work for the team, has prioritized the user stories before the planning meeting (Sims and Johnson, 2012). Figure 2.6 presents agile development.
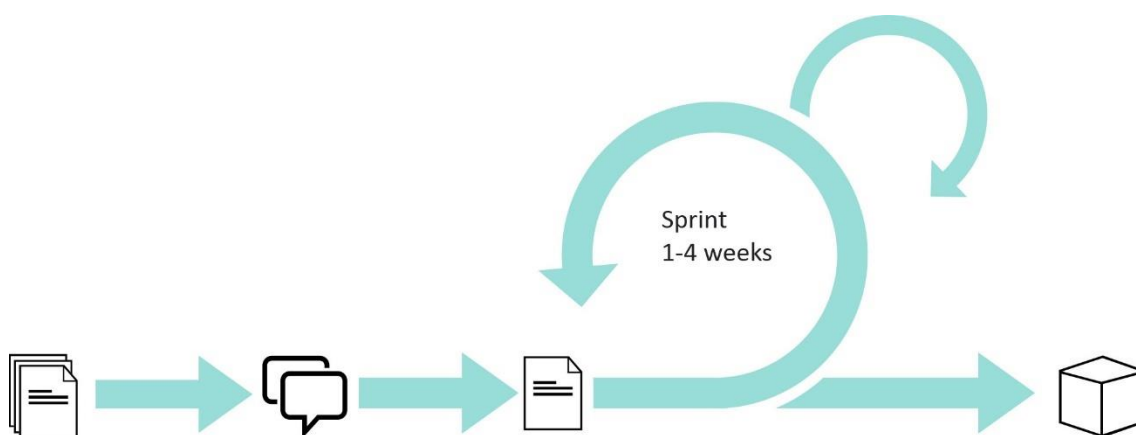
Figure 2.6 Agile development

During the sprint there are daily stand-up meetings to follow how the work is progressing and that obstacles can be noticed and removed. After the sprint a sprint review is held. All the stakeholders can participate in this and the team can show how the end deliverable has been improved during the sprint. The team has a retrospective before the next sprint to inspect and adapt i.e. continuously improve their processes and change the way they are working and how the development is done. (Sims and Johnson, 2012) This ensures that also late changes can be adapted much easier than in traditional processes (like waterfall process) and value for the customer can be created.

The study of Lappi and Aaltonen (2017) in public sector highlights that project governance, especially decision-making authority, and the responsible organizational structure should be transparent and unambiguous to enable agile project performance. Achieving this is hard if the project crosses many organizational boundaries and can make the responsibilities of the project owner and project sponsor challenging. Also, the PMO should possess tools and competences that support agile. These research results imply that if agile methodologies are wanted to be applied in innovation project governance, the whole project organization should engage in these methodologies for the project to be successful.

2.3.4 Ideation Portfolio Management

The front-end of innovation is usually described "fuzzy" and it is not understood as well as the following new product development phase. It is still recognized as an important driver for successful products and business (Kock et al., 2015; Samset and Volden, 2016) and therefore is a very important part of innovation process. Ideation portfolio management means combining two contradictory aspects: creating a sufficient number and variety of high-quality ideas and selecting and prioritizing promising ideas since resource constraints do not allow the development of every idea. A portfolio view, instead of a single project perspective, is needed to achieve this.

According to Khurana and Rosenthal (1997) the processes and activities in the front-end are product strategy formulation and communication, opportunity identification and assessment, idea generation, product definition, project planning, and early executive reviews. A portfolio view in the form of ideation portfolio management is needed to support both the generation and selection of ideas. Ideation portfolio management can be divided into three elements: ideation strategy, process formalization and creative encouragement (Kock et al., 2015). All these elements contribute to front-end success and therefore also to business prosperity.

The ideation strategy refers to the importance to align idea generation and selection activities with the organization's innovation strategy so that the ideas are consistent with the corporate strategy (Kock et al., 2015). The degree by which front-end activities and idea evaluation and selection are governed by rules and procedures is defined by process formalization (Martinsuo and Poskela, 2011). Finally, creative encouragement is defined as the managerial support and autonomy that is given to the employees so that they can pursue creative tasks (Mainemelis, 2010). All of these strategies should be adopted at the same time because they have complementary effects on the front-end performance and indirectly also to the portfolio success.

2.3.5   Innovation Portfolio Management Governance

According to Urhahn and Spieth (2014) good portfolio management governance enhances the organization's innovation abilities through market and technological aspects. Innovation project portfolio management is needed to balance the need for steady stream of successful innovation ideas and the optimal allocation of scarce resources (Lerch and Spieth, 2012). The decision-making in portfolio level can be complex. The steering, guiding and directing the project management process has a positive effect also for the innovativeness and therefore should be focused on. This increase in innovativeness also has an effect for the overall performance of the organization. (Urhahn and Spieth, 2014)

According to the research, good project selection methods are not enough to create successful portfolio management but governing the process is important for enhancing the innovativeness of the new product portfolios (Urhahn and Spieth, 2014). The governance process includes the decision-makers' timely access to relevant and accurate information. There should also be defined rules and criteria for the application of portfolio management and those should be applied in regular portfolio reviews.

However, decision transparency does not have a significant effect on portfolio innovativeness. According to the researchers this might be due to the fact that radical innovations face internal resistance because of their possible long payback periods and uncertainty of success. Hence, courageous decision-making is needed and transparency in decision-making could be detrimental. (Urhahn and Spieth, 2014)

2.3.6 Different Innovation Governance Models

According to a study conducted by Deschamps (2014, p. 87) most companies have an innovation governance model that they can describe. Still, few organizations have a systematic way to identifying and comparing different governance approaches. Also, when the current model does not seem to be working, organizations are not able to review other possible models to replace the existing one. The top management often lacks clarity and comprehensiveness in the way governance is understood and different managers can describe the same organization's governance differently. That is why it is important to specify the range of possible models so that organizations can be more reflective and explicit when choosing a governance model that best fit their current conditions.

Innovation is an effort that crosses the whole organization and since people in an organization have different roles, responsibilities and goals, there has to be a way to align their efforts for innovation to be successful. Innovation efforts also need to be in line with the overall strategy and goals (e.g. Müller, 2009; Dinsmore and Rocha, 2012; Pisano, 2015). Top management has to decide who is responsible for innovation in the highest level and who will play a supporting role. These primary and supporting responsibilities create the governance model. The board of the organization should play an important and supportive role in innovation and its governance and not be merely informed of strategy and outcomes and leave the innovation only to the employees (Deschamps, 2014, p. 87).

There are three key tasks related to the implementation of an innovation governance model: *assigning primary responsibility, defining the scope and level of responsibilities, and planning support mechanisms* (Deschamps, 2014, p. 87). These tasks ensure that the governance model is explicit, and everyone knows who holds the primary responsibility for innovation. Considering the allocation of responsibilities there are two choices to be made. Is the responsibility on one manager or leader, a duo of managers, or a group of leaders and what is the allocation they have for that duty? The other choice is about the management level of the appointed people and who they report to.

Deschamps (2014, p. 95) introduces nine different governance models, ten if "no one in charge" is included. These governance choices are presented in table 2.6.

Table 2.6 Different innovation governance models (adapted Descamps, 2014, p. 95)

1.	The top management team (or a subset of that team) as a group
2.	The CEO (Chief Executive Officer) or group/division president (in multi-business corporations)
3.	The high-level, cross-functional innovation steering group or board • Chair of the group CTO (Chief Technology Officer), CRO (Chief Research Officer)
4.	The CTO or CRO as the ultimate innovation champion
5. & 6.	The dedicated innovation manager or Chief Innovation Officer (CIO)
7.	A group of innovation champions
8.	No one in charge
9. & 10.	The "duo" or the complementary two-person team.

As seen above, there are many ways to organize innovation governance and often those different models are used together, so that one model is supporting the other. If several models are used at the same time, there is a danger that the ultimate responsibility is not centralized which might cause problems. Of course, none of the models are perfect and organizations may have to change to another model when circumstances change. For example, in Apple, Steve Jobs as CEO was clearly the innovation champion and after his decease the organization may have been forced to change their innovation governance model e.g. to top management led model.

Figure 2.7 Who is in charge of innovation? (adapted Deschamps, 2014, p. 92)

The models also include the opportunity of no one being in charge. There might be several reasons for this. One is that the organization has innovation so deep in their DNA that everyone feels responsible and support the innovativeness. Other reason could be that the circumstances, like reorganization of the organization, is temporarily causing the absence

of an innovation governance model. This could be a problem if this kind of reorganizing is done often. Reason for not having an innovation governance model can also be that innovation is not perceived as a critical matter by the management. These are typically found in domains where the emphasis on operational excellence is strong, such as the shipping industry. (Deschamps, 2014, p. 96)

2.3.7 Effective Innovation Governance

Organizations can choose from many different innovation governance models and combinations and none of the models is directly better than the others. In fact, innovation performance is often not directly dependent on the governance model used. It is rather the reflection of the top management commitment and engagement, and the credibility, skills, and energy of the actors who undertake the governance mission (Deschamps, 2014, p. 240). So, the chosen innovation governance model itself does not guarantee success, but the way the model is implemented reflects the level of satisfaction.

There are several evaluation criteria that can be used when reflecting the effectiveness of the governance model. These are not model dependent, instead they reflect how the model has been implemented in an organization. Eight different success factors are covered here (Deschamps, 2014, p. 240).

1. The top management team, starting with the CEO, is genuinely committed to turning innovation into a core competence of the organization.
2. Innovation governance model handles all facets of the organization's innovation agenda, including strategies and plans for new products and technologies, processes, culture and values, and resources in terms of people, skills, and budgets.
3. The model is not overly dependent on the unique skills and personality of one person (e.g. the CEO). This can be avoided by coaching potential employees and building organizational mechanisms to leverage their strengths.
4. The model and its key actors gather support from the rest of the organization. Usually, the higher the level of the initiator, the more support is gained. Also, communication and concrete actions are equally important. Performance evaluation should also be in line with the new priorities.
5. Processes and tools for continuous performance evaluation and improvement are included in the model so that the model can be developed, and roles changed if needed.
6. The model is robust vis-à-vis external pressures and crises. One way to ensure this is to keep the innovation system and budget lean, also in favorable times. Also, one or several high-level innovation advocates help in maintaining the focus on innovation through the time of crisis. Third way is to isolate the innovation budgets from the other budgets in business units.

7. The model evolves, enlarges its scope and grows with the company. Sometimes growth requires changing the model altogether and sometimes the change is subtler.

8. The governance model is understood by the board of directors, the results of the organization's innovation audit are presented to the board at least once a year, and future issues are discussed (Deschamps, 2014, p. 240).

The top management should take time to reflect how the organization's governance model meets these eight success factors and after that take corrective actions if needed.

As with projects in general, effective innovation project governance can be defined similarly. Innovation project governance should include clear roles and accountabilities in all the levels as well as transparent decision-making and reporting processes. The project governance model should be chosen to match each project's characteristics, the same processes do not necessarily fit for all projects. The governance models used in every level should be reviewed critically from time to time to achieve continuous improvement and again to gain best possible strategic match and effectiveness with the innovation projects.

2.4 Synthesis

The previous chapters contain important research material and aspects of project governance and project management levels, innovation and innovation governance as well as PBOs. However, these research areas have not been studied together and there is a clear lack of research in the field of innovation governance. Deschamps (2014) uses the term innovation governance but he does not link it to project governance even though innovations are most often realized through projects. Especially the roles and decision-making in innovation governance has not been studied widely. Based on the findings in the literature review, the term innovation governance is not widely used and the literature in that area is limited. This research seeks to find examples of how innovation governance is structured in PBOs.

The previous research has revealed that governance mechanisms in every project level are needed to ensure the effective and strategically beneficial project and program implementation. This applies to all kinds of projects including innovation projects. The linking of corporate strategy and innovation strategy to the single project level is very important. Emphasis should also be put to the early project phases i.e. the fuzzy front-end (Kock et al., 2015).

