



A study on the perceived strength and weaknesses of public project governance in Iceland

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Thesis of 30 ECTS credits submitted to the School of Science and Engineering
at Reykjavík University in partial fulfillment of
the requirements for the degree of
**Master of Science (M.Sc.) in Management
Engineering**

October 26, 2024

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Abstract

Through time, public projects in Iceland have frequently exceeded their cost estimates and as expensive public projects are planned, it is important to improve the situation. Here the application of public project governance principles within the public domain is studied. The first step was defining public project governance and what constitutes good public project governance in the literature. Subsequently a recent survey of the perceived quality of project governance was analysed where managers in Icelandic public organization answered list of questions regarding the compliance of project governance practises within their organisations against best practises. The analysis aimed at identifying a holistic view of the strengths and weaknesses of how public project governance principles are applied in Iceland.

Overall, the perception of the participants on how project governance is applied is positive. Some aspects of public project governance appeared to be in better shape than others, including strategy. Possibly due to good information flow in the small Icelandic public sector. Other aspect where lacking. The results indicated that risk management, project management offices and cost-benefit analysis were the weaknesses of public project governance in Iceland. It was recommended to improve knowledge of risk management and project management and use Norwegian governance as a model.

Rannsókn á ætluðum styrkleikum og veikleikum opinberrar verkefnastjórnsýslu á Íslandi

Berglind Ósk Guðmundsdóttir

október 2024

Útdráttur

Í gegnum tíðina hafa opinber verkefni á Íslandi oft farið fram úr kostnaðaráætlunum sínum og þar sem fyrirhuguð eru dýr opinber verkefni er mikilvægt að bæta úr þessari stöðu. Hér er rannsakað hvernig beiting stjórnarháttanna í opinberum verkefnum innan hins opinbera getur bætt ástandið. Fyrsta skrefið var að skilgreina stjórnarhætti í opinberum verkefnum og hvað felst í góðum stjórnarháttum samkvæmt fræðunum. Því næst var greind nýleg könnun á upplifun um gæði stjórnarháttanna, þar sem stjórnendur hjá íslenskum opinberum stofnunum svöruðu lista af spurningum varðandi það hvernig stjórnarháttum væri fylgt eftir innan sinna stofnana í samanburði við bestu venjur. Markmiðið með greiningunni var að skapa heildstæða sýn á styrkleika og veikleika í beitingu stjórnarháttanna í opinberum verkefnum á Íslandi.

Í heildina var upplifun þátttakenda jákvæð hvað varðar hvernig stjórnarháttum er beitt. Sumir þættir stjórnarháttanna í opinberum verkefnum reyndust vera í betra ástandi en aðrir, þar á meðal stefnumótun, sem gæti mögulega stafað af góðu upplýsingaflæði í litlu opinbera kerfi Íslands. Aðrir þættir voru hins vegar ábótavant. Niðurstöðurnar bentu til þess að áhættustjórnun, verkefnastjórnun og kostnaðar- og ábatagreining væru veikleikar í stjórnarháttum opinberra verkefna á Íslandi. Lagt var til að auka þekkingu á áhættustjórnun og verkefnastjórnun og nota norska stjórnarhætti sem fyrirmynd.

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Acknowledgements

I would like to express my sincere gratitude to all those who have supported me through the completion of this master thesis. First, I want to thank my supervisor Þórður Víkingur Friðgeirsson for his support and guidance throughout this project. I would also like to extend my gratitude to him for providing me with valuable data for my research.

Furthermore, I would like to express my gratitude to my family, my boyfriend Kristján Ingi Jóhannsson and our daughter Emilía Eik Kristjánsdóttir, for their endless support, understanding and patience. Finally, I want to thank my father for proofreading my thesis.

Berglind Ósk Guðmundsdóttir

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1. Introduction

Effective implementation of public projects in Iceland is paramount due to the substantial financial investments made annually. The year of 2023 the public budget amounted to 1930.7 billion ISK or 45.1% of GDP[1]. Considerable part of that budget can be expected to be investment in public projects, but a recent survey conducted at the University of Reykjavík reveals that only infrastructure projects initiated by public sectors in Iceland over the next two decades are projected to require a minimum investment of 1500 billion ISK. According to a study at the University of Reykjavík, the commencement of major public projects carries a significant risk, with a 90% likelihood of exceeding budgetary allocations, resulting in an average overrun of approximately 60%. This discrepancy often triggers societal controversy and prompts scrutiny regarding the adherence to proper project management principles [2]. Authorities in Norway also had to cope with the same problem in the past but appear to have reduced the problem considerably through changes in the governance of public projects [3]. As a prologue to this study, it is therefore intriguing to introduce the Norwegian governance model, which serves as an example of best practices.

1.1 Norwegian public project governance

Decision-making regarding public projects has a unique difference, compared to private ventures, in that those making the decisions to undertake the projects do not bear financial responsibility themselves and are therefore arguably not as incentivised to risk of for instance cost overruns. Typically, taxpayers are the ones who ultimately fund public projects. The issue that arises is that, since individuals are not risking their own capital, other considerations may influence decisions, rather than the societal benefits of the project [4]. This problem exemplifies the need for a project governance framework and processes that ensure a public project is managed effectively, aligning with strategic goals, defining roles, responsibilities, and decision-making authority, while ensuring accountability, risk management, and performance monitoring[5]. It is interesting to look at how Norway has dealt with this case [3]. Norway is one of the countries that have proactively addressed the challenges of cost and time overruns by developing comprehensive governance frameworks to mitigate these issues. In 1997, the Norwegian Government formed an inter-ministerial committee, led by the Ministry of Finance, to assess 11 projects for decision-making adequacy and implementation effectiveness. The committee found that inadequate early-phase planning led to significant cost overruns. A contemporaneous report on continental shelf investments also identified major cost overruns in 13 projects, with budget deviations of 20-40% common in the 1990s [3]. Normalizing cost overruns at this level was deemed unacceptable, leading to the introduction of external quality assurance during the decision-making phase for major public projects, now known as the State Project Model [6].

As mentioned above, Norway is one of the countries that has made significant changes in managing large public projects, primarily by developing comprehensive governance frameworks. The Ministry of Finance in Norway oversees the administration of scheme which is fundamentally straightforward with only two decision gates. The model operates under the principle of "business as usual," meaning that no significant changes are required in the procedures of ministries and agencies, allowing them to continue project implementation as before. However, the model imposes stricter requirements on planning documents to ensure quality and thorough analysis. It also mandates the evaluation of multiple alternatives, including the zero option (doing nothing), to counteract path dependency—a common tendency to default to previously used solutions. This approach addresses the issue of relying on past solutions that may no longer be optimal due to changing circumstances, underlying assumptions, user groups, and priorities [3]. The State Project Model has been successful, and a study from 2013 indicates that 80% of projects remain within or on the Parliament approved cost frame[7].

In the Norwegian State Project Model, Quality Assurance 1 (QA1) and Quality Assurance 2 (QA2) are key mechanisms designed to enhance the decision-making process for major public investment projects.

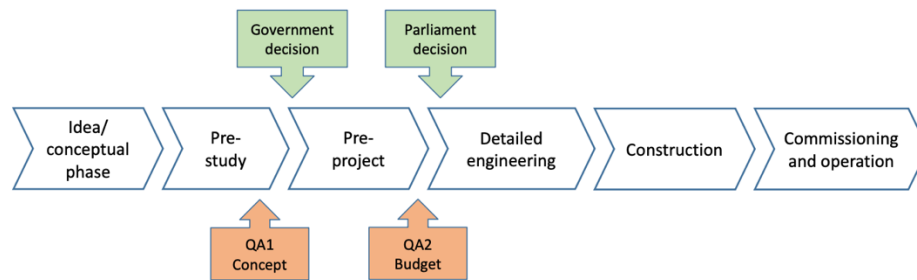


Figure 1: The State Project Model [3]

QA1 is conducted after the pre-study phase and focuses on the choice of concept. The purpose of QA1 is to ensure that the selected conceptual solution aligns with societal needs and objectives. It involves a thorough analysis of alternative solutions, including the zero-option to evaluate their effectiveness and societal impact. This phase helps mitigate the risk of path dependency, where agencies might favour previously used solutions without considering changing circumstances or new opportunities. QA1 aims to facilitate a strategic choice of concept, ensuring that the decision is well-founded before the project advances to the pre-project phase.

QA2 occurs after the pre-project phase, just before the Parliament's appropriation decision. This phase focuses on the management documentation and budget estimation. QA2 ensures that the project is ready for implementation, with realistic budgets and a solid strategy to control costs and timelines. It includes a stochastic cost estimation process to predict potential budget overruns and establish appropriate contingency reserves. QA2 is critical for achieving operational success by ensuring that the project's management plans are robust and that the cost estimates are reliable and transparent [3].

The choice of concept is crucial for a project's tactical and strategic success. Although it's too early to fully assess the impact of the QA1 scheme—since none of the QA1 projects have been completed—it is evident that systematic appraisal of conceptual solutions offers significant benefits. This process compels planners to consider broader societal aspects rather than focusing prematurely on a single technical solution, increasing the likelihood of selecting the most effective option. Moreover, decision-makers often consider the quality assurer's recommendations, suggesting that QA1 has already contributed to improved project effectiveness. Additionally, the scheme has inspired similar initiatives in other ministries and organizations.

The results from the first 40 projects subjected to QA2 indicate that approximately 80% were completed within their budgeted cost, marking a significant improvement compared to past performance. The difference between the final cost and the steering frame is nearly symmetrical around the expected value, indicating effective cost control at the portfolio level for major investment projects. The symmetrical distribution of cost deviations, both positive and negative, also suggests that there is no undue incentive to exhaust contingency reserves [7].

Experience from Iceland and experience from the changes in Norway indicate that there is a considerable room for improvement regarding the governance of public projects in Iceland. As discussed in the literature review, project governance serves as a managerial framework. To maximize the value of an organization's project investments, a clear alignment between project outputs and the organization's business strategy is essential [8]. The framework comprises best practices, guidelines, and tools that support management, decision-making, and project deployment. As previously mentioned, research shows that Iceland trails behind Norway in terms of project governance. It is therefore worth exploring to what extent best practices in project management are applied within the public sector in Iceland. Understanding how these principles are implemented can help identify the strengths and weaknesses of Iceland's governance system and pave a way to improvement if needed.

1.2 Difference between Icelandic and Norwegian governance

When we look at the differences between the Icelandic government framework and the Norwegian, the Norwegian governance model is closely aligned with the principles of good governance, with a strong emphasis on transparency, fairness, responsibility, and accountability. This framework underscores the importance of full transparency in decision-making processes, including the disclosure of the rationale behind decisions, the identification of decision-makers, and the procedures they follow. Stakeholders, including the general public, are kept well-informed, as Quality Assurance (QA) reports are made publicly accessible once they have been processed by parliament. This model can be seen as both socially responsible and ethical, given its comprehensive evaluation of all project aspects and its consideration of the impacts—both positive and negative—on all relevant stakeholders. A critical component of this governance structure is the principle of responsibility, which is upheld across all levels, from high-ranking political officials to the agencies tasked with project implementation. By promoting transparency, fairness, and responsibility, the model ensures a high degree of

accountability. Moreover, the active participation and engagement of stakeholders are viewed as essential preconditions for effective project governance. This inclusion fosters a more democratic and inclusive process, enhancing the success and legitimacy of governance outcomes[9].

