DEPARTMENT OF ECONOMICS AND MANAGEMENT

Master Programme in International Business and Entrepreneurship

Tangible Practices in Innovation Management

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Academic Year 2023-2024

I would like to express my deepest gratitude to my supervisor, Prof. Dr. Denicolai, for his unwavering support and guidance throughout this research. His insightful feedback, particularly during the development of the literature review, and his thoughtful advice on structuring the overall thesis, were invaluable.

I am also immensely grateful to all the participants who generously contributed their time, effort, and knowledge. Their input provided crucial insights into innovation practices, which significantly enriched this study.

Finally, I would like to extend my thanks to my fellow students, family, and friends, whose encouragement and understanding were a constant source of motivation during this journey.

Abstract

This master's thesis explores key aspects of innovation management with a particular focus on the practical dimensions of organisational innovation. The study aims to identify the essential dimensions of organisational innovation and examine the practices that organisations use to foster innovation. A literature review was conducted to establish the fundamental dimensions of innovation, while interviews with industry professionals provided insights into the actual practices implemented in organisations.

Three essential dimensions of organisational innovation were identified: Idea Management, Innovation Governance, and Metrics. Idea Management involves phases such as idea generation, evaluation, experimentation, and project review, ensuring that only the most promising ideas are pursued. Innovation Governance encompasses roles, incentives, tools, and communication strategies that promote and manage innovation effectively. Metrics are critical for measuring the success of innovation initiatives, combining objective and subjective indicators to offer a comprehensive assessment of innovation performance. The thesis highlights the importance of systematically integrating these dimensions into the innovation process to enhance an organisation's innovative capabilities. It concludes that a balanced approach to measuring innovation success, incorporating both quantitative and qualitative metrics, is essential for achieving long-term innovation goals. This research contributes to the field of innovation management by providing practical insights and a framework that can be applied across industries. Future research could expand the data pool to validate the findings, considering variables such as company size, industry, and cultural context.

Astratto

Questa tesi di master esplora gli aspetti chiave della gestione dell'innovazione, con particolare attenzione alle dimensioni pratiche dell'innovazione organizzativa. Lo studio mira a identificare le dimensioni essenziali dell'innovazione organizzativa e a esaminare le pratiche che le organizzazioni utilizzano per promuovere l'innovazione. È stata condotta una revisione della letteratura per stabilire le dimensioni fondamentali dell'innovazione, mentre le interviste con i professionisti del settore hanno fornito approfondimenti sulle pratiche effettive attuate nelle organizzazioni.

Sono state identificate tre dimensioni essenziali dell'innovazione organizzativa: Gestione delle idee, Governance dell'innovazione e Metriche. La gestione delle idee comprende fasi quali la generazione delle idee, la valutazione, la sperimentazione e la revisione dei progetti, garantendo che vengano perseguite solo le idee più promettenti. La governance dell'innovazione comprende ruoli, incentivi, strumenti e strategie di comunicazione che promuovono e gestiscono efficacemente l'innovazione. Le metriche sono fondamentali per misurare il successo delle iniziative di innovazione, combinando indicatori oggettivi e soggettivi per offrire una valutazione completa delle prestazioni dell'innovazione. La tesi evidenzia l'importanza di integrare sistematicamente queste dimensioni nel processo di innovazione per migliorare le capacità innovative di un'organizzazione. Si conclude che un approccio equilibrato alla misurazione del successo dell'innovazione, che incorpori metriche sia quantitative che qualitative, è essenziale per raggiungere gli obiettivi di innovazione a lungo termine. Questa ricerca contribuisce al campo della gestione dell'innovazione fornendo spunti pratici e un quadro di riferimento che può essere applicato a tutti i settori. La ricerca futura potrebbe ampliare il pool di dati per convalidare i risultati, considerando variabili come le dimensioni dell'azienda, il settore e il contesto culturale.

Table of contents

List of Figures

List of Tables

1. Introduction

Innovation can be broadly defined as the process of translating ideas into goods or services that create value for which customers will pay (Baregheh et al., 2009). It involves the deliberate application of information, imagination, and initiative to derive greater or different values from resources (Crossan & Apaydin, 2010) and includes all processes by which new ideas are generated and converted into useful products (Tidd & Bessant, 2009). According to Baregheh et al. (2009), innovation is often seen as a multidimensional concept encompassing creativity, technology, design, and business strategy, each contributing to the overall innovative capability of an organisation.

Innovation is critical for economic growth and competitive advantage (Zhou et al., 2005). It allows companies to respond to external changes, such as technological advancements and shifting market demands, ensuring their long-term survival and success (Zhou et al., 2021). Through innovation, companies can create new products (Utterback, 1996), improve existing ones (Christensen & Raynor, 2013), streamline processes (Hammer & Champy, 2009), and explore new business models (Teece, 2010), thereby driving both operational efficiency and market differentiation (Porter, 1996).

Innovation stands as a vital element for enterprise development and competition, serving as a driving force for long-term economic growth (Zhou et al., 2021). Crafting innovative products within the industrial environment presents a complex challenge (Trott, 2017). While it is imperative to project the organisation's long-term growth, there exists constant pressure to optimise current operations (Khan & Mir, 2019; Sarkees & Hulland, 2009). This continual push for operational refinement within the context of the industry can potentially impede creativity and innovation if not appropriately balanced (Perez-freije & Enkel, 2007).