Research in the project governance area exists but a coherent definition of the term is still missing (e.g. Zwikael and Smyrk, 2015; Lappi and Aaltonen, 2017). A choice of proper and suiting definitions in the scope of this study have been made. The literature found for the literature review was based quite heavily on the governance mechanisms that should be used in PBOs not necessarily on the mechanisms and structures that are actually used.

In addition, the innovation point of view was missing in many studies, so the role of possible Chief Innovation Officer or Innovation Manager in relation to governance of projects was missing. The question about right amount of governance in small and medium sized companies is interesting and the empirical research tries to shed light into that aspect.

Table 2.7 summarizes the literature review and introduces the main factors that have to be considered in an organization's innovation governance. The questions in the table offer a checklist that can be used to form and review the organization's innovation governance model. The questions are meant to help in discussion about the innovation activities in the organization and not give straight answers on how innovation governance should be formed.

Table 2.7 Innovation project governance checklist

1.	Does the organization have an innovation strategy?
2.	What is the governance paradigm used in innovation context?
3.	Is the innovation project portfolio aligned with the organization's strategy?
4.	Who is in charge of innovation in the organization? • Who has/have the supporting role?
5.	Is the project selection and termination process transparent?
6.	Are PMOs used in the organization? What is the role of PMOs?
7.	What are the different roles and accountabilities in different innovation project levels? Are those clearly defined? • Who is responsible for the project target setting and benefit realization? (project sponsor, project owner) • What about in program level? • Who defines the governance infrastructure for a project?
8.	What is the innovation system used? (processes and structures that define how the organization searches ideas, turns them into concepts and prioritizes the funding)
9.	Is the front-end of innovation managed, is there ideation portfolio management?
10.	What kind of innovation process(es) are used? How is the governance structured in a particular project? (steering group)
11.	Does one process suit for all the projects? What possibilities are there? What is the project type?
12.	How often is the innovation governance model reviewed?

The questions start from the strategy level to portfolio, program and project levels. The checklist can be used in all the project levels, but it suits best the situations when the organization's innovation activities are reviewed in the top management level. Naturally,

the top management team should not steer individual projects, but decide how much decision-making power are given to the steering groups and projects themselves on deciding for example the processes that are used in project level. These decisions have linkage to the governance paradigm the organization identifies itself with. There is no one specific way how innovation governance should be formed in an organization. The checklist should make easier to connect the different levels and aspects of innovation governance. The checklist is reviewed and updated based on the results from the case companies.

3. RESEARCH METHOD

3.1 Research Design

This research tries to shed a light on innovation governance mechanisms used in different companies. The phenomena related to these mechanisms are not easy to measure and therefore qualitative methods are well suited and justified in this research. A multiple case study strategy was applied in this research. When the research aims to understand a real-life situation holistically, such as organizational and managerial processes, a case study is a suitable method (Yin, 2009, p. 4). In this research the phenomenon is the innovation governance mechanisms that are used in a company. In case study, the boundaries between the phenomenon and the context within which it is being studied are not clearly evident.

The case studies can be divided into single and multiple case designs and holistic and embedded case (Yin, 2009, p. 46). In this research, a multiple, holistic case design was chosen meaning that more than one cases were selected and those were studied as a whole (not divided into multiple units of analysis as in embedded study). The use of a multiple case study is justified, when the focus is on establishing whether the findings of the first case occur in other cases and, as a consequence, generalizations could be drawn (Saunders et al., 2009, p. 146).

In this research, semi-structured interviews were used as the main data collection method. The interviews were structured around the themes that wanted to be explored to be able to answer to the research questions. The semi-structured interview gives the interviewer the opportunity to ask additional questions and lead the discussion into areas that the researcher had not considered previously, but which will help to address the research question and objectives. As a result, a rich and detailed set of data will be collected. (Saunders et al., 2009, pp. 320-323)

3.2 Case Companies

Two case companies were studied in this research. The companies were selected based on their activities as project-based organizations and the knowledge that they have released innovative solutions in recent years. Since this research is conducted in collaboration with another research group as a part of a larger research on this area, organizations from different industries wanted to be included to get a wider perspective on project and innovation governance. These two case companies represent the medium-sized PBOs.

One of the research companies operates in the IT industry and the other in construction industry. In this research the case companies are called Company A and Company B in

order to maintain the anonymity of the companies. Both are growing Finnish companies that have gained a foothold in their industries. Table 3.1 contains some basic information about the selected case companies.

Table 3.1 Background information of the case companies

	Company A	**Company B**
Industry and business type	Software solutions Project-based	Construction and related services and software Project-based
Net sales 2017	> 50	> 200
Number of employees	> 400	> 250

Company A offers software mainly for other businesses and their main focus is in the development of their core product. The company has several technology partners with whom they develop compatible software solutions. They also offer technical support, consultancy services and training related to their products. The company's core product was a big innovation when it was first released, and it still is, compared many of their more traditional competitors. Company A released last year (2017) a new, innovative AI based feature to their core product. The company has got several recognitions for being innovative and visionary in their field. It is also one of the fastest growing European companies.

Company B's business focuses on construction and related services and software. The construction business includes everything from business premises to housing and pipe renovations. The company has gotten outside funding for their innovation activities and is focusing heavily on developing their innovation activities in the upcoming years. Company B is a PBO like companies in construction industry in general. They have got three business areas they are focusing on: construction, services, and smart solutions. Along with the innovation funding, company B established a new CIO role and new strategy and processes for innovation activities. The company wants to be seen as a visionary in the very conservative construction business.

Both of the companies have grown and are still growing and hiring new talents in a fast pace. Both have also developed innovative solutions in past years and want to continue that also in the future. Company A focuses mainly on developing their core software product, but Company B wants to move more to service and software business that is related to construction industry and become a leader in that kind of services.

3.3 Data Collection

The empirical data was collected through interviews. Purposive sampling was used when choosing the interviewees. It enables the researcher to select informants that best enable in answering the research questions and to meet the objectives. It is used especially in case studies and when particularly informative interviewees want to be selected (Saunders et al., 2009, p. 237) and therefore is well suited for this research. The interview had an informal start where some background about the research and the researcher was told and also the interviewee got to ask questions about the research area and methods. The aim was to give the interviewee an idea about the themes of the interview and the interviewer a possibility to get some information of the interviewees background and knowledge around the research area.

After the informal beginning, the interview outline was developed. The base of the questionnaire was given by the UTS researcher who had already conducted some interviews using the form. The questionnaire was improved together with the supervisor of this thesis and it did not need further improvements during the interview process.

The data collection started in Company B after the contact person in that company had provided a list of potential interviewees and a suitable time for the interviews had been found with each participant. One interviewee was also contacted based on a recommendation of another interviewee. The interviews were semi-structured. All the interviews apart from one were done face-to-face, one was conducted by phone.

In company A, the interview process was similar compared to the first one. Semi-structured interviews were conducted, one by phone and the others face-to-face. The interviewees' information was given by a contact person. No modifications to the questionnaire were needed, only some questions in some interviews were left out because they were irrelevant in that case.

The interviewees were mainly manager level people, but also some lower level personnel participated since people from different project, portfolio and program levels was the aspiration. The interviews were conducted between April and June 2018. The interviews lasted from 26 minutes to 93 minutes. The average duration of an interview was 62 minutes. Time reserved for one interview was between 1-1,5 hours, depending on the schedule of the interviewee. Some of the interviews were also shorter than the reserved time, mainly depending on the interviewee's knowledge on the topics and also some schedule issues. Table 3.2 offers a better view on the interviewees.

Table 3.2 The roles of the interviewees in the case companies

Interviewee	Duration (min)
Development engineer	90
Business development team lead	93
Chief Technology Officer	49
Innovation Expert	50
Business Developer	79
Chief Innovation Officer	26
Group Product Manager	75
Vice President of Research and Development	45
Deputy CTO	53
Team Lead / Scrum Master	59

Even though there was a beforehand prepared structured questionnaire, the questions were discussed in a flexible order with the interviewees. The order was flexibly changed based on how the conversation proceeded and the questionnaire was used to support the discussion. The interviews were recorded and afterwards transcribed. The researcher also wrote notes and transformed those to electrical notes.

3.4   Data Analysis

The material that was gathered in the interviews was sufficient to be able to make further analysis and conclusions. Since there was no specific theory the research was based on, induction was used as the research approach. In induction, the theory follows the data and is well suited for a qualitative research that tries to describe a new phenomenon and gain knowledge from different perspectives (Saunders et al., 2009, p. 216).

The data analysis was conducted in several steps. An external service provider transcribed the recorded interviews. The researcher checked and made needed corrections to the transcriptions in case of mistakes or gaps. After that the data was categorized following the structure and themes of the interviews. MS Excel was used as a tool in the categorization since it was suitable regarding the amount of the research material.

The material was categorized to five categories: innovation environment and strategy, innovation governance and processes, actors and roles, innovation governance at different levels of project organization, and current challenges. These categories were formed based on the interview structure, the research questions, but also the observations done during the interviews. These observations included topics that the interviewer thought were repeated and highlighted in several interviews. A cross-case analysis was done to compare the results between the two case companies. Similarities and differences were tried to find and present.

The results are presented in the following chapter along with quotations from the interviews. The clarifications that are added to some quotations are put inside [square brackets] and possible deletions or cuts are marked with "…". The quotations have been translated from Finnish into English without changing the content. Some unnecessary words have been deleted to simplify the quotation but without changing the message. It is not possible to recognize the interviewee from the quotations. The results were sent to the case companies to proof the content and minimize misunderstandings.

4. RESEARCH RESULTS

4.1 Case Company A

4.1.1 Innovation Environment and Strategy

In case company A, innovation is very strongly attached to the core product offering and its development. All the interviewees talked to some extent about the R&D process and IPR (= intellectual property rights) and patent processes when defining innovation in their company. One interviewee mentioned also process innovations but said that it is not something they are doing or have focused on. They see that the core product is the main driver for added value for the clients and also the differentiator compared to competitors' offerings.

The company does not have a specific innovation strategy, innovations are guided through product strategy. The company has an IPR and patent strategy related to innovations, but not guiding the creation of new innovations. The patent strategy mainly means that inventions and new product features are evaluated to realize a potential patent possibility, so it is not innovation driven per se. All the interviewees saw the importance of new patents for the company's competitiveness and brand value on the market. The core product is developed based on the product strategy and innovations might rise from the development process but none of the interviewees thought that the product development is innovation driven even though innovations were seen important for the product and the company. A manager tells:

> "From the R&D and product perspective [the reason for patenting] is the protection of intellectual property… Mostly the protection but also our credibility in the market. A technology company should have patents. Maybe the credibility has been the main reason so far. Not so much making money with the patents."

The interviewees think that their company and the business they are in is dynamic and that the company can react quickly to new phenomena and ideas if those are seen promising and thought to create value. On the other hand, two interviewees saw that there needs to be a balance between the ongoing product development and new ideas or requirements. They see that new things are tried, and innovation possibilities are given a chance and it is part of the development process. Two managers explain:

> "So, the dynamism is shown for example as our agility, that we can change our direction quite fast. I would say that for innovation projects and new ideas it is good that we can very quickly reallocate resources and decide that this is the thing we are focusing on now."

"I would say that the industry is nowadays very dynamic… All the time there are new technologies coming that we should study and even so much that one does not even have time to read all of that and then it is possible that we miss some very good technology. If we don't have even time to orientate and find out that with this, we could do this and that thing that we have been trying to figure out for months. It is not worth re-inventing the wheel. Yes, it is very dynamic."

Part of the innovation environment of company A is that they have established a so-called innovation afternoon, where every second week one afternoon is a free time where development team members can try new ideas and use their time to innovate. An invention hunt is also organized at times to find inventions that could be patented. These innovation activities are done in the R&D unit.