However, Iceland, despite reporting a strong economy and ambitious plans for future investments, has made limited progress in addressing the issue of cost overruns through the application of effective governance measures. Research indicates that cost overruns in public projects are a persistent challenge that requires urgent attention at the highest levels of government[9]. These issues have been identified as significant barriers to sustained economic growth. The Icelandic legal framework governing public project management operates through a top-down approach, wherein the Ministry of Finance sets the overarching guidelines. However, the process by which these guidelines were formulated lacks transparency, raising concerns about the clarity and accountability of decision-making. The official procedures provided are limited to general instructions, leaving individual organizations to determine their own methods for implementing project governance.

According to Ingason et al. [9], there is a considerable gap between the project governance practices currently employed in Iceland and internationally recognized best practices in the field. This disconnect highlights the potential need for reform in governance structures to ensure more effective management of public projects and to mitigate the economic impact of cost overruns.

1.3 Aims and objectives

This study investigates public project governance in Iceland from procedural perspective in the context of the application of project management best practises in the public domain. Through literature review, the definition of the project governance framework is established and the characteristics of good public project governance. Study among Icelandic ministries and study of the legal framework, sheds light on the status of public project governance in Iceland. Its quality is evaluated and theory of good governance, ending with suggestions on improvements.

More specifically, this study aims to answer the following questions.

1. *How is project governance defined in the literature?*
2. *What characterizes good public project governance?*
3. *What are the strength and weaknesses of public project governance in Iceland?*

1.4 Structure of the thesis

This thesis begins with an introduction where the problem of inefficiency of public project governance in Iceland and its importance is established. The structure of this thesis is also laid

out along with the research questions. In chapter two, governance is defined along with the characteristics of good public project governance based on governance theories.

Chapter 3 provides the research design and the methodical approach used for the study. Chapter 4 presents the results of a study into the public project governance in Iceland. Chapter 5 contains discussion of the research, its advantages, and disadvantages, and finally a conclusion.

2. Literature Overview

The section begins by defining governance and then introduces the theories that are considered when evaluating the quality of governance. It proceeds to explain what constitutes good governance, followed by an exploration of the distinct characteristics of project governance. The text then discusses what constitutes good project governance, outlining the specific features of public governance, and concludes with a description of what defines good public project governance.

2.1 Governance

The concept of governance likely originates from the Greek term *kybernan*, meaning to pilot, steer, or direct [10]. Modern notions of "government" and "governance" are derived from this idea. In the 1950s and 1960s, governance was a marginal topic in social sciences, with limited research focusing mainly on higher education and urban governance, highlighting the limitations of hierarchical control in these contexts. However, the significance of governance in social sciences grew substantially after the publication of Oliver Williamson's *Transaction Costs Economics: Governance of Contractual Relations* [11] and the rising interest in corporate governance through law and economics [10]. Governance now denotes a transformation in the concept of government, pointing to a new process of governing, a different state of ordered rule, or a novel method through which society is governed [12].

Governance establishes a framework for ethical decision-making and managerial actions within an organization, grounded in transparency, accountability, and clearly defined roles. It distinguishes between ownership and task control, setting clear boundaries for management actions by outlining the organization's goals and the methods to achieve them. Additionally, governance defines the processes managers should follow in overseeing their areas of responsibility. Without a governance structure, an organization risks conflicts and inconsistencies in achieving its goals, leading to inefficiencies that can disrupt operations and negatively affect profitability [13].

2.1.1 Governance theories

Theories commonly employed to explain various governance approaches are essential to understanding the field. This chapter explores several of these theories, including organizational theories such as shareholder theory and stakeholder theory. Additionally, two behaviour-related governance theories, agency theory and transaction cost economics (TCE), are also discussed in this chapter.

2.1.1.1 Shareholder Theory

The Shareholder Theory of corporate governance emphasizes the maximization of shareholder return on investment (ROI). It involves the implementation of structures, such as contracts and policies, designed to ensure that managerial actions are aligned with the interests of shareholders. This theory is predominantly associated with corporate governance practices in the United States and the United Kingdom and is linked to the Chicago School of Law and Economics. According to this perspective, companies are viewed as the property of shareholders, with managers acting as their agents, a concept rooted in agency theory. This approach prioritizes the interests of shareholders over those of other stakeholders, focusing primarily on financial outcomes rather than qualitative aspects, such as employee well-being and ethical standards. Proponents argue that concentrating on a single financial metric simplifies management processes. In project-oriented organizations, decision-making is driven by a shareholder-centric perspective, with the objective of enhancing shareholder value. However, research by Cooper, Edgett, and Kleinschmidt suggests that companies with a strong emphasis on financial returns may underperform within their industries. The causal relationship remains unclear, as it is uncertain whether this focus on financial returns leads to poor performance or is a consequence of it [14].

2.1.1.2 Stakeholder Theory

In 1984 R. Edward Freeman's published the Strategic Management- A Stakeholder Approach, which would be the focal point in the stakeholder approach. The concept of stakeholders, along with stakeholder management or a stakeholder approach to strategic management, emphasizes that managers must develop and implement processes that address the needs and interests of all relevant groups with a vested interest in the organization[15]. Stakeholder Theory expands the scope of corporate responsibility by considering the broader social obligations of organizations. It conceptualizes a firm as a system of stakeholders operating within a larger societal context that provides the necessary legal and market infrastructure [13].

In contrast to Shareholder Theory, which prioritizes short-term financial results, Stakeholder Theory incorporates both long-term financial objectives and qualitative measures such as corporate social performance, reputation, and goodwill. Stakeholders are broadly defined to encompass anyone affected by the organization, ranging from employees and suppliers to communities and society at large, thereby integrating the concept of Corporate Social Responsibility (CSR) [13].

2.1.1.3 Transaction Cost Economics

At its core, Transaction Cost Economics (TCE) offers a theoretical framework for understanding how business transactions are organized and structured, particularly in complex decision-making environments [16]. The efficiency objective involves selecting the most appropriate organizational structure, one that aligns best with the specific characteristics of the transaction. For instance, managing a complex, high-risk, and recurring transaction through a buyer-supplier contract may incur significant costs. In such cases, vertical integration—where

the transaction is internalized within the organization—often proves to be a more economically efficient alternative compared to relying on market exchanges[16]. This theory is particularly valuable in project management, where it helps determine appropriate contract types and governance strategies. However, TCE has faced criticism for its simplicity and the challenges associated with accurately measuring transaction costs [13].

2.1.1.4 Agency Theory

Agency Theory examines the relationship between principals (such as shareholders) and agents (such as managers) within an organization, with a particular focus on the potential conflicts of interest that arise when a principal delegates authority to an agent to act on their behalf [13]. Agency relationships are pervasive across various contexts. Virtually all contractual agreements, such as those between employers and employees or between the state and its citizens, inherently involve significant elements of agency[17]. In the context of project management, Agency Theory is particularly relevant to the relationship between project sponsors (principals) and project managers (agents). The theory emphasizes the importance of establishing effective contracts and governance structures to manage the risks associated with information asymmetries and conflicting interests [13].

The above-mentioned theories exemplify the core value system, processes and policies that allows project success to the best interest of all stakeholders [13].

2.1.2 Principles of good governance

The concept of governance is closely intertwined with institutional values such as democracy, respect for human rights, and the pursuit of greater efficiency and effectiveness in the public sector[18]. There is no universal model for good corporate governance; however, several common principles are consistently recognized. The Organization for Economic Cooperation and Development (OECD) have presented six different principles of good governance. The principles build upon these shared elements and are designed to accommodate the variety of governance models that exist across different contexts [6].

- **Principle 1: Ensuring the basis for an effective corporate governance framework**

The corporate governance framework should facilitate transparent and equitable markets while ensuring the efficient allocation of resources. It must align with the principles of the rule of law and provide a robust foundation for effective oversight and enforcement mechanisms.

- **Principle 2: The rights and equitable treatment of shareholders and key ownership functions**

The corporate governance framework should safeguard and promote the exercise of shareholders' rights, ensuring equitable treatment for all shareholders, including

minority and foreign investors. It should also provide all shareholders with the opportunity to seek effective remedies in cases of rights violations.

- **Principle 3: Institutional investors, stock markets, and other intermediaries**

The corporate governance framework should establish robust incentives across the investment chain, fostering an environment where stock markets operate in a manner that promotes strong corporate governance practices.

- **Principle 4: The role of stakeholders in corporate governance**

The corporate governance framework should acknowledge the rights of stakeholders as established by law or mutual agreements and promote active collaboration between corporations and stakeholders to generate wealth, create jobs, and ensure the sustainability of financially sound enterprises.

- **Principle 5: Disclosure and transparency**

The corporate governance framework should guarantee the timely and accurate disclosure of all significant matters related to the corporation, including its financial status, performance, ownership structure, and governance practices. This ensures transparency and accountability, fostering trust among stakeholders and supporting informed decision-making.

- **Principle 6: The responsibilities of the board**

The corporate governance framework should provide strategic direction for the company, ensure effective oversight of management by the board, and uphold the board's accountability to both the company and its shareholders. This structure promotes responsible governance and aligns the interests of management and shareholders.

2.2 Project governance

It is also important to understand the term project governance. Though there is a lack of generally acceptable definition for it, it can broadly be defined as the framework, processes, and structures put in place to oversee and guide projects throughout their lifecycle. It involves defining roles and responsibilities, establishing decision-making processes, and ensuring accountability at various levels within the organization. Effective project governance provides the necessary oversight to ensure that projects are executed efficiently, on time, and within budget while delivering the intended outcomes that contribute to the organization's strategic goals [19].

The PMBOK defines project governance as an oversight function that is aligned with the organization's governance model and that encompasses the project life cycle. The project

governance framework provides the project manager and team with a structured approach, encompassing processes, decision-making models, and tools essential for managing the project. This framework is designed to support and control the project to ensure its successful delivery. Project governance is particularly critical in complex and high-risk projects, offering a comprehensive and consistent methodology for controlling the project and driving it toward success. This is achieved by defining, documenting, and communicating reliable and repeatable project practices. The framework also establishes a decision-making structure, delineates roles, responsibilities, and accountability, and plays a key role in evaluating the effectiveness of the project manager [5].

The primary objective of project governance is to ensure the consistent and predictable delivery of projects and programs, aligning with their intended contribution to corporate strategy and stakeholder expectations. This is achieved through the consistent and coherent execution of governance roles and responsibilities across various management levels throughout the organization [13]. Effective project governance system aims to prevent project failure by ensuring the right projects are selected and executed correctly. "Doing the right projects" involves prioritizing and aligning projects with the organization's strategic objectives. "Doing projects right" requires effective project, program, and portfolio management to meet or exceed stakeholder expectations in terms of scope, quality, risk, budget, and time, ultimately delivering the expected benefits [20].