Historically, the concept of innovation has evolved significantly (Bogers et al., 2018). In the early industrial era, innovation was primarily associated with incremental product improvements (Dodgson et al., 2013). Over time, with the advent of new technologies and the increasing pace of change, the focus shifted towards more radical innovations, encompassing not just products but also processes (Garud et al., 2018), business models (Foss & Saebi, 2016), and organisational structures (Vaccaro et al., 2012). The modern view of innovation embraces a holistic approach, recognising the need for organisations to be innovative in all aspects of their operations, from R&D to marketing and beyond (Crossan & Apaydin, 2010).

While the fundamental principles of innovation remain consistent, its application can vary significantly across sectors. In the technology sector, for example, innovation is often synonymous with breakthrough inventions and disruptive technologies (Koppman & Leahey, 2019). In contrast, sectors like agriculture or manufacturing may prioritise incremental innovations that enhance productivity and sustainability (Klerkx et al., 2019). This sectoral variability underscores the importance of contextualising innovation practices within the specific industry environment (Snyder & Duarte, 2008).

Despite the recognised importance of innovation, implementing effective innovation practices remains a significant challenge for many organisations (Crossan & Apaydin, 2010). Factors such as organisational culture (Schein, 2004), resource allocation (Barney & Clark, 2007), risk management (Hopkin, 2018), and the alignment of innovation with business strategy (Pisano, 2015) can all influence the success of innovation initiatives (Chesbrough & Bogers, 2014). Moreover, the complexity of modern business environments means that organisations must continuously adapt their innovation strategies to stay competitive, which can be particularly challenging in sectors with long product development cycles or highly regulated environments (Robertson & Jacobson, 2011).

This master's thesis explores these challenges in detail, examining how different sectors approach innovation and identifying best practices that can be applied across industries.

Organisations that fail to innovate risk losing their competitive edge and market position. While many recognise the importance of innovation, there is often a gap between recognising its importance and effectively implementing it within the organisation (Birkinshaw & Gibson, 2004). Ruvio et al. (2013) have identified five dimensions of organisational innovation: creativity, openness, future orientation, risk-taking, and proactivity. These dimensions have been extensively researched (Amoroso et al., 2021; Astola et al., 2022; Brege & Kindstrom, 2020). However, practical strategies and tangible practices to cultivate these dimensions within an organisation have not been studied as much (Gregersen et al., 2009). To successfully foster these intangible dimensions, tangible practices must be implemented to guide the organisation towards these objectives. This master's thesis explores various approaches to implementing strategies and practices aimed at realising innovation within a company.

The following research questions guide this master's thesis:

- RQ1: What are the key dimensions of organisational innovation, and how do they impact overall business success?
- RQ2: What innovation practices are currently utilised by organisations, and which additional practices could be implemented to enhance innovation?
- RQ3: How can the success of innovation initiatives be effectively measured and assessed within organisations?

These questions aim to address the critical aspects of innovation management and provide actionable insights that can be applied across different sectors.

The research conducted in this study aims to identify best practices in innovation management and governance across various sectors and to develop a framework for assessing the success of innovation initiatives based on qualitative and quantitative metrics. By achieving these objectives, the study seeks to contribute to the existing body of knowledge on innovation management and offer practical recommendations for organisations aiming to enhance their innovative capabilities.

The scope of this study includes an extensive literature review and empirical research conducted through interviews with industry professionals across different sectors. The study focuses on medium to large organisations within the automotive, logistics, municipal administration, information technology, construction, and agricultural sectors. The empirical research is designed to capture a wide range of perspectives on innovation practices, with an emphasis on identifying sector-specific challenges and opportunities.

The findings of this research provide valuable insights and practical recommendations for organisations looking to further develop their innovation capabilities.

This study contributes to the existing body of knowledge in innovation management by outlining concrete, practice-oriented structures and strategies that can be applied across industries. Future research could focus on refining these approaches and examining their application in specific industries or under particular market conditions.

This research is based on several key assumptions: Participants in the study are assumed to provide honest and accurate responses during interviews. Additionally, the practices and challenges identified in the study are representative of broader industry trends. However, the study is subject to certain limitations: The sample size of interview participants, while diverse, may not fully capture the variability of innovation practices across all industries. Moreover, the focus on specific sectors may limit the generalisability of the findings to other industries.

This thesis is structured as follows: Chapter 2 provides an overview of the existing research on organisational innovation, identifying key themes and gaps in the literature. This literature review draws on both scientific and grey literature. By combining academic research with practical insights from industry reports and other non-peer-reviewed sources, this study aims to provide a well-rounded understanding of innovation management across different sectors. Chapter 3 outlines the methodology used for the research while chapter 4 includes the research design, sampling methods, and data collection techniques in this study. Chapter 4 also presents the findings from the empirical research which is a detailed analysis of the interview data. Chapter 5 interprets the results in the context of the existing literature, discusses their implications. Chapter 6 contains a final conclusion of the main findings of this study, as well as offers recommendations for future research. Lastly, the End Matter includes references and appendices that provide additional context and supporting materials.