From the interviewees' point of view, company A is either average or above average on innovativeness compared to their competitors. They have released advanced products and features and exploited the latest technological innovations related to artificial intelligence and data analytics. Company A has many partners and key user groups that give them ideas on how to improve their product. Those ideas can sometimes evolve into innovations. Open innovation is not deliberately done. Usually co-operation with partners or possible future partners is based on practical needs, not primarily on innovation.

4.1.2 Innovation Governance and Processes

Company A's innovation activities are mainly focused on their core product and the agile product development process along with some innovation provoking activities and a patenting process. Many of the innovations are put into a patenting process and the company has a patent panel where it is decided if a patent process for e.g. a new product feature is started. Goals for number of patents per year are set to each unit by the top management.

Some of these ideas are taken from an idea gathering tool where anyone working in the company can input ideas regarding product development. Many of the ideas that are put into the database are minor improvements but there can as well be potential innovation ideas. According to one of the product managers, around ten ideas per day are inserted into the tool. A lot of ideas and initiatives also come straight from the CTO and company founder. The product management prioritizes the initiatives taken from the idea tool along with other requests from for example the company leadership. An interviewee tells about the ideas put into the idea gathering tool:

" Those come actually a lot and we encourage to write down the ideas to the system. Some of those come straight from the clients so that the clients ask for specific functionalities and our people working in the customer interface record those requests. But very much come from inside the house since we use the software ourselves also and get ideas about what could be nice… And then it is kind of the

product manager's responsibility to dig those and take some small improvements and some bigger improvement to the roadmap. And of course, we face the challenge that there is the product strategy we should follow, then there are straight client requests and then we have the minor improvements that are put in the idea tool and then there can be steering from executive team or leadership and all this has to be balanced on the roadmap."

Innovation process in company A is not separate from the generally used agile development process that includes innovative and other development work as well as minor and major development entities. The innovation process has not been changed recently. The changes in the company are related to their growth and they established a program manager role recently to respond to the higher amount of governance and management that is needed. The role includes coordinating things between the product development and the product management.

Product management makes the development prioritization decisions and is therefore affecting the innovation related decisions. The development work is done using agile methods. They use scrum which means that the work is divided into two-week sprints, with sprint planning before the sprint and sprint review after the sprint. These together with definition of done (DoD) decisions are the major decision points for the projects. In sprint planning it is decided which user stories are taken into development and the development team together with product owner from product management are doing the prioritization decision. In sprint review the work done is reviewed and checked if everything that was planned got done and whether there were difficulties. Definition of done is a step taken when a certain user story or a feature that includes several user stories is finished and ready to be released to production environment.

After every sprint an innovation afternoon takes place. In practice it means that the development unit members have the possibility to try new ideas and build small prototypes or demos to test those ideas. Sometimes innovations might emerge from these experiments. According to one interviewee critical and urgent development tasks sometimes takes time from innovation afternoons so not all the employees utilize this opportunity every time if they feel that there are more pressing matters that need their attention. Innovation afternoons were thought as a good thing according to the interviewees, but many of them thought that it is also hard to focus on innovating at a specific time, especially if there is pressure to get other things ready at the same time, which is often the case in software development. Free time and relaxed environment is needed for innovations to spark according to one interviewee. As the interviewee tells:

"At times you've got other pressures and if you happen to be anywhere near the customer interface the idea of doing your own things for one afternoon does not feel so good. So, at times you skip it and I have heard that others do it too. But there are also groups that hold on to the chance to use that time… I don't see that

> *obliging people to participate would be a good thing if one gets stressed about leaving their normal tasks that they should finish by the weekend and now you won't."*

The company has 'invention hunting' days approximately once a year. Participants are the people from whom the ideas are wanted, even the whole R&D department. There the participants can freely throw ideas and also go through of what has been done and what is currently in the development process and could some of those features be original enough to be patented. There is a temporary panel that goes through the suggestions and decides if some of those should be taken to the patent process. It has partly the same idea as the innovation afternoons but in a bigger scale.

Innovation in company A is seen strongly through patenting so the innovation processes are also linked to patenting processes and rules that apply to that. There are basically two processes linked to innovations in company A, the development process and the patent process. Then there is the phase before and during development where ideas are gathered from different sources and prioritized together with other new features. The R&D manager tells about the new process for innovations and development work:

> *"The process is changing now all the time and right now we are in a phase where we start to look at [the innovation] through features instead of project or program milestones. The reason for this is that our release cycle will be so fast that we don't even have more than a couple of project milestones. We don't have time for patent checks or invention hunting events. So, in the future we are doing patent evaluation together with product concepting… We will apply the inventions policy so that we try to incubate and get people to think about invention reports. If we get those, they will go to the standard process where the patent board looks them through and decides if we are applying patents for them or not."*

The patenting process itself is outsourced to an agency that runs the process after the decision and application has been done. The inventors get rewarded for the patent filing and the actual granted patent.

Company A does not have a dedicated budget only for innovation, except for the innovation afternoons. That creates balancing decisions when the R&D budget is being set since the budget is used both for continuous development and enhancements of their products as well as for the development of totally new features and innovations. Last year when the company released a big innovation to their product a big amount of the resources was tied to the development of that new product feature since that was in the strategic focus and priority number one. At other times, the resources can be divided so that small improvements are done more and there are no one big innovation initiative going on.

Previously in R&D unit there was for a short period of time a small team whose purpose was to try ideas and concepts and to see how those would fit to the existing product offering. One of those ideas led to a new and important feature that has been now released. That idea was ramped up from a concept to an important feature and the team basically focused on developing that one idea. Today that team does not exist in the form that it was originally since their expertise in that one area they had been testing and working on wanted to be leveraged in the development. It is possible that in the future same kind of team would be established again.

Sometimes priorities in a program change and that can cause putting some features on hold for a while so that it can be done in the future. It is also possible that later that certain feature is not done at all if it is not relevant anymore. Usually strategic changes can cause terminating the development of a feature.

4.1.3 Actors and Roles

In company A there is no single innovation leader rather the decision-making power is shared with the CTO and R&D manager. On a daily level, the product managers are the ones making decisions about the content of one product release in their responsibility area. The R&D manager is responsible especially for patenting related decisions and process. The CTO's role is to be responsible of finding and deciding about the use of new technologies and overall the technology choices in the product. The patent board consists of the CTO and the R&D manager.

All the feature prioritization work is done by the product managers. Their task is to facilitate the conversation and create the best vision of what will be done and put to the roadmap. Sometimes there are big innovation initiatives that are prioritized and lead from the top management level like the one the company released last year.

On project level the work is done in two-week sprints that are planned together with the development team, team lead and product owner who is from product management. From development team's perspective the innovation development decisions are done by the product manager. On the other hand, they feel that it is easy to bring up their innovation ideas even to the CTO.

In company A the organization structure regarding innovations and R&D is very flat and basically all the decision-makers are working in the same location. This makes having conversations and communicating decisions easy. The different responsibilities and authorities are well recognized. Like one manager tells:

> " You could say that, it is anyway really natural since we have almost all the product development in the same place. We work together actively and participate in

the same meetings every week, so we can bring up concerns in the meetings or on the hallway or where ever. So, in that sense the communication works really well."

4.1.4 Innovation Governance at Different Levels of Project Organization

Company A has a rather flat organization structure which is why they do not think that a specific structure for linking different project levels is needed. When asked about these links, many interviewees said that they have not thought about these kinds of links since communication between different decision-makers and teams works well and is fluent. The hierarchy is very low, and the leadership is close to innovation related decisions. The same people are involved in the portfolio and project level which makes the communication easy all the way to a single development team. All the people making these decisions are also located in the same place and from one interviewee's point of view that is also why it is easy to have discussions, and everyone knows what is going on. One manager describes the linking:

> *" Well it is the responsibility of the whole product management. We have the product strategy and then we have the corporate strategy. So, the product strategy has to mirror the corporate strategy and then from the product strategy the clear tasks are derived. So, the idea when we are developing a single feature is to be able to link it upwards and so that is quite a nice thought."*

Even though linking the decision-making levels is working, the strategy and day-to-day work could be linked better. At the moment, a middle layer linking strategy with a single task or a user story is missing. The middle layer would help in prioritization decisions to see, what is more important with regards to strategy. Now the strategy is too general to help in that kind of prioritization and the connection is hard to make. A part of this linking is better communication of the strategy from the leadership to the team level. The same manager continues:

> *"So maybe it is just that we are missing the middle layer, we just haven't been able to carry that out. If we have the corporate and product strategy that is too generic in a way, so we should be able to split that into strategic initiatives so that we could see that this is what we want to do and then those initiatives could be split into epics and user stories. The jump from an epic or a user story to the product strategy is too high and makes it possible to link almost anything that is wanted to the strategy level."*

That clearly defined middle layer would make also the product managers' prioritization work easier. Also, communication is easier when things are not in a very abstract level. A single team member can be hard to incorporate their day-to-day work to the strategy

level. It is easier to communicate and get people committed when the prioritization decisions can be linked to clearly defined goals and initiatives. That makes also easier to justify why something is left out of the scope.

4.1.5 Current Challenges

Company A can be seen as a very innovative company with regards to their product offering but they also have challenges and things that could be done better. Innovation afternoons are a good thing, but one cannot assume that innovation is created in pressure and at a certain time. Not all the development team members were able to use this dedicated time every two weeks because they had more important things to work on at the same time. According to one interviewee there are no barriers for innovation and innovating. The challenge is that there is almost always a deadline coming soon and then many people just skip the innovation afternoon. More encouraging and steering is needed to use the innovation afternoons more productively. Some concrete guidance is wanted, not just a time slot that could or should be used for innovating.

> *"At the moment there is no concrete guidance. The innovation afternoon is a good thing, but it is anyway kind of "here's some time for you, use it". It doesn't include guidance or steering. In the history at least when you are in a hurry you are not innovating, you are not thinking that this would become a great thing, you just try to get things to work."*

The ideation phase (fuzzy front-end) of innovation is a challenge according to one of the interviewees. When the idea has been accepted to the roadmap, the processes are clear. One thing mentioned was that the follow-up of one's idea could be improved. Basically, the idea originator may get information only when the idea has been implemented and before that it could be on the backlog for a year.

Strategy and day-to-day work is not very clearly linked. Therefore, it is sometimes hard to justify prioritization decisions if all the ideas and features can be linked to strategy. Many of the ideas that are written in the idea tool are not linked to the strategy clearly. Those should be linked better to bigger contexts. Like a manager says:

> *"Then those could become significant. If for the same area there are for example five different ideas how that could be developed, and some of those could be very good things. Separately those might not end up to anything but in a bigger entity that could be significant... Handling such a large amount of bottom-up innovations is really demanding."*

There is also the balancing between on-going development work and creating new innovations which is a constant struggle and the company does not have a clear way to deal with that. According to one interviewee:

> *" Let's say there are counterforces, so it is kind of good that others tear you to one direction and other to the other. So maybe that way a balance is found in what we are doing."*

Many things are done very well in company A and there is always something that could be done better. A manager sums up well the situation:

> *" Maybe the things that work well are the atmosphere and process and the encouragement for innovation, so the framework is good. What created challenges at times are the resource constraints and schedule pressures or goals to finish certain tasks. That requires a tight focus on developing the features so there is not necessarily always the time for innovating even though you had a good idea. It is not possible to start progressing that in the patent process. But we have been able to do those along the way, so I think that is a sign that in practice it anyway works."*

4.2 Case Company B

4.2.1 Innovation Environment and Strategy

Innovation at the moment is defined as products and services that create scalable business. Innovation is seen broadly including products, new processes and new business models. Not all the interviewees were sure how innovation is defined in the company and thought that the definition will get clearer when their new innovation processes have evolved and are being fully used.