2.3 Public project governance

In principle general project governance principle apply to all organizations but there are some important differences between private and public projects. The ownership of public organizations is different, they are subject to different legislation and often operate in different sectors of the economy. Incentives within public organization are different and more complicated than in private organizations. While private organizations generally focus on maximizing profit, public organizations have more numerous objectives regarding the welfare of society. That makes goal achievement more difficult to verify. The influence of external stakeholders is more extensive resulting in more complex and time-consuming decision making where the focus is on safety rather than speed.

Public projects have one advantage over private projects, at least in more advanced nations where financing cost for the government are generally lower.

While accountability in the private sector is provided through competition, transparency improves accountability in the public sector[21].

In the beginning of the century, legislation in Norway was changed, requiring external quality assurance for larger public investment projects. At the beginning phase of projects, the choice of the conceptual solution was assessed by external consultants, which included comparing it to other ways of reaching the stated goals. This was to ensure the best use of public funds and to secure strategic success of the project. Later in the project life cycle, before it goes for parliament for approval, the project goes through another quality assurance process, also by external consultants, this time focusing on project cost estimates. This second quality assurance process is meant to ensure operational success of the project.

No other changes were done project management legislation in Norway and government agencies were free to manage their project as they saw fit, which often differed between sectors. Despite that freedom, those two quality assurances had indirect influence on project management, improving its quality. Official publication of those quality assurances is thought to have improved professionalism in project governance and management. Quantitative analysis of costs has shown that projects are now in line with original cost estimates[21].

2.3.1 Characteristics of good public project governance

In order to improve quality of public governance within its member countries, the OECD has published recommendations for effective public investment[14]. It consists of twelve recommendations in three categories.

It emphasizes that public investment should be based on a strategy which has a clear objective, and that investment should be based on local situation. In order to increase efficiency, for example through economies of scale, coordination within the public sector should be enhanced.

The goals for individual projects should be clear from the onset and that the selected concept is the best way of reaching those goals. It is also essential to assess the projects long-term impacts and the risk that it is facing.

In order to protect and increase the value of projects, stakeholder should be engaged throughout the project from the design phase. Care must though be taken to prevent the undue influence of special interest groups.

Market forces, through the financial market and private funding sources should be used as appropriate in order to increase efficiency.

The competence of the public sector regarding public investment needs to be secured and the expertise of public officials and institutions involved in public investment improved. Results should be emphasized, e.g., through contractual forms and learning from experience through information exchange. Transparency should be practiced in the procurement sector and coordinated quality assurance system should be used across the public sector.

Financial management needs to proof high quality. Fiscal framework adapted to the investment objectives pursued should be developed. It should require sound and transparent financial management at all levels of government, including accurate cost estimates and maintenance cost estimates[14].

2.3.1.1 OECD recommended principles for strengthening the effectiveness of public investment.

Table 1: OECD recommended principles for strengthening the effectiveness of public investment[14]

A.	Co-ordinate public investment across levels of government and policies
1.	Invest using an integrated strategy tailored to different places
2.	Adopt effective instruments for coordinating across national and sub-national levels of government
3.	Co-ordinate horizontally among sub-national governments to invest at the relevant scale
B.	Strengthen capacities for public investment and promote policy learning at all levels of government
4.	Assess upfront the long-term impacts and risks of public investment
5.	Engage with stakeholders throughout the investment cycle
6.	Mobilize private actors and financing institutions to diversify sources of funding and strengthen capacities
7.	Reinforce the expertise of public officials and institutions involved in public investment
8.	Focus on results and promote learning from experience
C.	Ensure proper framework conditions for public investment at all levels of government
9.	Develop a fiscal framework adapted to the investment objectives pursued
10.	Require sound and transparent financial management at all levels of government
11.	Promote transparency and strategic use of public procurement at all levels of government
12.	Strive for quality and consistency in regulatory systems across levels of government.

3. Research design

This section outlines the methodologies approach in this study. It includes the design and purpose for the research and the procedures used for data collection, how the data was gathered and processed.

The research is divided into two parts. The first part defines the concepts of project governance and public project governance, along with an exploration of what constitutes effective public project governance. That was performed through a literature review where various scientific papers, books and standards on the subject were studied. As was expected, different definitions exist in the literature for the subject concepts. A definition was thus based on commonalities in those definitions and own assessment. Figure 2 from Ralf Muller [13] visualizes the platform applied when defining the best practices used in the survey.

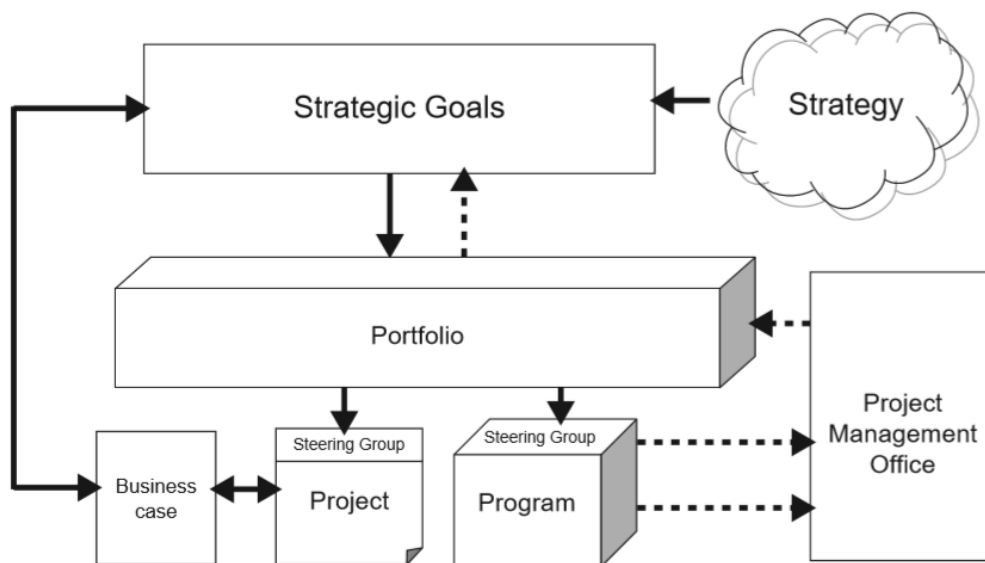


Figure 2. A visualization of project governance framework [13].

The second part of the research is a study of status of project governance within Icelandic public institutions and is based on a survey conducted in the spring of 2024 by a team of MSc students in engineering at Reykjavik University.

The survey consisted of questions in a statement form regarding the essential project governance principles divided into seven categories:

1. Strategic Goals: If strategic goals for projects within the organization are clear, measurable, realistic, with a clear purpose and with a defined timeframe.

2. Portfolio: If the portfolio of projects within the organization reflects the priorities of the organization, manages risks of individual projects, share resources, have a key performance indicator and a governance structure.
3. Business Case: If it is clear what problem each project aims to address, if projects are based on a cost-benefit analysis, if risks have been identified, if feasibility has been identified and alternative solutions explored.
4. Project Management Offices: If Project Management Office exist and is a vital part of project governance, aligns projects with organizational strategy, standardises project management processes, manages resources allocated to projects and reports to stakeholders.
5. Projects and Programs: If project objectives are clear from the onset, roles and responsibilities are clear, detailed project plan exists, project risks are managed, and stakeholders are engaged.
6. Cost Benefit Analysis: If all project costs are identified, project benefits have been estimated, costs have been discounted, risk factors have been analysed and social costs considered.
7. Risk Management: If project risks are identified at the onset, if risk are assessed, mitigated, risk management is ongoing throughout the project and if scenario analysis is conducted.

3.1 Data collection

In the spring of 2024, a survey was conducted by MSc engineering students at Reykjavik University with the aim of investigating the state of project governance in public institutions in Iceland. Their task was to send a pre-prepared questionnaire to public institutions in Iceland. The questions were composed by the author's supervisor for this project. The survey questions were divided into seven categories, all related to project management: Strategic Goals, Portfolios, Business Case, Project Management Offices, Programs and Projects, Cost-Benefit Analysis, and Risk Management. Each category contained five statements that the participants were asked to relate to. The survey was conducted using SurveyMonkey, with each question presented as a multiple-choice item on a five-point Likert scale, alongside options for "Do not know" and "This does not apply to my organization." All the questions can be found in Appendix A.

The study sample consisted of 90 public institutions within 11 different ministries, all of which allegedly practice project management. It should be noted that at the time the ministries were 12. However, the ministry of Foreign Affairs does not operate any sub organizations. The intended respondents were individuals holding middle to senior management positions, who were likely according to their job titles to have knowledge of how projects are planned and executed within their organization. Moreover, some public institutions are very small and others unlikely to apply project as part of their operation. These institutes, for instance courts and institutes with less than five employees, were not included in the study.

In the study 280 public employees holding managerial positions were contacted. In total, 167 fully completed questionnaires were received from the 90 public organizations.

The statements in the survey are all designed to assess the perceived quality of public project governance. They inquire about projects as a management form, which include objectives, timelines, budgets, and teams. Additionally, the survey examines project portfolios, and how they are aligned with organizational objectives. The presence of a well-developed business case, which provides decision-makers with the necessary information to make informed decisions regarding the initiation of public projects, is also addressed. Furthermore, the questions explore the role of potential Project Management Offices (PMOs) within the organizational hierarchy and project management practices. The survey also investigated the use of cost-benefit analysis (CBA), and risk management that are considered important managerial disciplines to ensure project viability.

3.2 Research approach

Surveys based on the Likert scale generate ordinal data and are generally used to generate more quantitative results from inherently qualitative data. Quantitative results enable more robust analysis and enhance objectivity, replicability, and generalizability of findings, with a particular emphasis on predictive accuracy. A fundamental principle of this approach is the requirement that researchers minimize the impact of personal experiences, perceptions, and biases to ensure impartiality throughout the research process and in the interpretation of results. Typically, quantitative studies employ standardized tools, such as surveys or tests, for data collection, and they often rely on probability theory to evaluate statistical hypotheses related to the research questions under investigation [22].

3.2.1 Limitations to research

In this research the overall application of project governance best practice within the Icelandic public domain is investigated. It does not focus on specific ministries or sub organizations.

Moreover, although the study is based on a relatively simple and straightforward measure of the application of best practices biases cannot be ruled out. The people participating may be tempted to respond positively to the application of best practices as it concerns their roles and responsibilities. This may raise questions whether the sample that participated accurately represents the broader population. It is also noteworthy that each participant only responded to a single category of statements making the response pool smaller.

3.3 Data analysis

For evaluation purpose the results from the survey had to be quantified. To begin with, all responses that included "do not know" or "not applicable" were excluded from the dataset, as these answers did not provide substantive contributions to the survey's analysis. The other answers were given a score from 0-4, see Table 2. Each response was assigned a score based

on the degree to which the requirement of the question was met, reflecting how well or poorly it applied.

Table 2: Scoring scale from 0-4

Never	Rarely	Sometimes	Usually	Always
0	1	2	3	4

No baseline exists to compare the answers from the survey to. That is, no other foreign governmental organization have been asked the same questions to the best knowledge of the author. Analysis is thus limited to internal comparison, identifying relative strength and weaknesses of Icelandic public project governance. That is performed by handling each of the seven categories of questions as a separate sample and comparing the average of that sample to the average of the other categories combined in the order to identify differences indicating strength or weaknesses. That difference must be statistically significant in order to ensure it is not due to change and that is established through a t-test.