2. Literature review

A comprehensive overview of the current research and theoretical perspectives related to innovation management is the primary purpose of this literature review, with a particular focus on Idea Management, Innovation Governance, and Metrics. These areas have been identified as critical to understanding how organisations can effectively foster innovation and maintain a competitive edge.

This literature review is structured into three main sections. The first section delves into the concept of Idea Management, which is further divided into three key areas: Idea Generation, Selection, Evaluation, and Rejection; Experimentation, Execution, and Adaptation; and Project Review. This section explores how organisations manage the lifecycle of ideas, from their inception to their potential implementation or rejection, highlighting the critical processes and decision points involved.

In the second section, Innovation Governance is examined, focusing on the organisational roles, incentives, and communication strategies that support innovation. It also looks at the tools and methods employed to govern innovation processes effectively.

Finally, the last section addresses the various metrics used to measure innovation success, providing insights into the effectiveness of different approaches and their applicability in various organisational contexts.

Selected literature for this review includes both scientific and grey literature, ensuring a broad perspective that encompasses both theoretical foundations and practical applications. The analysis will highlight key trends, identify gaps in the current research, and propose areas for further investigation.

Overall, this literature review aims to lay the groundwork for the subsequent empirical research, providing a solid theoretical basis for exploring how different sectors approach innovation and identifying best practices that can be applied across industries.

2.1. Idea Management

Idea management represents a strategic framework encompassing a spectrum of practices aimed at harnessing and disseminating the untapped potential of ideas originating from the collective intellect of employees and partners within an organisation. The essence of idea management lies in its ability to transform abstract concepts lingering “in the air” into tangible and actionable initiatives. This multifaceted approach unfolds through a series of interconnected sub-practices, each playing a pivotal role in the ideation lifecycle. This literature review delves into the dynamic landscape of idea management, exploring its nuances through a lens focused on three primary sub-chapters:

- Idea Generation, Mapping, Evaluation, and Rejection
- Experimentation, Execution, and Adaptation
- Project Review

2.1.1. Idea Generation, Mapping, Evaluation, and Rejection

The initial stage of innovation encompasses the generation of novel ideas (Sukhov et al., 2021). Effective implementation of these ideas is crucial for successful innovation, as it determines both the quality and quantity of ideas that are meticulously chosen, developed, and diffused in successive stages (Moon & Han, 2016; Tidd & Bessant, 2009). Idea generation is inherently creativity-intensive and unstructured (Christiansen & Gasparin, 2016; Perry-Smith & Mannucci, 2017), as decisions in this stage are often made amidst significant uncertainty (Zhou et al., 2021). The idea generation stage has been scrutinised at various levels: procedurally (Neukam, 2017), at both individual and team levels (Kock et al., 2015), and with a focus on particular industries and products (Eling & Herstatt, 2017). The literature offers a variety of instruments to stimulate idea generation. Conventional approaches such as empathetic design (Mcdonagh, 2004), qualitative interviews (King et al., 2018), user workshops (Baird, 2020), and "innovation garages" (de Jong et al., 2015) are prevalent. Traditional, non-digital tools have been augmented by digital counterparts that promote virtual idea generation (Rietzschel et al., 2019, p. 291; Zhang et al., 2012). For example, corporate online ideation platforms (Kruft et al., 2019), innovation communities (Lim & Ong, 2019), competitions, and crowdsourcing (Sakamoto & Bao, 2011; Schweitzer et al., 2013) all facilitate the generation of ideas.

Idea mapping involves effectively structuring and brainstorming ideas, utilising visual aids to organise and understand complex information. This process often includes the use of words, images, colours, and numbers to highlight ideas and draw connections (Colman, 2016). Various tools, both digital and physical, support individuals in mapping their ideas. For instance, MURAL, a virtual whiteboard tool, allows for anonymous idea sharing, making it a valuable

resource for remote teams (Tsipursky, 2022). Virtual brainstorming offers several advantages over traditional in-person techniques. Firstly, it eliminates production blocking, enabling participants to contribute ideas simultaneously without the fear of disrupting others (Nijstad et al., 2003). Production blocking typically occurs when individuals hesitate to share ideas due to concerns about group etiquette or interrupting the flow of discussion (DeRosa et al., 2007). Secondly, virtual platforms create a persistent space where ideas can be stored and revisited, allowing for continuous improvement and expansion (Gallupe et al., 1994). Lastly, the anonymity provided by virtual tools reduces evaluation apprehension, further enhancing idea sharing and generation (Cooper et al., 1998). In addition to brainstorming techniques, Idea Mapping involves the use of analytical tools such as SWOT analysis, PESTLE analysis, and BACHA analysis to gain valuable insights into external and internal factors influencing innovative initiatives (Bouhali et al., 2015). These tools are crucial for structuring ideas and evaluating their potential impact. Additionally, a governance process becomes crucial for assessing the expected value, timing, and risk of initiatives, along with determining their overall composition (de Jong et al., 2015). A structured approach to problem-solving begins with defining the function and ends with creating a structure that supports the implementation of innovative ideas (Zhang et al., 2012).