Innovation strategy is closely linked to the corporate strategy and it is being defined with the help of DARPA Playbook for Strategic Insight & Innovation which is a guide created for modeling, designing, and leading radical corporate innovations (Carleton et al., 2013). Company B wants to use innovation to create new service and IT related businesses next to its traditional construction business.

All the interviewees feel that the company is more innovative than its construction business competitors in Finland but far away from companies in IT or other dynamic and innovative businesses that could be their future competitors. Company B has a very dynamic and enthusiast innovation environment, some say that it is even too dynamic which means that they jump from one thing to another without finishing the first one. One manager points out that sometimes agility and ad hoc are confused with each other meaning that the processes should be agile but in reality, things are done with a very ad hoc style, which causes inefficiency and the lack of perseverance. Two interviewees tell:

> *" When we are looking at agile way of doing I see it as a very disciplined process and then… ad hoc is a totally different thing and now the dynamism in my opinion is something that should be disciplined dynamism but then the thing that we are*

agile and we are dynamic is easily understood wrong so that agility means doing one thing today and another thing tomorrow and the target and goal is missing."

" In a certain way a kind of hierarchy and these kinds of structures may foster the forwarding of codified information in a different way. In our company, the dynamism appears in highlighting the people-to-people communication. And again, there are different colors, so in a way extremely dynamic and dynamic and productive people, but then the other side of the coin is that the dynamism and the lack of codified process and knowledge can lead to inefficiency."

On the other hand, the company has a low hierarchy and people are free to try new things and roles that interest them. Many of the interviewees think that the company has a fail fast mentality meaning that if some project does not seem to be profitable they can easily terminate it.

The Chief Innovation Officer (CIO) defines innovation by using a 2x2 matrix where different innovations are divided based on how well the problem that needs a solution is defined and is the solution industry, i.e. construction, software, chemistry, known or not known. The framework is not used widely in the company yet, but it has been created to help defining and separating different kinds of innovation activities and create understanding of why there are several ways how innovation is approached.

	Problem clearly defined	Problem not clearly defined
Solution industry not known	Breakthrough	Systemic
Solution industry known	Incremental	Disruptive

Figure 4.1 Company B innovation matrix

Some interviewees told that innovation in company B is divided into run and bend businesses that are similar to radical and incremental innovations. Run business includes continuous development and bend business aims to the creation of innovations. Those are not systematically balanced but that might be done with a gut feeling.

Company B is doing open innovation in many forms. They know what the future challenges are and what is in their strategy, but they do not have the correct solutions or implementers for those problems which is why outsiders are needed. They have a start-up program where they try to find common business opportunities with start-ups or potential start-ups. That can be basically any kind of co-operation and innovations. Usually in these

kinds of initiatives company B is the main owner of the start-up and the others are given a smaller share. The leadership also travels a lot and discusses with start-ups, investors and other construction companies around the world to get insights on what is happening in the future. One interviewee thinks that the top management can get excited about many kinds of start-ups, but those are not always linked to the strategy and a definition for the co-operation and open innovation could be good. As the interviewee explains:

> *"I would say that we are missing a definition of what kind of innovations we want to achieve with others, how we want to do that and what information we want to share. Are we going for a joint venture or do we just want to learn something from them? These things haven't been defined."*

Company B also participates in start-up events like Slush to find potential partners. Company B is developing an open data platform where partners and other companies can put their ideas. A little like the start-up program are future Fridays where some external organization, e.g. a start-up, comes for a visit to tell about their initiatives that could help some internal development teams in their problems. In general, the attitude towards open innovation is very good since change is understood as a vital part of the organization's development. The main challenge is to convince the leadership and get their support for new initiatives if those are not coming from their direction. Like one interviewee says:

> *" It is quite human that many people need to be able to leave their own fingerprint in the thought so that they can be okay with it. Because we have anyway quite strong personalities working here so they have to be committed and consulted about that [innovation idea] before it can progress."*

Not all the interviewees think that there is any kind of resistance or not-invented-here thinking in the company. Like another interviewee tells:

> *" I have not noticed at all since we are really... it is so in the genes, innovations and that stuff that we search for the solutions, so I haven't noticed [any resistance]."*

There is no clear and linear rewarding system for innovations, but the innovation environment is positive, and people are encouraged to innovate and given credit for good ideas and accomplishments for example in pre-Christmas parties. According to one manager, also monetary rewards can be given.

4.2.2 Innovation Governance and Processes

Company B has a dedicated budget for innovation. They have got a two-year loan from Business Finland which is used in total to develop new innovations. More specifically the budget scope is to develop scalable business. There is some ambiguity on what is strategic development and what is not, so not all the innovations are necessarily included in the

scope and those have to fight the budget with operations budget. Before the loan was granted, the innovation resources fought with the operational resources.

Now that the company has a clear monetary budget for innovating that is much bigger than they have historically had the bigger problem is the human resourcing. For new kinds of software related development consultants can be hired but internal resources are harder to allocate. The lack of internal resources cannot be covered by consultants.

The budget decisions are done by the 3x3 group and the budget for every project is allocated in every quarter. The projects have to prove that they deserve funding in the next quarter and if it seems that some project is not progressing and should be terminated, the quarterly budget re-allocation is a good place to do that kind of decisions.

According to some of the interviewees, the projects need more steering and guidance and the decision-maker roles should be made more visible. According to one interviewee the communication is an issue sometimes. It is not always clear why some projects are terminated and some continued. In many cases the reason a project was not progressing and was terminated, was the lack of guidance. Sometimes leadership takes too much role in deciding about small details that the project owner could do. An interviewee describes the project managers' situation:

> "The project managers have been quite confused in here when they get a request to do one thing and then they get a different request to do something else and that lowers the project manager's motivation because they don't know who to listen to and what is the most important thing at the moment."

The innovation governance processes include project-specific sprint reviews, portfolio reviews, and group meetings. The company has also orientation days for the leadership, for different business units and for the whole organization. Those are events where the strategy is created and reviewed through workshops and discussions.

If strategy is not communicated to all the levels of the organization, some good ideas might be left in the dark since people cannot contribute and do not see why they should bring up their ideas. Not all stakeholders, like end customers or subcontractors even know that company B has innovation activities and that they could bring up problems and improvement ideas and would have a chance to make a difference.

> " The problem arises initially from the fact that innovation activities have to serve our strategy. How well the strategy is defined and understood around the organization, surely not well enough which leads to people not being able to contribute and engage into it even though they would have very essential things and initiatives, they don't because they don't understand it, so they don't even bring it up even inside the company. So, when we include our environment, with the open data platform we try

to focus primarily on fostering the digitalization, so our customers are on one hand the software suppliers, technology suppliers but then also the end users like subcontractors, our own construction site personnel, material suppliers, logistics planners, supervisors, end customers like the pipe repair associates and so on. Most of these stakeholders don't even know about our innovation activities so that they could bring up issues and problems they are facing and that would be valuable information for us since now we are only guessing what kind of trouble we cause for subcontractors and what are the real problems that the customer has."

The fuzzy front-end of innovation is seen lacking a structure and connection to the innovation strategy. Some ideas are defined into concepts and developed without thinking the customer potential. As one interviewee says:

"There are, in my point of view, important parts missing from the front-end and somehow it is thought that okay we create a product and we sell that and everyone wants to buy it of course."

In innovation activities, a process from the Playbook is used. The process is iterative and has three steps: discovery → go to market → scale. Discovery phase includes design thinking and creating a good concept. Go to market is more about the end phase and how the new product or service is sold to the clients. Scale includes continuous development or extending the business to new areas. When the project has been established, there are portfolio and sprint reviews and the work is done in design sprints. This is a new process and none of the projects were in the scale phase yet. There have been projects where after discovery phase the project has been divided into two different projects where the other one was put back to discovery and the other one went to go-to-market phase where it can be piloted. According to one interviewee this process is used, and it is good, but it cannot be thought as a solution to every problem and situation.
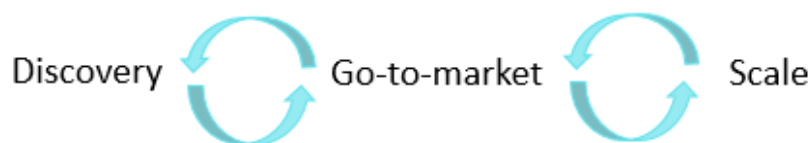
Figure 4.2 *Innovation process used in company B*

The innovation process is evolving and now many of the initiatives have come straight from the business unit CEOs when there has not been the first evaluation of the idea, rather a readymade decision to start a project. Everyone can tell their ideas and are encouraged to do so, but there is no place where those are gathered. If the person's superior is not that interested or excited about the idea, it is possible that nothing happens.

Before there were more than hundred different development projects at the same time but now the amount is reduced to around ten since there is now a focus and a clear strategy on what the company wants to focus on in the next few years. Some projects have had to stop because there has not been enough knowledge or resources needed. Some projects have been terminated because the project team has not got results. On the other hand, some teams felt that there was a lack of steering and guidance and that there were contradictory decisions from different sources. If that had not been the case, the projects could have continued.

Without structure there will be many ideas but those are not necessarily linked to the corporate strategy. With clear strategy linking and processes, decisions are easier to justify, and ideas get to be developed instead of just being tossed around. The new processes and structures that are linked to the Playbook are seen as a good thing among the interviewees:

> *"In my opinion having a structure and methodology helps in a way, because to be able to innovate, one has to be systematic and disciplined in certain things. Usually everyone likes to innovate but the thing is that something concrete has to get through the process and when we get something to the market we get knowledge. There has to be rules and such. Some people certainly think that these kinds of things restrict free innovating… If we would develop without a structure, we would be doing everything that is possible without any synergies [to strategy]."*

4.2.3 Actors and Roles

The main responsibility for innovations in company B is divided between the CIO and the CTO. The CIO is a role that has been established in the company in less than a year ago and the CIO's responsibility is currently mainly in establishing the new innovation processes and vision and it is done by using the Playbook as a tool. The CTO's responsibilities are more on the content and operational side of innovation activities. The top management in company B gives a lot of strategic guidance and is responsible for creating the circumstances where innovating is possible.

According to one manager, the top management's role changes during time and depending on the maturity of the company's innovation activities. First it is the starter of the innovation function, then you become the enabler that has to make sure there are enough resources and finally when the innovation function is running smoothly the task is to steer the activities into the right direction. Top management also has a lot to say in which projects are executed and they are also a source of many innovation ideas and projects.

On the project portfolio level, the decisions are made in the so called 3x3 group. The name relates to a 3x3 matrix that includes the company's different vision and time horizons. There are the things that are done now as well as the visions that go to the year 2020 and beyond. The 3x3 has been now reduced to a 2x2 group (construction business, intelligent business, performance management, innovation management) to make it simpler. Basically, it includes the executive team and consists of the CEOs of three business units, the CIO, the CTO, the CFO and the HR director. They have a very good knowledge on everything that is on the portfolio and they make the important prioritization decisions. On a project level the decision-making is done by the project steering group.
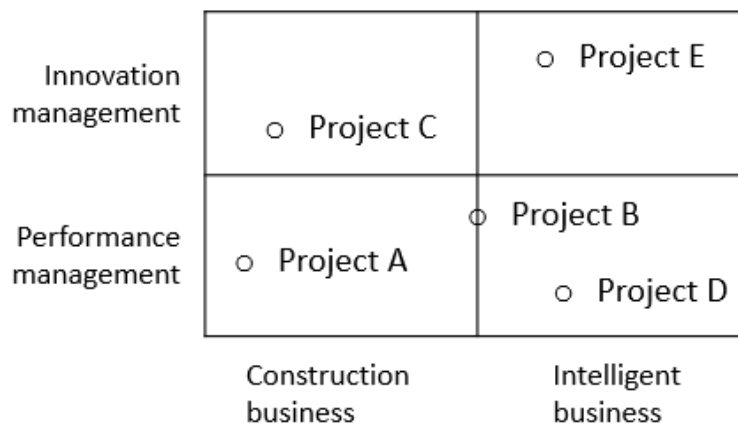
Figure 4.3 *The 2x2 portfolio grouping*

As already told, in company A the decision-making is highly connected to personal relationships and people-to-people communication, often unofficial. This can make the decision-making seem hazy and even unfair. Including all the relevant stakeholders to the discussions is not always obvious. As one interviewee tells:

> *" SMEs [subject matter experts] are not included enough. We don't have good enough ways to link them to the decision-making process. So, then we have a kind of HIPPO syndrome (highest paid person's opinion) and the top management voice is the one deciding. We should include the SMEs and their perspectives better because they are often in the field and not in the development steering groups or portfolio reviews or others. We should have better mechanisms to include their knowledge and point of views."*

4.2.4 Innovation Governance at Different Levels of Project Organization

Linking different project levels in company B is not straight forward. The program and portfolio level linking are quite clear, the problem is in project and portfolio linking. Part

of the problem is the used 3x3 (or 2x2) group decision-making model. One project can be part of more than one block in the 3x3 and then it is harder to define the roles and responsibilities. Top management knows the dependencies but on the lower levels those are harder to communicate which is why there can be confusion. The program and port-folio level are thought to be linked well since the program managers participate to port-folio steering group.