As the survey generates ordinal data and the difference between the points on the scale is not quantitatively known with precision, only its rank, the options for mathematical analysis are limited. For example, the calculation of a mean is generally questionable as it involves addition and division. Same arguments apply for the calculation of standard deviation. Generally, more appropriate value of representing the central tendency of the data is median or mode.

For such ranked data methods for comparing the statistical difference between central tendency of two samples exist, such as the Mann-Whitney U test. They are though limited as they require same count of observations in the groups being compared which is not the case here[23]. In addition to that, when the sample size of ordinal data reaches a certain size, parametric methods such as the t-test can be used[24]. That is the case here, so the t-test is used for the comparison.

3.3.1 T-test

To evaluate the statistical significance of the survey results, a t-test was conducted. A t-test is suitable when you have collected a random sample from a population and want to compare the sample mean to a reference value. This reference value could be either a known constant or the mean of a second sample. The t-test helps determine whether the observed difference between the means is statistically significant, accounting for the sample size and variability in the data [25]. It is one of the most frequently applied hypothesis tests.

Statistical inference can be categorized into two primary approaches: parametric and nonparametric methods. The t-test, as a parametric test, assumes the data follows a normal distribution, which allows for more precise conclusions when these assumptions are made [26]. Strictly speaking as the survey generates ordinal data, nonparametric test would be required but since the sample size is sufficiently large, a parametric test as the t-test can be used [27]. T-tests can be categorized into two types: the independent t-test, used in this research, which

is applied when the two groups being compared are independent, and the paired t-test, which is used when the groups are related or dependent on each other[26].

Since a t-test is designed to compare the means of only two groups, it was decided to analyse each question category of the survey separately. For each analysis, the selected category was compared to all other remaining categories as a one group. That is, the entire sample excluding the one under examination.

The null hypothesis in an independent t-test states that the population means of two unrelated groups are equal:

$$H_0: \mu_1 = \mu_2$$

Typically, the goal is to determine if we can reject the null hypothesis in favour of the alternative hypothesis, which posits that the population means are different:

$$H_a: \mu_1 \neq \mu_2$$

To evaluate this, a significance level (alpha) is selected and 0.05 is a common value. This alpha value represents the threshold for rejecting the null hypothesis.

From the sample size, mean and standard deviation of the two groups being compared, a t-statistic is calculated, and from that a p-value. P-value represents the possibility that the two groups have the same median an observed are due to chance. If the p-value obtained from the test is less than the selected alpha ($p < 0.05$), the null hypothesis is rejected, indicating that the means are significantly different [28].

4. Results

The purpose of the research was to assess the state of project governance in public institutions in Iceland. In the literature review section, the concept of good public project governance was explained, establishing the foundation for the research. The aim was to examine how project governance is best applied in Iceland through a study conducted on Icelandic public institutions. In this section, the results of that survey will be presented.

The survey consists of 35 questions in 7 categories. The survey generated ordinal data on a five-point Likert scale (always, usually, sometimes, rarely, and never) along with „not applicable“, and “don’t know. Answers from 167 participants were received but each participant only answered a subset of the questions. That resulted in 22-26 answers for each question, totalling 828 answers. Of those answers, 115 were either “not applicable” and “don’t know”. Thus 86% of the answers contributed materially to the survey.

To see the distribution of the data and analyse it, the median, mode, and average for each category were calculated, see Figure 3.

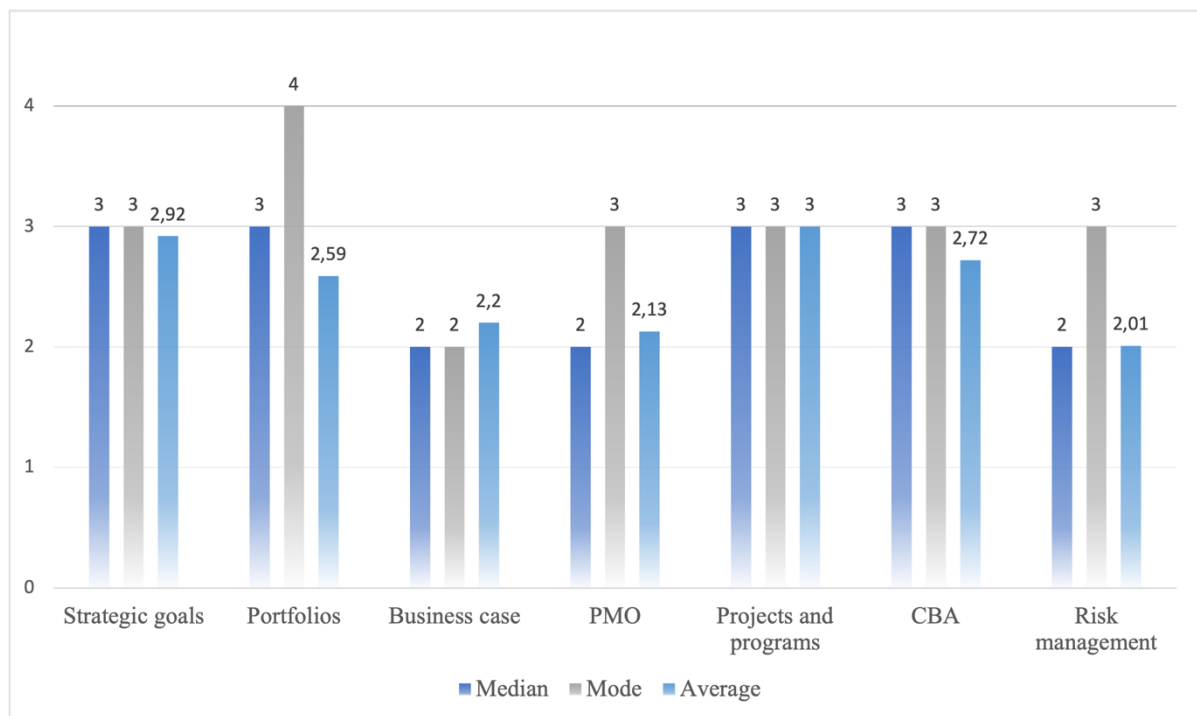


Figure 3: Median, mode and average score of survey questions categories.

In Figure 4, the interquartile range for each category can be observed. Below, a more detailed analysis of each individual category will be provided for further insight.

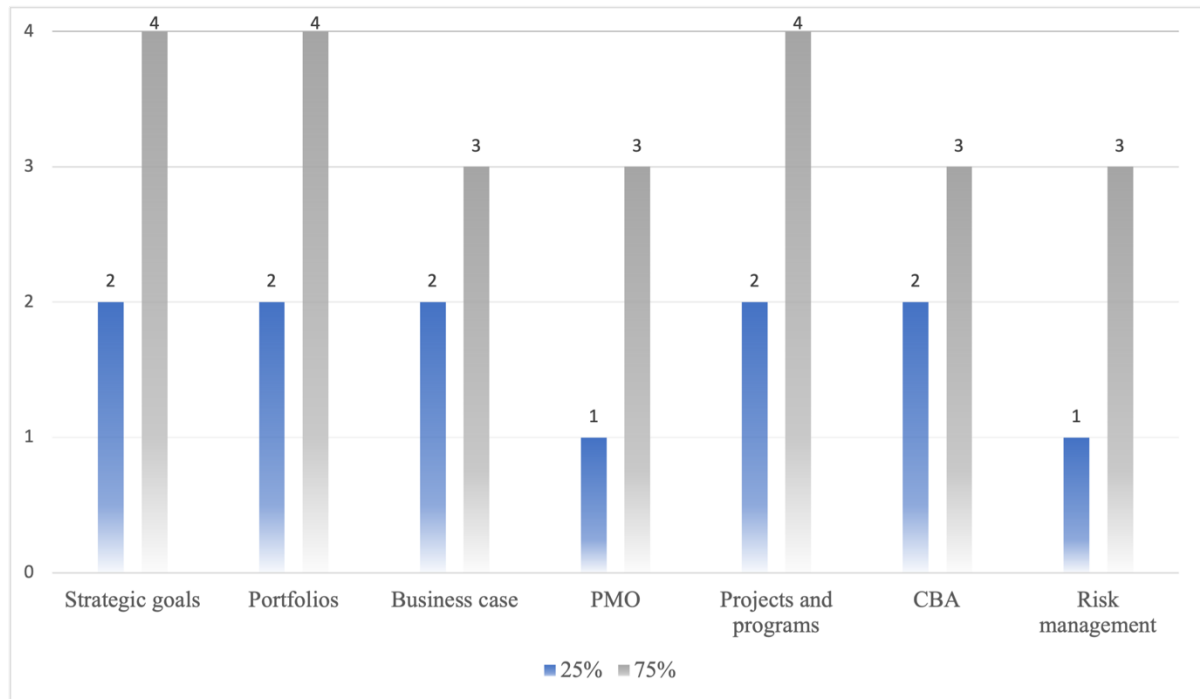


Figure 4: Interquartile range of survey questions score.

4.1 Strategic Goals

Let us examine each category in more detail. The first category is *Strategic Goals*, with an average score of 2.92, which is the second highest among all the categories. The average score of the other categories is 2.44, and according to a t-test, this difference is statistically significant, indicating that the score for *Strategic Goals* is notably better than the other categories. In Figure 5 it is clearer how each question is rated. As shown, the majority of responses are positive, with most falling under "usually" and "always." This can be interpreted as an indication of good project governance.

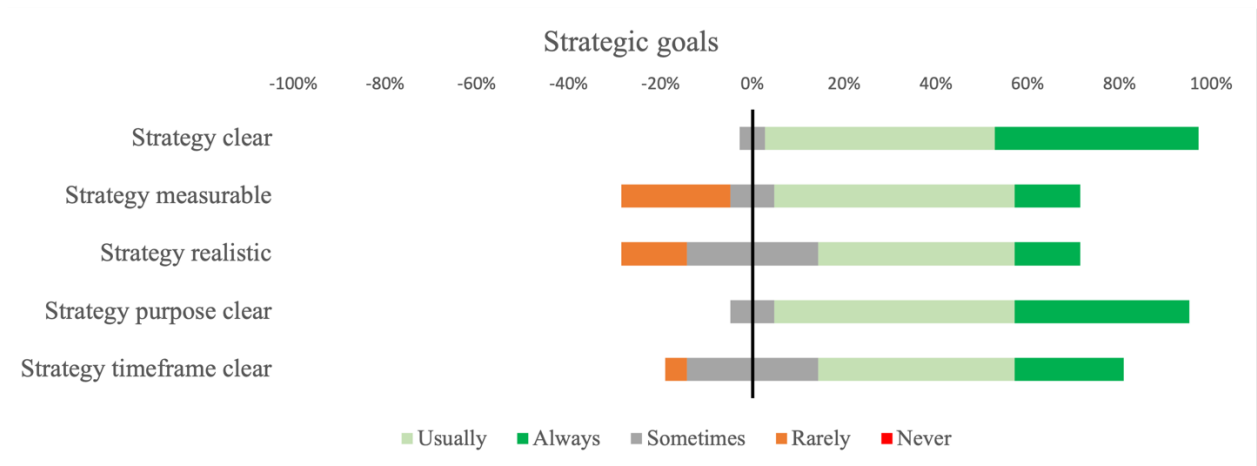


Figure 5: Distribution of survey responses within the Strategic Goals category.