After generating and organising ideas, it is essential to evaluate them thoroughly to pinpoint and prioritise the most promising ones for further refinement and eventual implementation or pursuit as actual products, using ranking and prioritisation techniques (Sakamoto & Bao, 2011). Idea evaluation is a crucial aspect of the creative process employed by organisations to assess the quality (Tague, 2023), risks (Schmeisser et al., 2010), and feasibility (Reiter-Palmon & Hunter, 2023) of the ideas they generate. Idea evaluation involves the recognition of creative

ideas as well as the appreciation of them (Paulus & Nijstad, 2019), while idea selection pertains to the identification of the most creative and impactful ones (Rietzschel et al., 2019). Depending on the nature of the idea – whether it is incremental, evolutionary, or revolutionary – and the context of the company, project, or product, various methods for evaluating ideas may be employed (Mendes, 2024). One approach to idea selection involves utilising the Idea Evaluation Matrix. This method entails selecting criteria such as time, cost, and monetary impact to evaluate each idea and establishing a criteria coefficient for each one to calculate a weighted rating (Bureau, 2020). Evaluation and selection can happen individually, but they often occur in group settings (de Buisonjé et al., 2017; Rietzschel et al., 2019).

Idea Rejection is a critical phase in the idea management process, recognising that not all generated ideas can or should be implemented (Van Dijk & van den Ende, 2002). The reasons for rejecting ideas are varied and can include resource constraints (Caniëls & Rietzschel, 2015), strategic misalignment (Slagmulder, 1997), high risk (McNally et al., 2010), or technological challenges (Juma, 2016). Decision-making processes in this phase often involve multiple stakeholders, including executives and innovation teams, who apply specific criteria to determine whether an idea aligns with the organisation's goals and capabilities (Amabile & Mukti, 2008; McNally et al., 2011). The rejection of ideas can have significant psychological effects on employees, potentially leading to decreased motivation and creativity. Research suggests that how rejection is communicated plays a crucial role in mitigating these effects (Baer, 2012). Additionally, Baer (2012) argues that organisations must adopt strategies to communicate rejections constructively, ensuring that employees understand the rationale behind the decision and feel encouraged to continue contributing ideas. Moreover, organisations can benefit from documenting rejected ideas and periodically revisiting them

(Kijkuit & Van Den Ende, 2007). This approach allows for continuous learning and improvement, as some ideas may become viable under different circumstances or with technological advancements (Mascareño et al., 2021). Moreover, Mascareño et al. (2021) find that by creating a feedback loop where rejected ideas are analysed and lessons are extracted, companies can refine their innovation processes and enhance their overall innovation capabilities.

The effective management of ideas is essential for driving innovation within organisations. This subchapter explored the various stages of Idea Management, from the initial generation of ideas through mapping, evaluation, and ultimately, rejection. The process of generating ideas is inherently creative and often unstructured, but with the right tools and methodologies, such as SWOT analysis and virtual brainstorming platforms, organisations can better structure and refine these ideas. The evaluation of ideas is crucial in determining their feasibility, risks, and potential impact, ensuring that only the most promising ideas move forward. Although, not all ideas can or should be implemented, and the rejection of ideas is an equally critical part of the process. Effective communication and documentation of rejected ideas, along with the implementation of feedback loops, allow organisations to learn from these decisions and continuously improve their innovation processes. By strategically managing each stage of the idea lifecycle, organisations can enhance their capacity to innovate and adapt to an ever-changing business environment.

2.1.2. Experimentation, Execution, and Adaption

This subchapter examines the opportunities and strategies for enhancing organisational agility, along with the methods to achieve this. Agility, defined as the ability of an organisation to rapidly respond to changes and uncertainties in its environment, is increasingly seen as essential for managing innovation in today's fast-paced business landscape (Salo, 2017). Agile organisations are characterised by their flexibility, speed, and resilience, allowing them to adapt quickly to new challenges and opportunities (Rigby et al., 2018). Transforming towards a more agile organisation is frequently discussed as agile ways of working promise to make companies more resilient and future-proof (Denning, 2018). Achieving greater agility can be accomplished through various approaches that will be discussed in this subchapter. These include defining the term ‘agility’ and analysing the characteristics and capabilities associated with it, exploring different frameworks for implementing agility within an organisation, and examining the processes of testing and adapting ideas through experimentation. Lastly, the key success factors for testing, experimenting, and adapting within agile frameworks will be discussed.

Becoming an agile organisation involves adopting a mindset and processes that allow for rapid adaptation to changes in the environment (Dikert et al., 2016). Agility is not just about speed, but also about flexibility and resilience (Birkinshaw & Gibson, 2004). Key characteristics of an agile organisation include:

- *Flexibility*: The ability to reconfigure resources and processes quickly in response to changing market conditions (Teece et al., 2016).
- *Speed*: The capability to implement changes rapidly, often through iterative processes that allow for quick feedback and adjustments (Highsmith, 2009).
- *Resilience*: The strength to withstand disruptions and bounce back from setbacks, ensuring long-term sustainability (PwC, n.d.).

To achieve this, organisations can adopt various frameworks such as Scrum, Kanban, Lean, and SAFe.