> *"In some project you could do both digitalization and internationalization and then you don't know who is steering that… The Playbook should solve this situa-tion a little better. We have a sketch on that but … people don't understand the dependencies and of course in the company's top management those are under-stood and have to be understood since those are worked with every day. But when you have to communicate that to the whole organization you can't assume that people would understand that."*

The top management is very devoted to the new strategy and innovation process but com-municating that to the lower levels can be hard. For someone working on a construction site it can be hard to see how the strategy and vision is linked to the daily work. The new process is still evolving so it is understandable that the leadership does not even want to tell about it before it can be defined as simply as possible.

There is unclarity on who is responsible of linking the different project levels. Some think it is the CIO's task, some say it is the CTO's and COO's responsibility. There is confusion about the authorities and roles, but also here the process is evolving and since the CIO has been in the company only for a short while that role is still unknown for many people in the organization.

4.2.5 Current Challenges

The main challenges in company B are related to unclear innovation project structures and processes. They are now doing a major transformation and have established both the role of CIO and related to that new innovation strategy and processes that are still being developed and improved. All the interviewees thought that the new structures are needed to make innovation activities more effective and visible. Part of the reason why there has not been such clear processes is that company B's personnel has been recently growing fast. Before the need for these kinds of structures was not necessarily obvious.

When asked about the person responsible for innovations in company B, the interviewees' answers were not consistent. Some said that it is the CIO, some the CTO and some thought that the role is divided between those two. That might be partly because the CIO role is a new one in the organization and many people still thought the CTO is in charge of innovation on the practical side. The roles are evolving, and it might take some time before everyone has the same understanding on who is responsible of what regarding

innovation. Some interviewees told that there had been some leadership issues in the house but those have been tried to solve.

One clear problem is that the communication and decision-making in many cases is oral and things are not written down. That can create confusion since the background of the decision is not necessarily known and then people may feel that things are decided and changed without an obvious reason. It is also important to know the right people and the unwritten rules if one wants to get their idea through to the correct decision-makers. According to one interviewee this is not the best and fairest way:

> *"If you are new to the organization, you can't possibly know how these things go and, in my opinion, it should be possible for anyone to get attention for their idea. That could be then be processes and see if the idea is a good one or not and connect the idea's originator to others that could help and see if they should establish a team and create a concept or something. We don't have room for that because everything is discussed orally; what is done and when is it done. Then we create the situation when if one doesn't, at a right moment, remember, can or have the right attitude, it affects too much on what is done."*

Strategy needs to be communicated so that everyone working in the company will understand it and its link to innovation activities and what they are doing in their daily work. From a construction worker's perspective, it might be unclear why innovations are done and what is the purpose of the different vision horizons and innovation projects. As one interviewee clarifies:

> *" Maybe the intermediate layer is lacking. We have a great vision and then the concrete daily work in a project and there is no understanding of how the daily work affects the vision and vice versa."*

Supposedly the new innovation Playbook should solve some of these challenges. The base for innovating is there and all the interviewees thought that the company and its people have a very good attitude towards innovation and they have got all the preconditions for success covered.

4.3 Cross-case Analysis

4.3.1 Innovation Environment and Strategy

The two case companies are very different and operate in different industries. Still, they both operate in a project environment and are similar sized. In the innovation context there can also be found similarities. The results that were covered in the previous chapters are compared in the tables below.

Table 4.1 Comparison of innovation environment and strategy in the case companies

	Company A	*Company B*
Similarities	• Innovations seen as an essential part of product development and company strategy • More innovative than traditional competitors • Dynamic environment, ability to react to changes and new technology possibilities • Innovations and patents important for the company image and brand	• A lot of enthusiasm towards innovation • Want to be seen as visionary • More innovative than traditional competitors • Dynamic environment, ability to react to new ideas fast • Innovations important for the company image and brand
Differences	• Innovation scope in product development and patents • Innovation is a part of the product development process • Open innovation not deliberately pursued • Rewarding system linked to patent process	• Innovation scope in creating new scalable business • Innovation is separate from the core construction business • Open innovation done in various ways • No standard rewarding system for innovations

Both case companies are very innovation minded and think that innovations are an essential part of their strategy and value creation. In both companies it is thought that innovations make the company to stand out from the competitors and that it is seen as visionary in their field. The companies are dynamic and reaction to new things is quick if necessary and the course can be changed, and new projects started without too many questions or hesitation.

The two case companies' innovation scope differs. Company A includes innovation to their product development, especially to their core product and they see innovations mainly through patents. Company B sees innovation at the moment as anything that helps to create scalable business. That can include anything from product and service innovations to new business models. Company B does not have a standard rewarding system for innovations even though individuals are rewarded at times. In company A rewards can be gained through patenting.

4.3.2 Innovation Governance and Processes

In company A the innovation activities are not clearly separated from other product development. Rather, sometimes there are more innovation related development and at other times there are more minor enhancements and other development tasks. In company B the innovation projects are separated from the operative side and day-to-day construction site work. The companies differ also in the way they pursue open innovation. In company A, there is cooperation with partners and clients, but innovation is not the main reason for that. Company B arranges different open innovation related activities where new ideas are tried to be created e.g. together with start-ups.

Table 4.2 Comparison of innovation governance and processes in the case companies

	Company A	*Company B*
Similarities	• Agile methodology used in product development	• Agile methodologies used in innovation projects
Differences	• Tool for new ideas that everyone in the company has access to • Innovation afternoons and invention hunting days for idea generation and testing • Patenting process outsourced to a patenting agency • No separate innovation budget	• No tool for idea gathering yet (coming in near future) • New innovation processes and structures established and still evolving • Innovations divided to run and bend, also new classification established by the CIO • A dedicated budget for innovation activities for the next two years

Both case companies use agile methodologies in innovation projects and product development. Company B has also got a tailored process for different steps of the innovation project. The project milestones are linked to the steps in agile methods in both the companies.

4.3.3 Actors and Roles

The case companies have got very different ways to gather innovation ideas and the processes and governance of the innovation projects differ. In company A, there is a tool for idea gathering and activities where ideas can be generated and tested. There is also a clear patenting process both inside and outside the company that is followed. The budget is not

divided between innovation and other development work. In company B, the innovation idea gathering is more random and people dependent, their processes are still new and are being developed and tested still. They have got a dedicated budget for innovation and a classification for different kinds of innovations.

Table 4.3 Comparison of actors and roles in the case companies

		Company A	Company B
Similari-ties		• Innovation leadership shared with the CTO and the chief of R&D	• Innovation leadership shared with the CIO and the CTO
Differ-ences		• Innovation related decision-making and roles are clear in the organization	• Innovation related decision-making and roles are not clear in the organization

Innovation leadership is shared in both case companies between two people. This has not necessarily been a conscious choice. The innovation related decision-making may have just naturally fallen for those roles, except for the Chief Innovation Officer which is a specific role dedicated for innovation management. In company B this shared leadership between the CIO and the CTO is a recent thing and these roles and their responsibilities are still evolving. In both cases the other role includes more innovation process related decisions and the other is more included in the innovation content.

In company A the roles and responsibilities of different decision-makers are clear and there is no confusion related to that. In company B, on the contrary, the roles are a bit unclear to some people and it is not always obvious who is the one making decisions in innovation project related matters and who should be listened to. These roles along with the processes are evolving though.

4.3.4 Innovation Governance at Different Levels of Project Organization

The case companies have a rather flat organization structure which makes it easy to take initiatives to the executive team and get decisions made without too much bureaucracy. The leadership in both companies also participates in the innovation related decision-making. The innovation strategy can be hard to link to everyday work and that has been noticed also in the case companies. Dividing the strategy into smaller initiatives and entities that can be linked to single projects or features could make it easier for the employees to understand how the strategy affects their daily work.

Table 4.4 Comparison of innovation governance at different levels of project organization in the case companies

		Company A	*Company B*
Similarities		• Rather flat organization structure • Company leadership is close to innovation related decision-making • Linking strategy with day-to-day work is a challenge	• Rather flat organization structure • Company leadership is close to innovation related decision-making • Linking strategy with day-to-day work is a challenge
Differences		• Linking different levels happens automatically / is not thought because of the flat organization structure	• Linking different project levels is not straight forward • Unclarity of who is responsible of linking the different project levels.

The case companies have a rather flat organization structure which makes it easy to take initiatives to the executive team and get decisions made without too much bureaucracy. The leadership in both companies also participates in the innovation related decision-making. The innovation strategy can be hard to link to everyday work and that has been noticed also in the case companies. Dividing the strategy into smaller initiatives and entities that can be linked to single projects or features could make it easier for the employees to understand how the strategy affects their daily work.

In company A the linking of different project levels is not thought, and it happens automatically because of the flat organization where everyone is in contact frequently with each other and knows who is responsible of what. All the people making decisions about innovations have meetings frequently and they see each other almost every day at the office so both official and unofficial discussions happen all the time and everyone knows what is going on all the time. In company B the linking is not so straight forward and there is unclarity about the responsibilities. This might be part of the fact that their processes have been and still are changing. If this is not clarified in the future, the roles and responsibilities will remain unclear also in the future which harms the decision-making and efficiency of the projects.

4.3.5 Current Challenges

In both companies the idea generation and the so-called fuzzy front-end of innovation could be more effective and focused i.e. linked also more specifically to the strategy. On the other hand, strategies change all the time and sometimes successful innovations may spark from something that is totally unrelated to the company strategy and thus change the strategy. As told before, the strategy and everyday work linkage could be better in both companies to create understanding and commitment. One of the challenges that almost all companies face is the resource allocation between the operational work and innovations. This is especially true for the employee resourcing.

Table 4.5 Comparison of current challenges in the case companies

	Company A	*Company B*
Similarities	• Fuzzy front-end could be more effective and focused • Strategy and day-to-day work linking a challenge • Balancing the innovations vs. operational work: resource allocation	• Fuzzy front-end could be more effective and focused • Strategy and day-to-day work linking a challenge • Balancing the innovations vs. operational work: resource allocation
Differences	• Innovation afternoons could be improved	• The new structures and processes need to be improved and evolved so that everyone can apply them • Instead of too many unofficial discussion and decisions, more visible processes and chances for everyone to have an influence

In company A, related to the fuzzy front-end, the innovation afternoons are in general seen as a good thing, but they include challenges, especially if the employees feel that they do not have time to participate in those and feel that steering and guidance is needed to get the most out of those events. In company B the main challenges are all included to their new innovation processes but also the roles and how decisions are made, and responsibilities divided. One thing is also the possibility for everyone to get their ideas heard regardless of their role in the organization, personal relations and networks or pre-

senting skills. But since the new innovation processes, governance and roles in the organization are still evolving, not too many conclusions can be made based on the current situation.