4.2 Portfolios

The *Portfolio* category performed slightly worse than *Strategic Goals*, with an average score of 2.59 compared to an average of 2.5 for the other groups. According to the t-test, it can be concluded that the average score is not significantly different from the average of the other groups, meaning that the condition of the *Portfolio* category is neither better nor worse than the other groups. In Figure 6, the distribution of the questions can be seen, where question 4 stands out with particularly poor results.

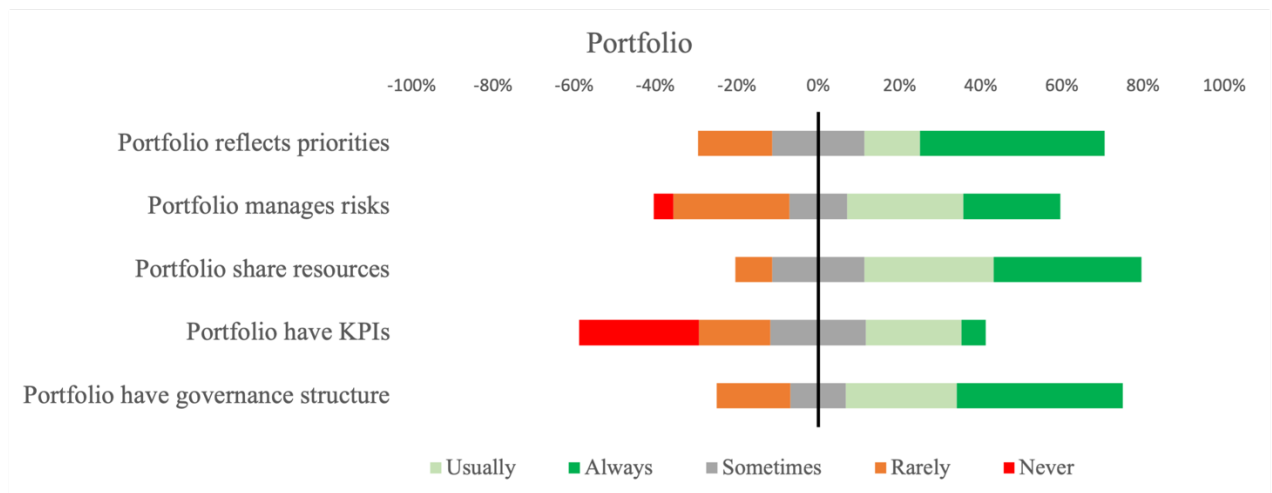


Figure 6: Distribution of survey responses within the Portfolio category.

4.3 Business Case

The *Business Case* category had an average score of 2.20, while the average for the other categories was 2.56. The t-test confirmed that the *Business Case* is significantly worse than

the other categories. In Figure 7, it can be seen that the questions are relatively similar in their distribution, although question 2 performed the worst.

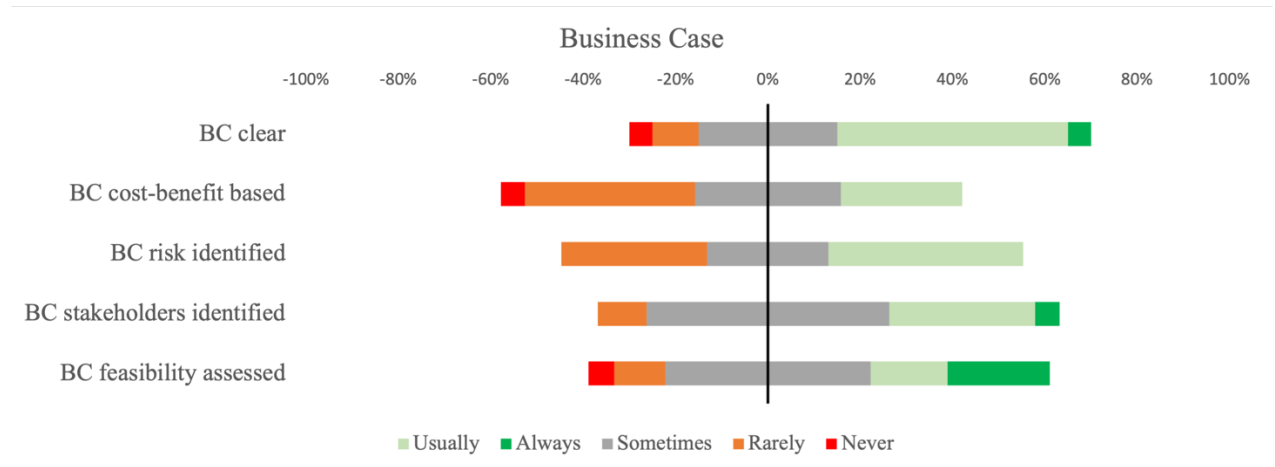


Figure 7: Distribution of survey responses within the Business Case category.

The business case question category has the second highest ratio of “NA” and “Don’t know” answers of all the categories. 23% of the answers were in those two categories compared to 11% of all the other categories, or more than double.

4.4 Project Management Offices

The *Project Management Offices* category had an average score of 2.13, which is the second lowest among all categories. The average of the other categories was 2.58, and according to the t-test, it can be concluded that the *Project Management Offices* category is significantly worse than the other categories. In Figure 8, it is evident that the responses to all questions are quite similar in their distribution.

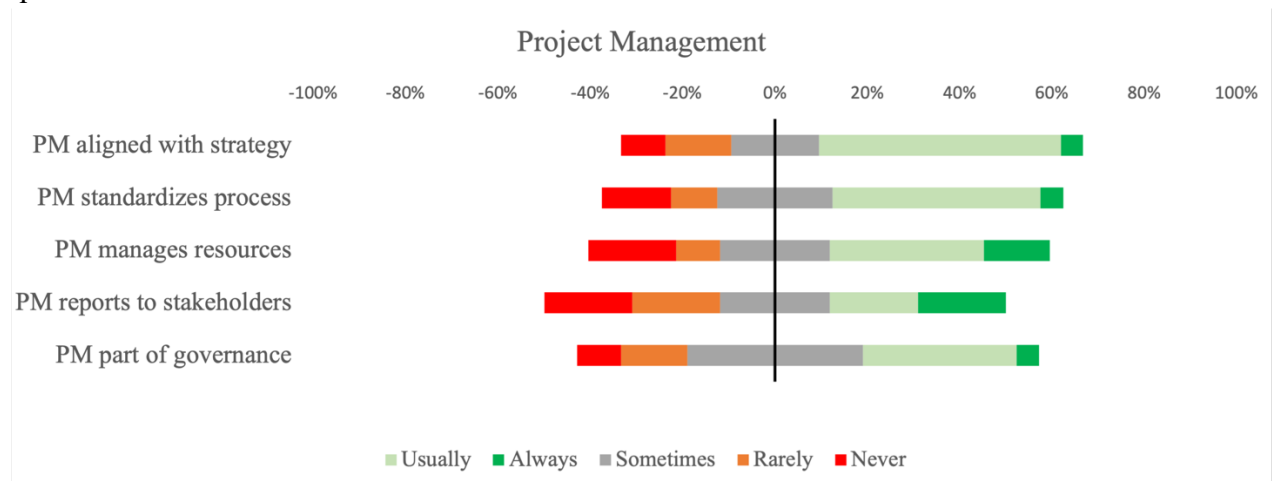


Figure 8: Distribution of survey responses within the Project Management Offices category

The *Project Management Offices* category has the highest ratio of NA responses, 10% or almost double the average of 6%.

4.5 Projects and Programs

The *Projects and Programs* category had an average score of 3.00, which is the highest among all the categories. The average for the other categories was 2.41, and according to the t-test, it can be confirmed that the *Projects and Programs* category is significantly better than the others. In Figure 9, it can be observed that all the questions performed similarly well, except for question 4, which received some "negative" responses, marked as "rarely."

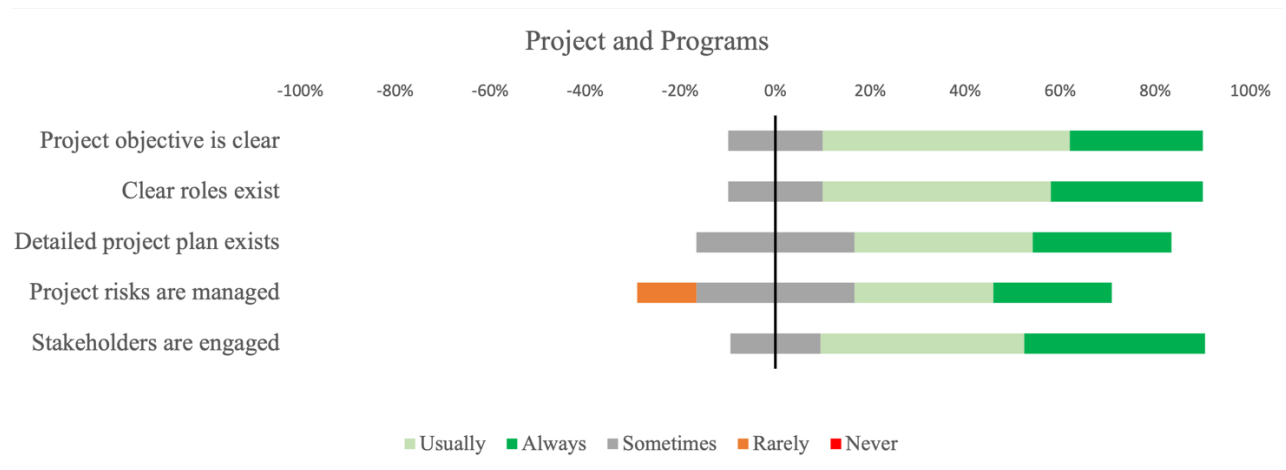


Figure 9: Distribution of survey responses within the Projects and Programs category.

4.6 Cost Benefit Analysis

The *Cost Benefit Analysis (CBA)* category had an average score of 2.72, while the average for the other categories was 2.49. According to the t-test, there is a significant difference between these categories, indicating that *Cost Benefit Analysis* is performing better than the others. In Figure 10, the distribution of responses is shown, and it is evident that question 3 performed considerably worse than the others.