Scrum is a framework that helps teams work together by encouraging them to learn through experiences (Schwaber & Sutherland, 2017), self-organise while working on a problem (Hoda & Noble, 2017), and reflect on their wins and losses to continuously improve (Cohn, 2010). It is particularly popular in software development but has also found application in other fields due to its iterative approach, which allows for continuous feedback and adjustment (Rubin, 2012). The advantages of Scrum include increased transparency (Simschek & Kaiser, 2019), improved team collaboration (Paasivaara et al., 2018), and faster delivery of incremental improvements (Sutherland & Sutherland, 2014). However, challenges can arise from its strict adherence to roles and ceremonies, which may not suit all teams or projects, especially in more hierarchical organisations (Bass, 2014).

Kanban is another agile framework that uses a visual approach to manage workflow as it moves through a process (Bartel, 2023). It is designed to help teams visualise their work (Anderson & Bozheva, 2021), maximise efficiency (Leopold, 2016), and continuously improve (Salimi, n.d.). Unlike Scrum, Kanban does not prescribe specific roles or phases but instead focuses on workflow and continuous delivery (Epping, 2011). This flexibility makes it easier to implement in various organisational contexts, but it can also lead to challenges in maintaining discipline and ensuring that work-in-progress limits are respected (Kiiskinen, n.d.). The key benefits of Kanban include improved workflow management and the ability to adapt quickly to changes (Brereton, 2022), while potential difficulties involve the need for strong self-management within teams (Anderson, 2010).

The **Lean methodology** focuses on creating more value for customers with fewer resources by eliminating waste (Liker, 2004), improving quality (Bhasin, 2015), and delivering faster (Womack & Jones, 2010). Lean principles emphasise optimising processes and minimising non-value-adding activities (Melton, 2005), which can lead to significant efficiency gains and cost savings (Piercy & Rich, 2009). On the contrary, implementing Lean can be challenging, as it often requires a cultural shift within the organisation, demanding a high level of commitment from all employees (Protzman et al., 2022). The main advantages of Lean include its focus on efficiency and continuous improvement (Shah & Ward, 2003), while potential obstacles include resistance to change and the difficulty of maintaining long-term commitment (Bhasin, 2012; Protzman et al., 2022).

The **Scaled Agile Framework (SAFe)** is a comprehensive framework for scaling Agile practices across the entire organisation (Patel, 2024). It provides a structured approach to coordinating multiple teams and aligning them with the organisation's strategic goals (Knaster & Leffingwell, 2020). SAFe is particularly beneficial for large organisations that need to scale Agile practices beyond individual teams (Leffingwell, 2018). The advantages of SAFe include its ability to manage complexity (Malik, 2024) and its increase in productivity (Scaled Agile, n.d.). However, it can be complex to implement and requires substantial training and change management efforts to be effective (Leffingwell et al., 2018; Rupp & Singh, 2020).

Introducing these agile frameworks typically involves several key steps: providing comprehensive training (Dikert et al., 2016), starting with pilot projects (Vazanias, n.d.), and scaling successful practices across the organisation (Kniberg & Ivarsson, 2012). For instance, companies like Spotify have successfully implemented agile methodologies by starting with small teams and gradually expanding the approach organisation-wide (Kniberg & Ivarsson, 2012). Despite the advantages, the implementation of these frameworks can encounter

challenges such as resistance to change, the need for ongoing training, and the difficulty of maintaining consistent practices across diverse teams.

Setting up and running an experiment is a crucial part of the innovation process, enabling organisations to test hypotheses and gather data before fully committing to a new idea (Thomke, 2020). The process begins by identifying the problem or hypothesis that needs validation (Blank et al., 2012; Ripsas, 2020). Next, the organisation must choose the appropriate method for experimentation, such as A/B testing, creating a Minimum Viable Product (MVP), developing a prototype, or applying Design Thinking principles. These methods will be explained in the following paragraphs.

Design Thinking is a user-centred approach to innovation that focuses on understanding the needs of end users, prototyping ideas, and iterating solutions based on feedback (Razzouk & Shute, 2012). This methodology encourages a deep empathy with the users' needs (McDonagh, 2010), collaborative ideation (Lee et al., 2020), and hands-on prototyping to explore creative solutions (Brown, 2009). The advantage of Design Thinking lies in its emphasis on understanding the problem from the user's perspective, which often leads to more innovative and user-friendly solutions (Martin, 2009). Although, one of the challenges in implementing Design Thinking is that it requires a cultural shift towards embracing uncertainty and experimenting with unconventional ideas, which may not always align with traditional business practices (Johansson-Sköldberg et al., 2013).

A/B Testing, also known as split testing, is a method of comparing two versions of a webpage, product, or feature to determine which one performs better (Kohavi & Longbotham, 2017). This type of testing is frequently used in digital marketing and product development to optimise user experience and outcomes (Ascarza, 2018). The primary advantage of A/B testing

is its ability to provide clear, data-driven insights into what works and what does not, allowing for incremental improvements (Deng et al., 2013). However, A/B testing can be limited by its narrow focus, as it typically tests only one variable at a time, which might not capture the full complexity of user interactions (Siroker, 2013).