5. DISCUSSION

5.1 Innovation Project Governance at Different Levels of Project Organization

The first research question was: *Which innovation governance mechanisms do PBOs use at the different levels of the organization?* Both case companies have innovation governance mechanisms in place even though neither of the companies used the term innovation governance in their innovation related projects and portfolios. The companies did not have specific innovation strategies defined, but that does not mean that innovations are not regarded in the corporate strategy. Company A has a product strategy that includes also the innovation aspect and company B was creating an innovation strategy during the time of the interviews. A clearly defined innovation strategy would help focusing innovation efforts through the whole organization (Pisano, 2015) and that is something both case companies should do if they want to make innovation a core competence and match the innovation system with their competitive needs.

It is interesting that innovations are seen as a very important part of the company brand and competitiveness and still the product development is not innovation driven in company A. The importance of innovations is recognized but the strategy does not highlight it. On the other hand, the innovativeness of company A's products cannot be understated. It is possible that the company is so innovation oriented that they do not need to separately consider or highlight it.

It is important to be able to connect the strategy to the innovations (e.g. Müller, 2009; Dinsmore and Rocha, 2012; Pisano, 2015) and the case companies could be more transparent in doing that. It is easier to make project related decisions, whether it is more resources or termination of the project, when the strategy supports those decisions. The strategy must be visible also to the people working in the project level so that they understand the decisions and can commit to working towards the strategic goals. Innovation strategy must be defined and communicated so that it is not clear only for the executive team but everyone who the innovation activities influence in the organization. Information flow between portfolios and projects (Müller, 2009, p. 49) has a key role in achieving this. Especially in company B the communication structure should be clarified.

Equally important is to define and communicate the definition of innovation in the context of the company (Deschamps, 2014). The case companies have different innovation scopes and the employees should understand what kind of innovations are developed in their organization, not just a general definition for innovation which is the case now. The scope should be re-evaluated from time to time. If an organization is only focusing on product innovations, they might miss potential they could have in other innovation aspects like

marketing and process innovations. Since innovation and R&D are not synonyms (Karlsson and Tavassoli, 2016), company A could benefit from rethinking and broadening their innovation definition (Deschamps, 2014, p. 37).

Part of the innovation strategy and scope is to define whether open innovation is done and how that is done and with whom. In case company B open innovating has been tried via different methods but there is no one established way to do it. This not in line with Saebi and Foss (2015) who emphasize that innovation governance agenda should clearly define open innovation objectives if open innovation want to be handled effectively. Important is to evaluate the potential that open innovation might realize and who are the partners that the cooperation is practiced with. Open innovation is not a must, but it can create opportunities that might not be achieved innovating in house.

The importance of communicating the strategy throughout the organization (Too and Weaver, 2014) has been noticed in both case companies, but it is not accomplished as well as it could. When all the employees understand the business strategy, it is easier for them to contribute and understand the decisions that are made in projects and portfolios. It is important to communicate the importance of innovations and recognize all the stakeholders that can contribute to the innovation strategy. There must be processes that enable everyone to communicate their ideas and problems that can be a starting point for ideation and innovating.

Both case companies are regularly evaluating the content of their project portfolio(s) and are not afraid to terminate projects that are missing strategic fit (Unger et al., 2012). Prioritizing is a very important part of portfolio governance and the evaluation criteria should be aligned with the innovation strategy so that the decisions can be justified for all actors in the portfolio and project levels. Clear strategy alignment also helps to make more objective decisions instead of favoring 'pet projects' without any good reasoning. As Unger et al. (2012) point out, good governance including clear selection process helps in making better and transparent decisions and thereby eliminate delays and better allocation of resources.

The processes for collecting ideas and decision-making in the early phases of innovation need to be defined better in both case companies. Even though there might be processes, those need to be transparent so that it is clear why some ideas are selected, and others are rejected (Kock et al., 2015). The same goes with rewarding for innovations. If those processes are unclear, employees may feel that they are not treated equally, and good ideas might be left unsaid. All the relevant stakeholders need to be identified and innovation must be supported in all organization levels and units. The top management plays a big role in this but so does the portfolio and project management as well.

Regardless of how innovation ideation is organized in an organization those ideas should be collected so that they can be evaluated and prioritized. The front-end of innovation

should not be underrated in companies that want to achieve strategic innovations (Kock et al., 2015; Samset and Volden, 2016). In company A, innovations are strongly linked to patenting possibilities and the evaluation whether some feature is an innovation is done after the development rather than before. Pursuit for innovations should be already present in the front-end when ideas are gathered. The initiatives that come from the top management are tied to the corporate strategy, but so should be the bottom-up innovations. In company B, there was no place where to gather the ideas and the personal relations play a big role in which ideas get to be developed. The whole structure is unclear including the strategic connections of the initiatives at least from the regular employee's point of view. There needs to be clear structures how ideas are gathered and evaluated, whether top-down or bottom-up innovation. Organizations should encourage both channels in their ideation and innovation activities (Deschamps, 2014, p. 39).

One of the important decisions that top management need to make according to innovation is the budgeting and how that is defined. There is no one way to do that, but the governance model should support innovation through the good and bad times (Deschamps, 2014, p. 240). It can be wise to have a separate innovation budget to achieve that. A dedicated budget can highlight the importance of innovation and help in turning it a core competence in the company. Neither of the case companies have a long-term continuous and even budgeting for innovation. At times there are bigger investments to innovations and at other times the focus is more on continuous development and operations. There is a risk that the bottom-up innovations do not get budgeting as easily as the top management led initiatives and promising ideas might be lost in the pressure of getting other work done.

If an organization wants to make innovations their strategic core competence (Deschamps, 2014, p. 240), innovation activities should be continuous. In company A, they had an innovation team creating concepts and prototypes, but it became non-existent when the company decided to focus on a big innovation initiative and has not been established again. In company B, the two-year funding for innovation makes sure that there is a focus on innovation for that period but the time after that should be ensured as well.

Equally important decision concerns the human resourcing of innovation activities. That was also seen in both case companies. Company A had innovation afternoons, but some of the employees did not have time to participate in those every time because of deadlines concerning on-going development work. The time pressure and feeling that operational work is more important than innovating is an issue that the management could change by creating a culture where using time for innovating and trying new things that do not necessarily create value is seen as positive and indispensable for the company's long-term evolution (Mainemelis, 2010). Company B has the monetary resources covered for some time but not enough people to engage in innovation and not enough people with suitable skills. Their partial solution has been hiring outside consultants to cover for the lack of skills in some areas, like software development.

The organization should evaluate the innovation project processes used from time to time. In case company B, different methods were used in different kinds of innovation projects (Shenhar, 2001; Salerno, 2015), but that created also confusion among the employees. Regardless of the model chosen, it should be clear why it was chosen. In company B the communication of the different innovation project types would help if those define the processes used in each type of project.

The linking of different project levels (Müller, 2009, p. 80) was either not done deliberately or happened automatically in the case companies. In small and medium-sized companies this can be the case, especially if all the actors and decision-makers are working in the same place and meet regularly and also unofficially between meetings. There is no need to oversteer or to create too many structures if it slows down the agility and fast and dynamic decision-making that is sometimes needed. From time to time, especially if the governance structure is changed, it would be good to visualize the linkage of the different levels. This helps everyone in the organization to understand their roles and responsibilities together with the new processes used.

In both case organizations linking strategy with day-to-day work was seen challenging. There is definitely need for better strategy communication. In company A's case creating a so called middle level between the strategy and individual feature or epic would help in connecting the strategy to the smaller tasks. This same could be applied also in company B. Defining how a project contributes to the innovation strategy would help the project manager and team to commit to the project and also help in evaluating the project in the portfolio level.

5.2   Roles, Actors and Decision-makers

The roles and decision-makers were not highlighted in the research questions, but during the empirical study it became evident that in medium-sized companies the people and dynamics matter a lot also in project governance. Especially the importance of defining roles and accountabilities clearly is connected to good and working governance structures and better decision-making (Blichfeldt and Eskerod, 2008). Well-defined processes are not enough if there is unclarity of responsibilities and wrong amount of steering.

From innovation perspective, the decision of who is responsible for the innovation in organization is crucial. It is also important to have a supporting role since changes in the organizations are inevitable and if the responsible person for example leaves the organization the steering of innovation activities can continue without major difficulties. In many companies the innovation leader role may fall naturally to a certain individual. In both case companies the responsibility for innovations is divided between two-person team. In case company B the hiring of a Chief Innovation Officer (CIO) was a strategic move and because the role is so new, the CTO also has responsibility on the content side. In case company A the CTO and R&D lead share the innovation responsibility, and both

have different roles in realizing strategic targets. The product managers support and have a role in aligning the strategy with the development when doing prioritization decisions. Deschamps (2014, p. 95) stresses the danger of not centralizing the ultimate innovation responsibility. This needs to be evaluated from time to time in the case organizations for example now that there is a new CIO role in company B.

In small and medium-sized companies, the innovation decision-making can be quite easy and should not be complicated with too many structures and levels if that is not seen necessary. This is the case in company A where the organization structure is very flat. In company B there were two kinds of problems, even contradictory, with too much and too little steering on the project level. In some projects there was too much focus on small decisions and details that should be on project manager's responsibility, not the portfolio management or even steering group level. On the other hand, some projects were terminated because of too little steering and support for the project manager. Appropriate level of steering has to be defined to ensure smooth project management.

Even though the organization structure in small and medium-sized companies can be rather flat, it is important to have transparent decision-making in all the project levels. Unofficial decisions made outside set regular meetings can create confusion especially if those come from different people and decision makers and are contradictory to what has been agreed officially. The accountabilities of each person should be made clear even though that can be hard when there are strong personalities and opinions and those people might want to be part of all kinds of decision-making.

Clear definition of roles, responsibilities and the processes that everyone is part of i.e. good governance structures help in achieving that. Conversely, Urhahn and Spieth (2014) found out that in the case of radical innovations, transparency is not as important as the ability to make courageous decisions and therefore could be justified especially in the portfolio level decision-making. Even that might be the case in company B, the decisions done should be clearly communicated to the project.

In case company B personal relationships dictate the decision-making in all the project phases from presenting an innovation idea to one's superior to the actual project management. Everyone should have equal opportunities to present their ideas and selection should be done based on strategic fit (Unger et al., 2012). Managers should try to stay objective and not favor or terminate projects based on their personal feelings. This ensures that not only the people that have strong personalities and opinions get to affect the decision-making. If a project is overlapping different business or management areas defining the roles becomes an even more important step at the beginning of the project.

5.3   The Revised Innovation Governance Checklist

The second research question was: *How should PBOs improve their innovation govern-ance to improve their innovation capabilities?* In previous sections many challenges that the case companies are facing were presented and discussed. Here, an innovation govern-ance checklist is presented to help organizations in forming and improving their innova-tion governance. The initial version of the checklist was presented in chapter two and here it is revised based on the findings in the empirical study.

It is clear that in small and medium-sized companies, governance is not required as much as in large companies. That does not mean that governance and processes are not needed at all. Innovation project governance can be organized in many ways (Deschamps, 2014). The most important thing is to have transparent processes and linkages and clear role definitions. This helps in every level from project to portfolio to justify decisions and also increases the objectivity of the decisions.