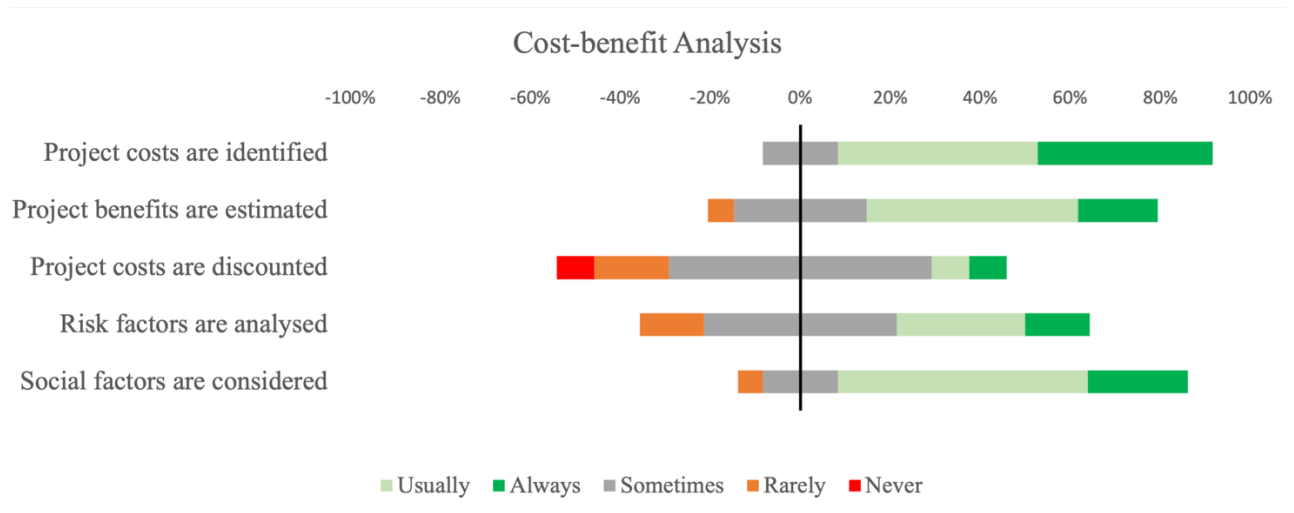


Figure 10: Distribution of survey responses within the Cost Benefit Analysis category.

The *Cost Benefit Analysis* category has the highest ratio of “NA” and “Don’t know” answers of all the categories. 28% of the answers were in those two categories compared to 10% of all the other categories, or almost three times higher.

4.7 Risk Management

One of the categories of questions in the survey covers *Risk Management*. It receives the lowest average score of all categories of 2.01 while the average score for the other categories is 2.6 and t-test shows this is no coincidence.

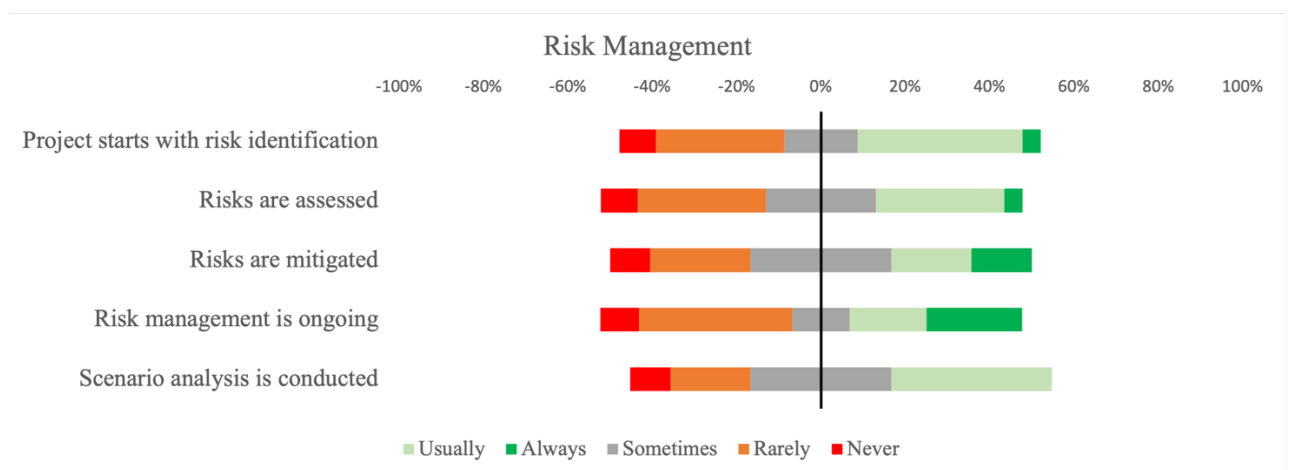


Figure 11: Distribution of survey responses within the Risk Management category.

Questions regarding risk are though not only found in the *Risk Management* category, but the other question categories also include one question regarding risk, except *Strategic Goals* and

Project Management Offices. When they are added to the *Risk Management* category the average goes up to 2.18 which is still considerably below the average of the entire dataset and not due to chance according to a t-test.

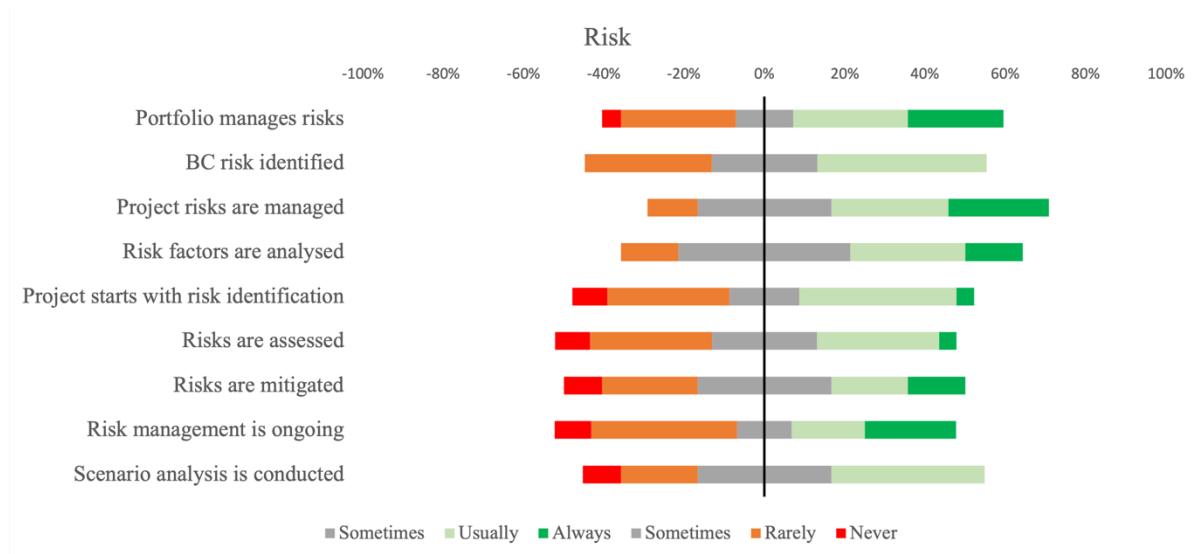


Figure 12: Distribution of survey responses questions regarding risk.

These results indicate that *Risk Management* is the worst aspect of public project management.

On Figure 13, the overall results can be seen.



Figure 13: Distribution of survey responses.

Relative compliance was also calculated for each question and each category, but relative compliance is defined as the ratio of “always” and “usually” to all material answers to the relative questions.

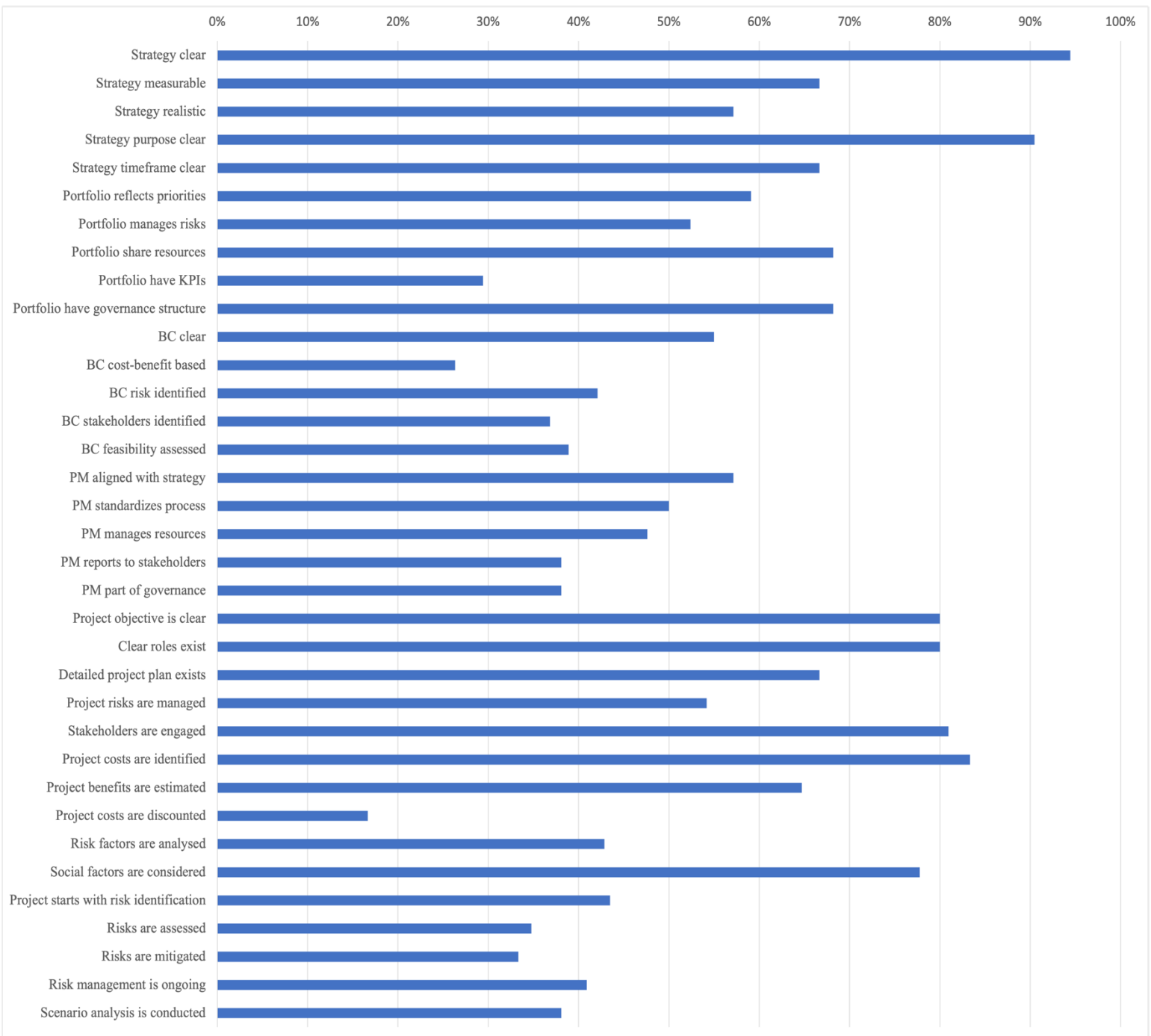


Figure 14: Relative compliance to best practice for each question.

The average relative compliance to best practice is 55%, ranging from 17% for discounting of project costs up to 94% for clarity of project strategy.