Prototyping involves creating a preliminary model of a product to test and validate ideas (Ulrich & Eppinger, 2011). Prototypes can range from simple sketches or mock-ups to fully functional models, depending on the stage of development (Schrage, 2000). The goal is to identify potential issues and make necessary adjustments before full-scale production (Wheelwright & Clark, 1992). Prototyping is particularly advantageous because it allows teams to explore ideas and iterate quickly, reducing the risk of costly errors later in the development process (Thomke, 2020). Although, prototyping can be resource-intensive, requiring time and materials that may not always be available, especially in smaller organisations (Cooper, 2011).

Pilot Projects are small-scale, preliminary studies conducted to evaluate feasibility (van Teijlingen & Hundley, 2001), time (Thabane et al., 2010), cost (Lancaster et al., 2004), and risks (Eldridge et al., 2016), and improve upon the design of a future full-scale project (Arain et al., 2010). Pilots are often used to test and refine new ideas or processes before broader implementation (Tashakkori & Teddlie, 2021). The advantage of pilot projects is their ability to provide real-world insights without the full commitment of resources required for a full-scale rollout (Rohrschneider, 2023). On the contrary, pilot projects can sometimes fail to replicate the complexities of a larger implementation, leading to unexpected challenges when scaling up (Moore et al., 2015).

The **Minimum Viable Product (MVP)** is a key concept within the Lean Startup methodology, designed to facilitate the rapid development and testing of a product with minimal resources (Schlopsna, 2024). The MVP approach allows organisations to create a simplified

version of a product that still delivers essential value to customers, enabling them to gather early feedback and make informed decisions regarding further development (Brereton, 2021). This strategy is particularly cost-effective, making it ideal for startups and small businesses that need to conserve resources (Ries, 2011). Additionally, by focusing on core functionalities, companies can reduce the risk associated with launching a new product, especially in uncertain markets (Blank, 2013). However, the simplicity of an MVP can sometimes result in negative customer perceptions if critical features are absent or if the product does not fully meet expectations (Maurya, 2022). Furthermore, while MVPs are effective for initial testing, they may encounter scalability issues, necessitating significant rework when scaling up to a full product (Neacsu, 2024). There is also the risk that an MVP might not adequately represent the final product's vision, potentially leading to misalignment in customer expectations (Ries, 2011).

After setting up the experiment, it is essential to systematically collect and analyse data to make informed decisions about the next steps. For example, Amazon uses A/B testing extensively to optimise customer experience before implementing changes across its platform (Thomke, 2020). Although, the success of any experiment depends heavily on the clarity of the hypothesis (Patton, 2023), the selection of appropriate metrics (Farris et al., 2010), and the ability to iterate quickly based on the results (Croll & Yoskovitz, 2013).

In summary, experimentation and agile execution are critical for fostering innovation within organisations. By becoming more agile, setting up and running effective experiments, and leveraging tools like MVPs, organisations can better navigate the complexities of modern business environments. These strategies not only reduce risks but also enable organisations to respond more quickly to changing market demands and technological advancements. However,

it is crucial to be aware of the challenges associated with implementing these frameworks and experimentation methods, including the need for cultural change, resource constraints, and the complexities of scaling successful practices.

2.1.3. Project Review

Innovation projects are essential for the growth and sustainability of any organisation, serving as the driving force behind competitive advantage and long-term success (Tidd & Bessant, 2009). However, the inherent risks and uncertainties associated with these projects mean that not all of them will succeed (Loch et al., 2011). When innovation projects fail, the consequences can be severe, potentially threatening the very survival of an organisation (Szatmari et al., 2021). Beyond the immediate financial losses – often amounting to millions of dollars in unrecoverable investments (Marwa & Zairi, 2008) – failed projects also erode employee morale, hinder learning, stifle entrepreneurial thinking, and discourage risk-taking (Edmondson, 2011). These factors collectively undermine the culture of innovation that is essential for long-term success (Shepherd & Cardon, 2009). To mitigate these risks and ensure continuous improvement, a systematic approach to reviewing completed projects is crucial. This chapter explores the importance of project reviews, discusses best practices, modern tools, and cultural considerations, and highlights how organisations can leverage these reviews to enhance future innovation efforts by learning from both successes and failures.

The high incidence of failure in innovation projects is often attributed to the substantial uncertainty inherent in these initiatives (García-Quevedo et al., 2018; Laine et al., 2016). With failure rates reported to be as high as 40 to 90% (Castellion & Markham, 2013; Heidenreich & Kraemer, 2016; Santos et al., 2014), it is crucial for organisations to employ a reflective approach that scrutinises past outcomes to understand where expectations were not met. This 'backward-looking strategy' (Greve, 2003) involves a detailed analysis of the factors leading to success or failure, thereby enabling organisations to learn from these experiences and reduce the inherent uncertainty in future projects.

To facilitate effective introspection, the concept of Learning from Experience Deficiency (LDEF) has been developed, which involves organisations systematically reflecting on past problems and errors, interpreting the underlying causes, and determining the necessary actions to improve future outcomes (Greve, 2003). By capturing and integrating lessons learned from both successes and failures, organisations can develop a more forward-looking strategy that better navigates the inherent uncertainties of innovation projects (de Jong et al., 2015). Additionally, trust within top management teams is essential, as it enables open discussions about failures and supports collective learning (Carmeli et al., 2012).