In case company B there was a fear that too much governance might decrease the freedom and agility that is needed in innovation. In contrast, it was seen that currently the organi-zation was lacking enough structure and processes which caused inefficiency and diffi-culties in many project phases from ideation to project steering. It is essential to evaluate the current situation in relation to the amount of governance and whether that is needed more, less or in a different form.
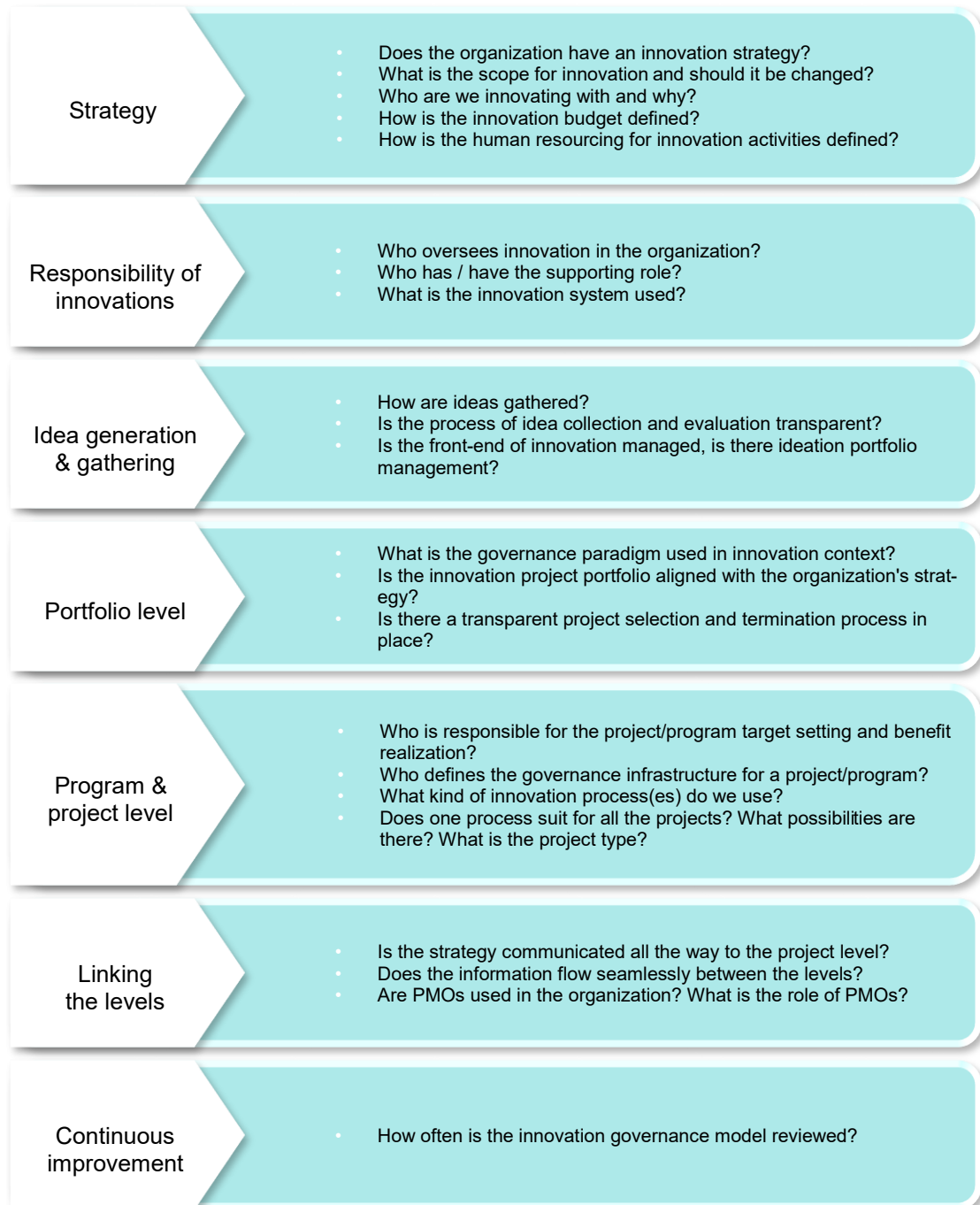
Strategy
- Does the organization have an innovation strategy?
- What is the scope for innovation and should it be changed?
- Who are we innovating with and why?
- How is the innovation budget defined?
- How is the human resourcing for innovation activities defined?

Responsibility of innovations
- Who oversees innovation in the organization?
- Who has / have the supporting role?
- What is the innovation system used?

Idea generation & gathering
- How are ideas gathered?
- Is the process of idea collection and evaluation transparent?
- Is the front-end of innovation managed, is there ideation portfolio management?

Portfolio level
- What is the governance paradigm used in innovation context?
- Is the innovation project portfolio aligned with the organization's strategy?
- Is there a transparent project selection and termination process in place?

Program & project level
- Who is responsible for the project/program target setting and benefit realization?
- Who defines the governance infrastructure for a project/program?
- What kind of innovation process(es) do we use?
- Does one process suit for all the projects? What possibilities are there? What is the project type?

Linking the levels
- Is the strategy communicated all the way to the project level?
- Does the information flow seamlessly between the levels?
- Are PMOs used in the organization? What is the role of PMOs?

Continuous improvement
- How often is the innovation governance model reviewed?

Figure 5.1 *The revised innovation project governance checklist*

The checklist is divided into different governance themes including the different levels in PBO. First there are questions that help in defining the organization's innovation strategy. That includes decisions about open innovation and the resourcing of innovation activities in the organization. Second, there are questions about the role that takes main responsibility of innovations in the organization as well as the supporting role. Innovation system includes processes and structures that define how the organization searches ideas, turns them into concepts and prioritizes the funding and is linked to other categories in the checklist.

Idea generation and idea gathering is related to innovation system definition and the processes and tools that are used in the early phase of innovation to ensure comprehensive idea generation and gathering. Portfolio governance must include the processes for evaluating projects so that decisions regarding new projects, project termination and prioritization can be made in a transparent way. The governance paradigm that influences in the background is also evaluated here and it can define how the project governance is constructed. In portfolio level the 'what' and 'how' decisions are done and the link to innovation strategy is realized.

In project and program levels there are questions about the target setting and who is responsible of those. It can be the responsibility of e.g. a project owner or a project sponsor. Definitions about project and program processes need to be done also. Different projects may need different processes. In company A, all the development was done using agile methodologies which suits well for software development. Company B had their own innovation process defined, but the practices varied between different projects according to the innovation type. It is important to review different project methodology possibilities. The methods used in past projects should be evaluated to see which ones work well and in what kind of project setting.

From the case research point of view, the most important thing in linking all the levels together is to communicate the strategy successfully to all the levels and everyone in the organization. This means that often the strategy has to be divided into smaller and easy to understand pieces so that it is easy to justify why certain things are important. This helps also the management in prioritizing decisions. From governance point of view, the linking should ensure information flow between different levels. PMOs can help in this but might not be necessary in small or medium-sized companies.

Last, it is important to determine how often the whole innovation governance model is reviewed. It gives opportunity to review how well the current governance model works and what are the difficulties faced. This review is also important because the organization's priorities can change during time and it can affect the innovation strategy, portfolio and projects. Then also the governance model might need to be modified.

Using this checklist as a tool when discussing about the innovation governance mechanisms helps to take into account the various aspects that affect the efficiency and communication in and between the different project levels. Well-organized governance supports the management of portfolios, programs and projects. It also supports the decision-making, communication and reporting, and the day-to-day work. Most importantly it ensures strategy alignment i.e. that right things are done.

6. CONCLUSIONS

6.1 Academic Contribution

This research contributes to earlier research of project governance and innovation by discussing the linkage between those themes. The innovation point of view in project governance in all the project levels has been missing and innovation project governance has only been discussed in few studies (e.g. Lerch and Spieth, 2012; Urhahn and Spieth, 2014; Kock and Gemünden, 2016). A qualitative case study in two project-based organizations was used as an approach to the topic. This research had two research questions which were answered in the previous chapter.

This study revealed that innovation governance is not thought much in the medium-sized case companies, but it does exist to some extent. A need and importance to clarify the whole flow from innovation strategy through project portfolio to program and project levels is seen in both companies. Especially the need and difficulty to link strategy to projects and the smaller components a project is divided into is seen in both case companies. This is in accordance with the findings of previous research (e.g. Müller, 2009; Dinsmore and Rocha, 2012; Pisano, 2015). Different levels and phases of innovation development were highlighted when describing the governance mechanisms: strategy, portfolio, program, project, idea generation and selection, and linking these together. The early phase of innovation i.e. the idea generation and selection and the mechanisms to support those activities are the hardest to link into innovation project governance.

Compared to the governance models that Müller (2009) and Dinsmore and Rocha (2012) present, in medium-sized organizations the linking of the different levels was thought to happen automatically in the case organizations hence it does not have to be highlighted too much if it works well already. In small and medium-sized organizations, the people often work quite closely together and therefore strict governance structures in that sense are not always needed. This strengthens the conclusion that the correct amount of governance and what it contains is unique to each organization.

The importance of defining roles and decision-making responsibilities was highlighted in this research. That is an important part of innovation project governance that the defined processes support and has not been emphasized in earlier research apart from Deschamps (2014). Poorly defined roles and responsibilities create inefficiency in the project and portfolio management. It can also affect the project steering and leave the project manager to experience a lack of support or on the contrary too much interfering.

A checklist for supporting the creation and reviewing of innovation project governance was proposed. The checklist highlighted the different aspects that innovation project governance should include. It can be used as a whole to determine the overall framework for innovation project governance or applied partially if a certain innovation area, like the idea generation phase, needs to be improved.

6.2   Managerial Implications

This study helped to reveal what kind of project governance mechanisms medium-sized companies apply when pursuing innovation. Governance supports efficient project development, but there is a need for an innovation perspective when forming the governance structures. This study has identified factors that need to be considered when creating innovation project governance for an organization. Innovation project governance checklist presented in chapter 5.3 is a good starting point that the case organizations can use when forming innovation governance structures.

The study revealed that the case companies were missing a clear definition for innovation. Defining innovation from the company's standpoint helps in creating the innovation strategy and scope. These both should be communicated in the organization. If people define innovation differently or just based on a textbook definition, innovation activities can also be governed and managed incoherently, and therefore not all people are able to commit to innovation initiatives. Thus, forming an innovation strategy is the prerequisite for effective innovation governance in an organization.

When there is an innovation strategy, the front-end of innovation and all the decision-making related to that has a base. Both case companies need to clarify their front-end processes starting from a tool or a platform where everyone in the organization can input ideas. Those initiatives should be treated equally on the portfolio level and prioritized based on the innovation strategy.

The role of different actors and decision-makers was seen important in project governance. Poorly defined roles and accountabilities create a situation where people with strong personalities dictate decisions that are not on their responsibility. Good role definition steers the decision-making processes at different levels and helps for example project managers to seek for support when needed. This is something that should be done especially in case company B. In the best case the processes and structures together with good management and decision-making create a very good governance for the innovation projects.

The process of forming innovation strategy and governance models supports also the budget and resource allocation. When the scope of innovation and processes for achieving the strategic targets have been established, justifying e.g. a separate innovation budget or

a team dedicated to innovation prototyping is easier. The top management and the innovation leader have a responsibility in creating an innovation positive environment where innovations are seen important and worth investing.

The proposed checklist can be used to check that all the topics related to innovation project governance are considered and have been defined in the organization. It can be used to create an innovation project governance framework for an organization. The individual themes can be highlighted if the focus is for example on different project methods. Innovation project governance is a very broad topic and there are certainly deficiencies in this model, but it can help the top management to approach the topic if innovation want to be made a core competence of the company.

6.3   Evaluation of the Research

Many factors decrease the reliability of this research. Case studies have been criticized for not being easy to generalize. Even though this is a multiple case study, there are only two case companies and the results can be only applied narrowly. Multiple data collection techniques improve the reliability of the study. In this research, only semi-structured interviews were used as data source. The semi-structured interviews give a lot of power to the interviewer and some important aspects may have been missed and some smaller ones highlighted too much. In the interviews the interviewee may interpret the questions differently than the interviewer which may lead to misunderstanding of that specific question. The researcher can make subjective interpretations when analyzing both the literature on the research area and the data that was conducted from the case companies. This may lead to conclusions without sufficient empirical justification.