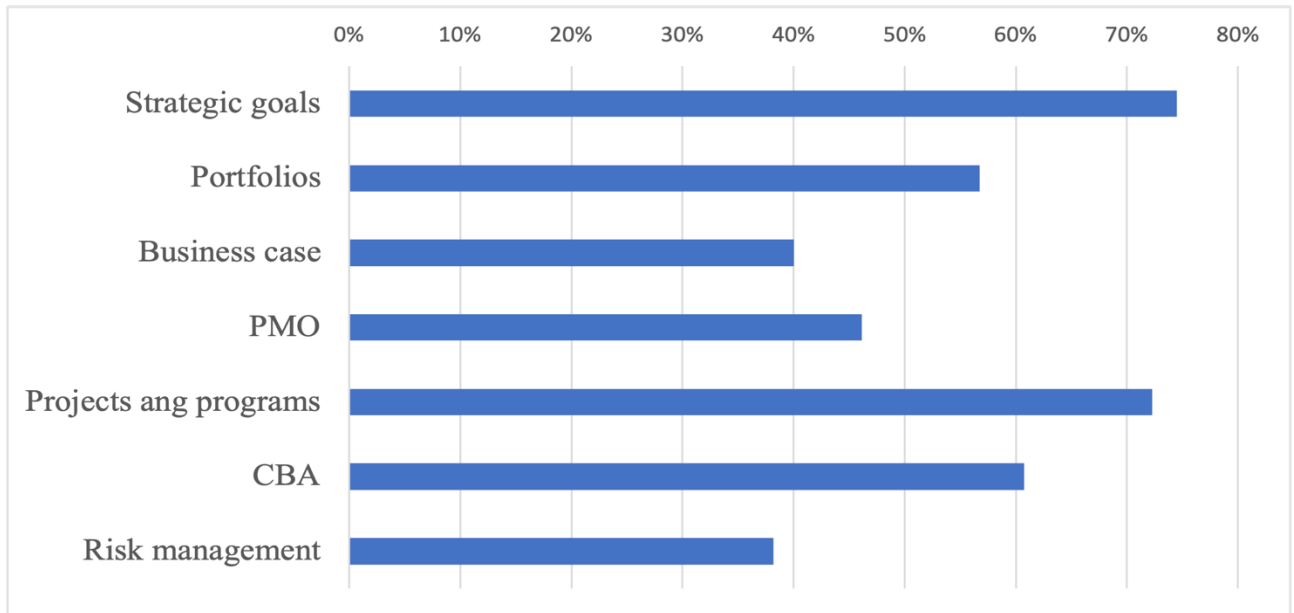


Figure 15: Relative compliance to best practice for each category.

The relative compliance to best practice varies from 38% for risk management up to 75% for strategy.

5. Discussion and conclusion

The motivation for conducting this research was the allegedly poor project governance practices within Icelandic public institutions. Public projects often exceed their cost and time estimates, which causes disruption within society. Researchers have examined Norway, where a project governance framework has been developed that has proven to be effective in dealing with similar problems. This framework has demonstrated improvements in the management of large public projects in Norway and a closer examination of Icelandic project governance reveals that there is apparently a room for the improvement of the governance of larger projects in order to improve the efficiency of their execution.

At the outset of the research, the concept of project governance was studied and defined, with a particular focus on public project governance and the characteristics of effective public project governance in this context. In addition, data from a survey conducted in the spring of 2024 by master's students in engineering at Reykjavik University was studied. This survey focused on the current state of public project governance in Iceland. The findings of the survey were compiled, and the data were analysed. In this chapter, a more detailed discussion of the results will be provided, delving deeper into the outcomes of the research.

5.1 Public project governance in Iceland

The validity of the survey results depends on the assumption that the respondents are both knowledgeable about the subject matter and truthful in their answers. Selection of respondents (middle to senior position within each organization) should ensure reasonable knowledge about the subject matter but they could have interest in skewing the results. For example, they might be interested in making their own work look more positive, answering in a positive manner. They might also be interested in making the results look worse in order to receive additional recourses for project governance. In summary, such self-evaluation always must be taken with a grain of salt but no indication of skewness of the answers was identified.

In addition to the limits to the validity to the survey discussed above, there are limited possibilities for analysing the results of the survey since there is no baseline available to compare the survey results to. However, it is possible to examine the categories internally, identifying which categories perform the worse than others and determining what actions can be taken to improve those categories.

5.2 Acceptable categories

Strategic goals, portfolios, projects & programs, and cost-benefit analysis seem to be the relative strengths of public project governance in Iceland, receiving the most positive score in the survey.

5.2.1 Strategic Goals

The strategic goals and the strategy goal purpose between projects is clear for project managers in most of the cases, giving that category has the second highest average score of all categories and the highest relative compliance to best practice. The reason for that is perhaps the small size of the public sector and close connection to the politicians, from where the strategy originates.

According to the survey, the worst parts of the strategy category have to do with strategic goals not being measurable, realistic, or having a clear timeframe. These are typical project management issues which rest of the survey shows are in relatively worse shape which could explain that.

5.2.2 Portfolios

Project portfolio management is in average shape within the public sector compared to other categories, both with regards to average score and relative compliance to best practice. Projects reflect the priorities of the organization in majority of the cases, which is to be expected as the status of strategy appears to be one of the strong aspects of public project governance. Projects share resources and have a governance structure in large majority of the cases, but key performance indicators are lacking in majority of the cases, which is typical project management which rest of the survey shows are in relatively worse shape. Project portfolio risk management is also lacking and will be discussed below in the section of risk management.

5.2.3 Projects and Programs

Projects & Programs is one of the relative strengths of project governance, getting the highest score and the second highest relative compliance to best practice of all the categories. In most of the cases projects have clear objective, and stakeholders are engaged which is probably due to the small size of the public sector as is the case regarding strategic goals. Roles are clear and detailed project plan exists in most of the cases, which are typically parts of project management and comes thus somewhat as a surprise which could be a coincidence.

Risk management is in the worst shape which will be discussed below in the section on risk management.

5.2.4 Cost Benefit Analysis

Cost Benefit Analysis is above average. Project costs are identified in most of the cases, but they are only discounted in rare cases (17%) which is a source of inaccuracy in a high inflation and interest rate environment as in Iceland. Project benefits are estimated, and social factors considered in most of the cases. Perhaps part of that can be contributed to the requirement of environmental assessment which many large projects are subject to which covers part of those issues.

Management of risk is lacking and will be discussed below in a chapter on risk management.

What is surprising about this category is the high ratio of “NA” and “Don’t know” answers which is almost three times the average of all the other categories (28% compared to 10%). Most of those answers are “Don’t know” which could be because the organization, or the person, responsible for individual projects in those cases does not have all the information on the projects they are managing. This issue needs to be analysed further to see if those projects have something in common.

5.3 Business Case

The status of the project business cases category are somewhat below average. Cost Benefit Analysis is relatively worst within the category and evaluation of feasibility of projects through comparison to alternatives is also below average of the category. The first assessment large Norwegian project go through seems especially well suited to address these problems.

What is also problematic for the category is the high ratio of “NA” and “Don’t know” answers, or more than double the average of all the other categories, almost evenly split between “NA” and “Don’t know”. That makes the results less reliable and needs to be analysed further.

Risk management is also lacking and will be discussed below in a chapter on risk management.

5.4 Project Management Office

The Project Management Office category gets the second lowest score and the second lowest relative compliance to best practice. That might be due to problems with the questions in this category. All the questions assume project management is performed through a special project management office which might not be the case in all instances. It is therefore not straightforward how to respond to the questions if project management office does not exist. That is also reflected in the data where the ratio of “not applicable” answers is 10% while the average in the rest of the categories is 6%, or almost double.

It is therefore not fully clear if those who materially answer the question have all project management office as the questions indicate, but that is nevertheless assumed.

The answers to the questions within the category do not indicate that any part of project management is relatively better or worse, indicating that all aspects of project management need to be improved. Some external assistance could be used in improving processes, but most likely improved quality of personnel handling project management is needed, either through education of current employees or hiring.

5.5 Risk Management

The Risk Management category receives the lowest scores of all the categories and the lowest relative compliance to best practice indicating it is the weakest aspect of public project governance in Iceland. The answers to the questions within the category do not indicate that any part of risk management is relatively better or worse, indicating that all aspects of risk management need to be improved.

Risk management requires specialized knowledge and in organizations where the management of risk is especially important, for example financial companies, considerable resources are being allocated to it. People with special knowledge of risk management have been hired and risk managers often wield considerable power.

Risk management requires knowledge which is not very common, including data analysis, modelling, and probability calculations. Building up such knowledge throughout the public sector where large projects exist would be expensive and time consuming. Therefore, external experts could assist, to begin with. The role such experts have in Norway could serve as a model, where they provide risk assessment services at two different times in the life cycle of projects and potential as external consultants throughout the life of larger projects. But in the long run, in addition, knowledge of and the use of risk assessment should be improved within the public sector, for example with specialized courses and seminars aimed at public servants responsible for project management.

5.6 Conclusion

This thesis focused on public project governance and examined its current state in Iceland. The findings from the study the thesis is based on suggest that while the situation is not entirely negative, there are several areas that require improvement. The Norwegian model has served as an example for other countries, as it has been successful in handling large projects. Iceland could consider implementing a similar model or undertaking other similar changes. However, the study is too small and not sufficient to serve as the basis for any costly actions. Therefore, further investigation is needed to fully assess the situation before taking additional measures. It is recommended to examine particularly those aspects that appear less favourable in order to confirm those results and gain deeper insight into them. Subsequently opportunities for improvement could be developed which could include further education of public officials responsible for project management, legislative changes (external audits), or organizational restructuring (a project management office).

First the aim was to answer the question: *How is project governance defined in the literature?* Based on the literature review, project governance refers to the framework and processes used to oversee and guide projects throughout their lifecycle. It defines roles, responsibilities, decision-making processes, and accountability within the organization. Effective governance ensures projects are completed efficiently, on time, within budget, and aligned with organizational strategic goals. Based on this, the question: *What characterizes good public project governance?* was introduced. The OECD has published recommendations to enhance public governance and investment across member countries. These recommendations emphasize the need for public investment strategies with clear objectives, localized approaches, and enhanced coordination to improve efficiency. Projects should be goal-oriented, assessed for long-term impacts and risks, and stakeholders should be engaged without undue influence from special interest groups. Market forces should be utilized when appropriate. Public sector competence must be secured, emphasizing transparency, quality assurance, and learning from experience. Additionally, sound financial management and accurate cost estimation are crucial to supporting effective investment.

Finally, the aim was to answer, *what are the strength and weaknesses of public project governance in Iceland?* This was conducted through a study on Icelandic public institutions. The survey was carried out by MSc students at Reykjavík University, who distributed it to various public institutions in Iceland. The survey was divided into seven categories, each related in some way to project governance. The findings revealed that the lowest-scoring categories were business case, project management office, and risk management, while the highest-performing category was projects and programs.

Overall, it was pleasantly surprising to find that public sector managers perceive their organizations as being well aligned with project governance best practices. Previous studies suggested a limited application or even absence of these practices, leading to expectations of a less favourable outcome. However, this study reveals the opposite, although there are variations in the quality across different project governance categories, indicating areas for improvement. The discrepancy between earlier research, which highlighted that Icelandic project governance lags international standards, and the positive findings of this study is noteworthy. The author, therefore, recommends additional research to validate these results. It may be beneficial to use alternative research methods, rather than online surveys, to gain a more accurate understanding of the actual state of project governance.