A project review is a critical tool for organisations to extract and leverage insights from completed projects or specific project phases, ultimately enhancing future initiatives (Spahn, n.d.). Before initiating a project review, it is essential to clearly define the topics to be discussed, as this will guide the selection of the most relevant participants (Schenkel, 2019; Walker, 2015). The benefits of conducting a thorough project review are manifold:

1. *Learning Outcomes*: Clarifies and documents the lessons learned from previous projects, ensuring that these insights are proactively applied to future endeavours (Wrike Team, 2024).
2. *Team Motivation*: Boosts team morale by acknowledging achievements and identifying areas for improvement, which are then systematically addressed (Schilling, 2022).
3. *Project Efficiency*: Enhances overall project efficiency by addressing obstacles and refining processes, thus leading to better outcomes in future projects (Nägele, 2019).

A project review is not just a retrospective exercise; it serves as a vital opportunity to gather valuable insights that can enhance future projects (Pinto, 2019). To maximise the benefits of a project review, several best practices should be observed. First and foremost, it is essential to include all relevant stakeholders in the review process (Dalkir et al., 2014). This means not only involving the project team but also engaging external stakeholders and, where appropriate, customers. By incorporating these diverse perspectives, the review can provide a more comprehensive understanding of the project's outcomes, helping to avoid blind spots and uncovering insights that might otherwise be missed. The documentation and follow-up of the review's findings are equally important. It is not enough to simply record the outcomes; these results must be actively integrated into future projects (Barthold & Giva Authorship Team, n.d.). Effective follow-up ensures that the identified actions are implemented and monitored, thereby embedding the lessons learned into the organisation's ongoing processes.

Moreover, fostering an environment where constructive feedback is encouraged and welcomed is essential for a successful project review (Cannon & Edmondson, 2005). This approach promotes a culture of continuous learning and improvement, where team members feel safe to share their thoughts and experiences, leading to more meaningful discussions and actionable outcomes (Edmondson, 2018).

In today's digital world, there are numerous tools and methods that can support the project review process (Rutherford, 2024). Software platforms like JIRA (Atlassian, n.d.), and Trello (Trello, n.d.) enable teams to systematically capture lessons learned, organise follow-up actions, and document the results of the review in a structured manner. These tools often integrate seamlessly with other project management software, making it easier to track tasks and responsibilities and ensuring that nothing falls through the cracks.

With the rise of remote work, virtual project reviews have also become an increasingly effective method (Li et al., 2023). They offer flexibility and allow international teams to participate, making it easier to bring together diverse perspectives (Neeley, 2015; Peters, 2023). Although, it is important to plan these virtual sessions carefully to ensure that all participants remain actively engaged throughout the process.

The role of organisational culture in project reviews is a critical factor that cannot be overlooked. In some organisations, a "blame culture" can significantly hinder the effectiveness of a review, as it creates an atmosphere of fear and defensiveness (Cannon & Edmondson, 2005). In contrast, an open and learning-oriented culture can greatly enhance the benefits of the review process, fostering a more productive and insightful discussion (Edmondson, 2018).

One of the key cultural considerations is the concept of psychological safety (Edmondson & Lei, 2014). It is crucial to establish an environment where team members feel safe to discuss mistakes openly, without fear of negative consequences (Cannon & Edmondson, 2005). This sense of security encourages honesty and transparency, which are essential for effectively learning from failures (DeChurch & Mesmer-Magnus, 2010). When individuals are confident that their contributions will not lead to blame or punishment, they are more likely to share valuable insights that can drive organisational improvement (Katzenbach & Smith, 2015).

Additionally, in international or multicultural teams, varying attitudes towards failure and learning can pose challenges during the project review process (Hofstede, 2001). Cultural differences can influence how team members perceive mistakes and how willing they are to discuss them openly (Meyer, 2016). It is important to acknowledge these differences and to facilitate a dialogue that respects and incorporates diverse perspectives. By doing so,

organisations can ensure that the review process is inclusive and that all voices are heard, leading to a more comprehensive and balanced understanding of the project's outcomes.

In conclusion, project reviews are a vital component of the innovation process, providing organisations with the opportunity to learn from both successes and failures. By systematically analysing completed projects and incorporating best practices such as timely reviews, stakeholder engagement, and thorough documentation, organisations can continuously improve their processes. Additionally, the integration of modern tools and a supportive organisational culture can further enhance the effectiveness of project reviews. By combining internal reflections with lessons learned from other organisations, companies can build a more robust and adaptive innovation process that not only mitigates risks but also fosters a culture of continuous learning and adaptability.

2.2. Innovation Governance

Innovation Governance refers to the strategic and systematic management of innovation processes, structures, and culture within an organisation. It is crucial for aligning innovation activities with overarching business objectives, ensuring that these activities are managed effectively and efficiently to secure the long-term success of the organisation. Innovation Governance encompasses the development of incentive systems, the design of internal and external communication strategies, the application of specific methodologies, and the allocation of clearly defined roles within the innovation process.

The significance of Innovation Governance lies in its ability to fully leverage an organisation's innovation potential by balancing creative freedom with structural control. Companies often face the challenge of aligning innovative ideas with existing business processes without losing the flexibility and agility necessary for innovation.