There were only two case companies which is a small sample and not enough to create comprehensive conclusions on the research area. There were also a relatively low number of interviews which decreases the validity of the research. A bigger scale of opinions and aspects may have occurred if there had been more interviewees that work in different positions. The number of interviews were not even between the case companies which puts them in an uneven setting regarding the results. Also, the quotations were translated, which may have caused misinterpretations.

The checklist introduced was not tested during the research. It combines several different sources of previous study that may have different scopes and perspectives and therefore do not fit together to be used in a single framework. This decreases the validity of the checklist proposed. Both case companies are based in Finland and their innovation activities and R&D are done in Finland. The cultural and local differences e.g. in organization culture and hierarchies decrease the generalizability of the results.

6.4 Future Research

This research leaves a lot of opportunities for future research around the subject. Some are based on the literature review and some came up from the empirical study:

- **The linkage of innovation and project governance.** There is still not a lot of research in this area. Research could include a wider setting and more case companies. Practical studies of innovation governance should be conducted.
- **Innovation and project governance in large and small companies.** This study only focused on medium-sized companies so there is a need for a study of innovation governance as well as project governance study in small and large organizations and how the level of governance differs in these.
- **The proper amount of project governance.** Too much or too little governance cause inefficiency in project environment. The proper amount in large companies v. in small and medium-sized companies. The effects of wrong amount of governance for the project and portfolio performance.
- **The role of decision-makers.** Who are the decision-makers officially and unofficially? The definition and roles of different decision-makers in the organization were highlighted in the empirical part. Future research should find how these roles are defined in an organization, officially and unofficially and how the decisions are made.
- **Innovation project front-end management.** Both case companies found it hard to make the front-end of innovation effective and structured. A practical study of different ways of managing the front-end is needed.

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APPENDIX A: THE INTERVIEW STRUCTURE

1. Haastateltavan tausta: työhistoria, kokemus projekteissa ja johtamisessa, nykyinen rooli ja tehtävä, vuosia nykyisessä roolissa, vuosia tässä organisaatiossa, vuosia aiemmissa rooleissa (vuosia yht. 3P kokemusta)

- Oletko asemassasi organisaatiossa tekemisissä
    - projektien
    - projektisalkkujen
    - ohjelmien hallinnan kanssa?

Tämä haastattelu keskittyy niihin tasoihin, jotka ovat relevanteimpia kokemuksesi kannalta, mutta saa kommentoida vapaasti kaikkea hallintatapoihin tai minkä tahansa projektitason onnistumisiin (tai epäonnistumisiin) liittyen.

2. Innovaatioympäristö ja strategia organisaatiossanne

- Mitä innovaatio tarkoittaa teidän organisaatiossanne?
- (Jos tarvitsee selventää: Voitko antaa joitain esimerkkejä innovaatioista organisaatiossanne?)
- Mitkä ovat organisaationne prioriteetit / strategiat liittyen innovaatioihin? (Miksi innovoitte?)
    - Onko olemassa virallista innovaatiostrategiaa? Onko dokumenttia / esitystä, jota voisi jakaa?
    - Mitä hyötyjä organisaationne hakee innovaatioista?
    - Millaisia riskejä/epävarmuuksia organisaationne ennakoi innovaatioita etsittäessä/kehitettäessä? / Miten valmis organisaationne on hyväksymään epäonnistumiset innovaatioita haettaessa?
- Millaisen arvion antaisit organisaationne innovointikyvylle?
    - Miten innovatiivisina pidätte kilpailijoitanne?
    - Kuinka innovatiivinen organisaationne on verrattuna kilpailijoihinne?
- Miten dynaaminen yritysympäristö on?
    - Miten tämä vaikuttaa innovaatioprojekteihin?

3. Innovaatioiden hallintatavat

- Kuka on vastuussa innovaatioista organisaatiossanne?
- Mikä on ylimmän johdon rooli liittyen innovaatiotoimintaan?
- Miten innovaatiotoiminnan rahoitus ja resurssit jaetaan?
    - Onko innovaatiotoiminnalle oma rahasto/budjetti?
    - Mistä resurssipoolista innovaatioprojekteja rahoitetaan?

- Onko teillä yhtä tai useampaa projektisalkkua, joiden odotetaan tuottavan innovaatioita? Vai oletetaanko kaikkien projektisalkkujen tuottavan joitain innovatiivisia tuloksia?
- Ketkä/mitkä toiminnot ovat mukana innovaatiotoiminnassa?
  - Onko teillä esim. innovaatioryhmää tai -yksikköä? Vai ovatko useat/kaikki yksiköt mukana innovaatiotoiminnassa? Miten vastuut on jaettu?
- Etsittekö tarkoituksella ulkoisia (tieto)lähteitä innovaatiotoiminnan suuntaamiseen? Miten? Keneltä/Mistä? (sidosryhmät, alihankkijat, palvelujentarjoajat, kumppanit, asiakkaat)?
  - Onko ulkopuolelta tulleille ideoille vastustusta ("ei keksitty täällä" -asenne), joka voi toimia innovointia vastaan?
- Kuka päättää, neuvoo ja ohjaa innovaatiotoimintaa (eri tasoilla)?
  - Miten 'lähellä' tai 'osallisina' päätöksentekijät ovat innovaatiotoimintoja?
  - Miten hyvin hallinnointiroolissa olevat henkilöt ymmärtävät innovaatioita?
  - Odotetaanko projekti-, ohjelma- ja projektisalkkujen tasoilla hallinnasta vastaavien henkilöiden (sponsorit, ohjausryhmän jäsenet, jne.) edistävän innovaatioita projekteissa, ohjelmissa ja projektisalkuissa? Millä tavoin?
  - Onko mielestäsi relevanttien sidosryhmien panos (mielipiteet, ohjeet, vinkit) huomioitu asianmukaisesti innovaatioiden päätöksenteossa?
  - Onko mielestäsi sinun mielipiteesi huomioitu (innovaatioiden päätöksenteossa)? (Erityisesti päätöksissä, jotka tehdään asemaasi nähden ylemmällä taholla?)
- Miten organisaatiossasi arvioidaan innovaatioiden hyötyjä (/menestystä / arvoa)?
  - Miten organisaatiosi seuraa innovaatioiden etenemistä/saavutuksia yritys-/projektisalkku-/projektitasolla?
  - Mitä näillä tasoilla mitataan/arvioidaan? Millaista arvoa tai hyötyä innovaatioilta odotetaan / Millainen arvo tunnustetaan? (Sosiaalinen, rahallinen, taloudellinen, markkinaimago, jne.)
  - Ovatko innovaatioiden arvo-odotukset lyhyt- vai pitkäaikaisia? Katsotaanko projektien elinkaarta? (Mistä näkökulmasta? Projekti-, projektisalkkujen, ohjelmatasolla?) Entä ympäristö- tai kestävyystavoitteet? ARVO, muukin kuin rahallinen
- Miten organisaatiosi asettaa innovaatiotavoitteita projekteille / projektisalkuille / ohjelmille?
  - Ketkä ovat mukana projektisalkun (tai projektin/ohjelman) tavoitteiden asettamisessa?
  - Millaisia tapahtumia, systeemejä ja rutiineja teillä on tavoitteiden asettamiseen projektisalkkutasolla? Onko teillä esim. strategisia projektisalkun suunnittelutapahtumia, projektisalkun tarkistus-/katsaustapahtumia, jotain muuta?

o Miten määrittelette innovaation tason (radikaali vs. inkrementaali; uusi firmalle/asiakkaalle vs. uusi maailmalle tms.)? Tasapainotetaanko innovatiivisuutta projektisalkun tasolla?

4. Seuraavassa osiossa keskitytään tarkemmin prosesseihin, joita organisaatiossa käytetään innovaatioiden hallintaan.

Erityisesti projekti-, projektisalkku ja ohjelmatasoilla. Myös koko yrityksen laajuiset lähestymistavat ovat relevantteja.

- Miten formaaleja teidän innovaatioiden hallintatapoihin liittyvät prosessinne ovat?
  o Jos on olemassa virallinen innovaatioprosessi, onko siitä mahdollista näyttää dokumenttia / ohjeistusta?
- Voitko selittää lyhyesti menettelytavat, joilla innovaatiotoimintaa ohjataan ja opastetaan? Menettelytavat, järjestelmät, määritellyt roolit ja vastuut, proseduurit, käytänteet?

(VALINNAINEN: Jos auttaa selventämään asiaa → seurataan projektia prosessin kautta)

- Jotta saadaan ymmärrys prosessista, tuleeko sinulle mieleen yrityksenne viimeaikaista projektia, jossa on tuotettu joku innovaatio ja joka meni prosessina tyypillisten prosessivaiheiden ja päätöksentekokohtien läpi?
  o Mistä idea sai alkunsa? (Mistä ideoita yleensä saadaan? Mikä on ideoiden alkuperä?)
  o Keitä oli mukana?
  o Miten rahoitus jaettiin? Käsiteltiinkö se osana yrityksen jotakin projektisalkkua?
  o Miten innovaatioprojekti eteni? Mitkä olivat avaintapahtumat? Muuttuivatko jotkin suunnitelmat matkan varrella? Jos niin kävi, niin miten ja miksi? Miten muutoksia johdettiin/hallittiin?
  o Mitä innovaatioprojekti tuotti, lopputuotteena ja hyötyinä (tai mikä on nykytila, jos vielä käynnissä)? Miten innovaation onnistumista arvioitiin?
- Mitä ajattelet innovaatiotoiminnassa käytettävistä menetelmistä/käytännöistä organisaatiossanne? Auttavatko tai haittaavatko menetelmät mielestäsi innovointia? Millä tavoin?
- Palkitaanko ihmisiä innovatiivisuudesta? Palkitaanko ihmisiä siitä, että he eivät ole innovatiivisia?
- Kuinka joustava teidän innovaatioprosessinne on?
  o Miten hallintatapanne käsittelee muuttuvia olosuhteita (ulkoisessa tai sisäisessä ympäristössä)?
- Kuinka usein ja millä perusteilla perutte tai keskeytätte projekteja? Esimerkkejä?

- Onko olemassa eroja siinä, miten erilaisia innovointiaktiviteetteja hallitaan? Onko esim. kaikilla liiketoimintayksiköillä sama lähestymistapa innovointiin vai käyttävätkö eri yksiköt eri tapoja? Miksi?
- Entä lean ja/tai agiilit/ketterät lähestymistavat ja metodit? Liitetäänkö näitä innovointiin organisaatiossanne? (Onko innovointi osana laajempaa käytäntöjen kokonaisuutta, sisältäen leanin ja agiilin?)
- Miten/miksi/milloin käytössä oleva hallintatapa aloitettiin/ otettiin käyttöön? Miten se on kehittynyt? Oletko/oletteko parantaneet innovoinnin/projektien/projektisalkkujen hallintaa/johtamista?
- Mikä mielestäsi toimii hyvin ja mikä ei tavoissa, joilla innovaatiotoimintaa hallitaan? Mitä ehdottaisit parannuksiksi?

5. Haastattelun yhteenveto ja lopettaminen

- Miten organisaationne kytkee innovaatiotoiminnan eri tasot (projektisalkku, ohjelma, projekti) toisiinsa hallinnan näkökulmasta?
    - Onko näiden tasojen toisiinsa kytkeminen tietoista ja suunniteltua vai tapahtuuko se ikään kuin automaattisesti (tai ei tapahdu)?
    - Kenen vastuulla on varmistaa, että innovaatioiden hallinnan tasot ovat linkitettyjä toisiinsa?
    - Miten hyvin johdatte/linkitätte toisiaan seuraavat innovaatioiden hallinnan tasot? (ts. missä onnistutaan hyvin, missä kohdin on kehitettävää) Onko se tehokasta?
    - Mitkä ovat avainhaasteita? Mitä voitaisiin tehdä eri tavalla ja miksi?
- Onko sinulla mielessä muita asioita liittyen innovaatiotoiminnan hallintaan, joita ei vielä käsitelty tässä keskustelussa?