Bibliography

- [1] “Statistics Iceland: Government deficit at 2% of GDP in 2023,” Statistics Iceland. Accessed: Sep. 05, 2024. [Online]. Available: <https://statice.is/publications/news-archive/public-finance/general-government-finances-2023-provisional-estimates/>
- [2] H. Þ. Ingason, “1500 milljarðar á 20 árum til innviðaverkefna á Íslandi,” Heimildin. Accessed: Mar. 29, 2024. [Online]. Available: <https://heimildin.is/grein/21038/>
- [3] K. F. Samset, G. H. Volden, N. Olsson, and E. V. Kvalheim, *Governance schemes for major public investment projects: A comparative study of principles and practices in six countries*. Ex ante akademisk forlag, 2016. Accessed: Aug. 30, 2024. [Online]. Available: <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/2437545>
- [4] Þ. V. Friðgeirsson and H. V. Bragason, “Stjórnsmál eða stjórnsýsla? - Frumundirbúningur og ákvörðunartaka vegna opinbers verkefnis á Íslandi borið saman við norskar lágmarkskröfur,” *Icel. Rev. Polit. Adm.*, vol. 10, no. 1, Art. no. 1, Jun. 2014, doi: 10.13177/irpa.a.2014.10.1.2.
- [5] *A guide to the project management body of knowledge*, Fifth edition. Newtown Square , Pennsylvania: Project Management Institute, 2013.
- [6] M. Siems and O. S. Alvarez-Macotella, “The G20/OECD Principles of Corporate Governance 2015: A Critical Assessment of Their Operation and Impact,” Apr. 11, 2017, Rochester, NY: 3000329. Accessed: Aug. 29, 2024. [Online]. Available: <https://papers.ssrn.com/abstract=3000329>
- [7] K. F. Samset and G. H. Volden, *Investing for Impact. Lessons with the Norwegian State Project Model and the first investment projects that have been subjected to external quality assurance*. Ex Ante Akademisk forlag, 2013. Accessed: Aug. 30, 2024. [Online]. Available: <https://sintef.brage.unit.no/sintef-xmlui/handle/11250/2593608>
- [8] E. G. Too and P. Weaver, “The management of project management: A conceptual framework for project governance,” *Int. J. Proj. Manag.*, vol. 32, no. 8, pp. 1382–1394, Nov. 2014, doi: 10.1016/j.ijproman.2013.07.006.
- [9] H. T. Ingason, T. V. Friðgeirsson, S. M. Gunnlaugsdóttir, and E. Stefansdóttir, “A cross-national comparison of the project governance frameworks in two Nordic countries,” *Proj. Leadersh. Soc.*, vol. 3, p. 100075, Dec. 2022, doi: 10.1016/j.plas.2022.100075.
- [10] D. Levi-Faur, “From ‘Big Government’ to ‘Big Governance’?,” *Oxf. Handb. Gov.*, Jan. 2012, doi: 10.1093/oxfordhb/9780199560530.013.0001.
- [11] O. E. Williamson, “Transaction-Cost Economics: The Governance of Contractual Relations,” *J. Law Econ.*, vol. 22, no. 2, pp. 233–261, 1979.
- [12] G. Stoker, “Governance as theory: five propositions”.
- [13] R. Muller, *Project Governance*. Gower Publishing Limited, 2009.
- [14] “OECD Legal Instruments.” Accessed: Sep. 14, 2024. [Online]. Available: <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0402>
- [15] R. Freeman and J. Mcvea, “A Stakeholder Approach to Strategic Management,” *SSRN Electron. J.*, Jan. 2001, doi: 10.2139/ssrn.263511.

- [16] M. Ketokivi and J. T. Mahoney, "Transaction Cost Economics as a Theory of the Firm, Management, and Governance," in *Oxford Research Encyclopedia of Business and Management*, 2017. doi: 10.1093/acrefore/9780190224851.013.6.
- [17] S. Ross, "The Economic Theory of Agency: The Principal's Problem," *Am. Econ. Rev.*, vol. 63, pp. 134–39, Feb. 1973.
- [18] S. Agere, *Promoting Good Governance: Principles, Practices and Perspectives*. Commonwealth Secretariat, 2000.
- [19] A. ul Musawir, S. B. Abd-Karim, and M. S. Mohd-Danuri, "Project governance and its role in enabling organizational strategy implementation: A systematic literature review," *Int. J. Proj. Manag.*, vol. 38, no. 1, pp. 1–16, Jan. 2020, doi: 10.1016/j.ijproman.2019.09.007.
- [20] P. Weaver, "Director, Mosaic Project Services Pty Ltd," *Hong Kong*.
- [21] O. J. Klakegg and G. H. Volden, "8. Approaches to Governance in Public projects – The Norwegian Case".
- [22] M. Harwell, "Research Design in Qualitative/Quantitative/Mixed Methods," in *The SAGE Handbook for Research in Education: Pursuing Ideas as the Keystone of Exemplary Inquiry*, 2455 Teller Road, Thousand Oaks California 91320 United States: SAGE Publications, Inc., 2011, pp. 147–164. doi: 10.4135/9781483351377.n11.
- [23] Ž. Milenović, "APPLICATION OF MANN-WHITNEY U TEST IN RESEARCH OF PROFESSIONAL TRAINING OF PRIMARY SCHOOL TEACHERS," *Metod. Obz. Horiz.*, vol. 6, no. 1, pp. 73–79, Aug. 2011, doi: 10.32728/mo.06.1.2011.06.
- [24] M. Tushev, "Does my sample have to be normally distributed for a t-test?," Medium. Accessed: Sep. 19, 2024. [Online]. Available: <https://miroslavtushev.medium.com/does-my-sample-have-to-be-normally-distributed-for-a-t-test-7ee91aaca2a>
- [25] "The Ultimate Guide to T Tests - Graphpad." Accessed: Sep. 16, 2024. [Online]. Available: <https://www.graphpad.com/guides/the-ultimate-guide-to-t-tests>
- [26] T. K. Kim, "T test as a parametric statistic," *Korean J. Anesthesiol.*, vol. 68, no. 6, pp. 540–546, Nov. 2015, doi: 10.4097/kjae.2015.68.6.540.
- [27] J. Frost, "T Test Overview: How to Use & Examples," Statistics By Jim. Accessed: Sep. 16, 2024. [Online]. Available: <https://statisticsbyjim.com/hypothesis-testing/t-test/>
- [28] "Independent T-Test - An introduction to when to use this test and what are the variables required | Laerd Statistics." Accessed: Sep. 16, 2024. [Online]. Available: <https://statistics.laerd.com/statistical-guides/independent-t-test-statistical-guide.php>

Appendix

Questions

The questions for each topic are.

Strategic goals

1. The strategic goals for the projects within my organization are clear, specific, and unambiguous.
2. The strategic goals for the projects within my organization are measurable and quantified.
3. The strategic goals for the projects are realistic and attainable within the given resources and time frame.
4. The strategic goals for the projects within my organization have clear purpose and contribute to its long-term success.
5. The strategic goals for the projects within my organization have a defined timeframe or deadline.

Portfolios

1. The portfolio of projects within my organization do reflect the priorities and vision of the organization, ensuring that the projects collectively contribute to its overall success.
2. The portfolio of projects within my organization do assess and manage risks associated with individual projects and the portfolio as a whole.
3. The portfolio of projects within my organization shares resources, including personnel, finances, and technology to ensure efficient use and avoid conflicts and are aligned with project priorities and strategic goals.
4. The portfolio of projects within my organization has Key Performance Indicators (KPIs) that measure progress that are reported to the relevant stakeholders.
5. The portfolio of projects within my organization has a governance structure for the project portfolio including defining decision-making processes, roles and responsibilities, and accountability mechanisms.

Business case (BC)

1. Project Business Cases within my organization have clearly articulated problem/opportunity statement that the project aims to address.
2. Project Business Cases within my organization are based on a thorough cost-benefit analysis to assess the viability of the project.
3. Project Business Cases within my organization do identify potential risks and uncertainties associated with the project.
4. Project Business Cases within my organization do identify and analyze key stakeholders involved in or affected by the project by outlining their interests, concerns, and potential contributions.

5. Project Business Cases within my organization do assess the technical, operational, and organizational feasibility of the project and. explore and evaluates alternative solutions or approaches, including the "do-nothing" option.

Project management offices (PMO),

1. In our organization we have a project management office (or a function) that works closely with senior management to ensure that projects and programs align with the company's overall strategy.
2. In our organization we have a project management office (or a function) that is responsible for establishing and maintaining standardized project management processes and methodologies.
3. In our organization we have a project management office (or a function) that is involved in resource management, ensuring that the right resources are allocated to projects based on priority and strategic importance.
4. In our organization we have a project management office (or a function) that plays a critical role in monitoring and reporting on the performance of the projects to the key stakeholders.
5. In our organization we have a project management office (or a function) that is a vital part of the project governance by establishing frameworks for decision-making, project oversight, and risk management.

Programs and projects

1. In our organization projects have clear and measurable project objectives from the start.
2. In our organization projects have open and transparent communication channels among team members and stakeholders that communicate clearly roles, responsibilities, and expectations.
3. In our organization projects are developed with a detailed project plan that includes timelines, milestones, tasks, resource allocations and change management strategy.
4. In our organization project potential risks events that might impact the project are identified and mitigated, transferred or accepted as applicable.
5. In our organization key stakeholders are engaged early in the project., their expectations understood, and managed and positive relationship maintained throughout the project lifecycle.

Cost Benefit Analyze (CBA)

1. In our organization larger projects are costs are identified, for instance the initial investment costs, operational costs, maintenance costs, and any other relevant expenses both direct and indirect
2. In our organization larger projects, the benefits that will result from the project or decision are estimated in monetary values for instance, increased revenue, cost savings, improved efficiency, and intangible benefits such as enhanced reputation.
3. In our organization the time value of money is a key aspect of cost-benefit analysis for larger projects and future costs and benefits are typically discounted to their present value.
4. In our organization acknowledging uncertainties and risks is essential in cost-benefit analysis so analyzing the range of possible outcomes and considering risk factors allows is carried out to make more informed choices.

5. In our organization we consider social and intangible factors that might not be easily quantifiable. These factors could include environmental impacts, social welfare considerations, and non-market goods.

Risk management

1. In my organization the first step in the risk identification analysis is to identify potential risks that could impact the project or decision by systematically exploring and documenting risks related to various aspects such as project scope, resource allocation, technology, market conditions, regulatory changes, and external factors
2. In my organization after identifying potential risks, we to assess and evaluate them by analyzing the likelihood of each risk occurring and its potential impact on project objectives. Risk Mitigation and
3. In my organization we develop strategies for mitigating or responding to the risks by risk response plans that outline actions to reduce the probability or impact of risks. Risk Monitoring and Control:
4. In my organization risk management is an ongoing process that requires continuous monitoring of identified risks by tracking the status of risks, assessing changes in their likelihood or impact, and evaluating the effectiveness of implemented risk responses.
5. In my organization we explore different future scenarios and assessing how changes in variables might impact project outcomes by sensitivity analysis.