Despite the central role that Innovation Governance plays, its implementation remains complex. Organisations must not only create the right incentives but also ensure that communication is clear and effective, and that the methods and processes used to foster innovation are practically viable. Different industries and types of organisations benefit from Innovation Governance in varying ways, highlighting its adaptability and flexibility in application.

This introduction sets the foundation for a deeper exploration of the key components of Innovation Governance and demonstrates how they interact to promote a culture of continuous innovation, while ensuring that these innovations align with corporate objectives and stakeholder interests.

2.2.1. Incentives

In today's rapidly changing business environment, innovation is essential for organisational growth and maintaining a competitive edge. However, the ability to consistently innovate requires more than just a creative workforce; it demands a deliberate strategy that aligns the organisation's goals with the actions and motivations of its employees. Central to this strategy is the concept of incentives – mechanisms that serve as powerful levers to shape behaviour, drive commitment, and encourage innovative outcomes.

Incentives play a pivotal role in fostering a culture where creativity and risk-taking are not only permitted but actively encouraged (Amabile, 1998). Whether through financial rewards or non-financial recognition, well-crafted incentive systems balance the need for creativity and experimentation with the organisation's requirements for structure and accountability (Deci & Ryan, 2000). By aligning personal motivations with organisational objectives, these systems ensure that employees are not only motivated to engage in innovative activities but also committed to sustaining these efforts in a way that supports long-term business goals (Osterloh & Frey, 2000).

This subchapter explores the different types of incentives that organisations can employ to stimulate innovation. It examines both financial and non-financial incentives, highlighting their respective advantages and challenges. By understanding how various incentive structures impact innovation, organisations can better design systems that promote sustainable and aligned innovation efforts.

Incentives can be broadly categorised into financial and non-financial types, each playing a distinct role in fostering innovation.

Financial Incentives

Financial incentives are direct monetary rewards designed to motivate employees to innovate (Manso, 2017). These include bonuses (Babu, 2018), stock options (Manso, 2011), and long-term compensation plans (Zhu et al., 2023). For example, Google's policy of granting employees 20% of their work time to pursue innovative projects is a notable example of financial incentives that encourage innovation (Babu, 2018). Similarly, General Electric's historic investment in industrial research laboratories illustrates the long-term benefits of committing financial resources to innovation (Babu, 2018).

The following table summarises various financial incentives and their respective advantages and challenges:

Table 1: Financial Incentives

Incentive Type	Description	Advantages	Challenges	Source
Robust reward and recognition system	Employees are granted specific time or resources to pursue innovative projects (e.g., Google's 20% time policy).	Motivates employees to innovate and encourages a culture of creativity and initiative.	May lead to time allocation issues, reducing focus on core responsibilities.	Babu, 2018
Stock options with extended vesting periods	Long-term financial incentives such as stock options, repricing, and golden parachutes.	Attracts and retains top talent while aligning interests with long-term success.	Could create resentment among non-management employees and potential equity and fairness issues.	Manso, 2017

Incentive Type	Description	Advantages	Challenges	Source
Equity incentive schemes	Financial incentives linked to R&D investment and patent generation, typically with longer terms.	Drives R&D investment and innovation output while promoting alignment of managerial goals with innovation.	Potential for inequality in distribution and complexity in managing and evaluating the scheme.	Zhu et al., 2023
Non-executive stock options	Stock options provided to non-executive employees with longer expiration periods, particularly in innovation-intensive roles.	Aligns interests of non-executive employees with company performance and motivates participation in company success.	May lack significant impact compared to executive stock options and potential for perceived inequality among employees.	Chang et al., 2015
Exclusivities and rewards/ premiums	Special recognition or premiums for high-quality contributions.	Fosters a sense of exclusivity and pride among recipients and incentivises high-quality contributions.	May lead to jealousy or resentment among non-recipients.	Frey & Osterloh, 2013

Financial incentives have the advantage of aligning employees' interests with the long-term goals of the organisation (Womack & Jones, 2010). For instance, stock options with extended vesting periods encourage employees to stay with the company and focus on sustained innovation (Manso, 2017). Furthermore, financial incentives that tolerate early failures, such as golden parachutes or option repricing, can foster an environment where employees are willing to take risks, which is crucial for breakthrough innovations (Manso, 2011).

However, financial incentives also come with challenges. They can sometimes encourage short-term thinking, as employees may focus on immediate results rather than sustainable, long-term innovation (Gneezy et al., 2011; Walker, 2010). Additionally, the distribution of financial incentives can sometimes lead to perceived or actual inequities within the organisation, particularly if non-executive employees feel that they are not being fairly compensated compared to their managerial counterparts (Aschenbrücker & Kretschmer, 2022).

Non-Financial Incentives

Non-financial incentives include recognition, opportunities for professional development, and the creation of a supportive work environment. These incentives are crucial for promoting a culture of innovation and can often be more sustainable in the long term.

The following table summarises various non-financial incentives and their respective advantages and challenges:

Table 2: Non-Financial Incentives

Incentive Type	Description	Advantages	Challenges	Source
Gamification elements	Use of badges, points, or other game-like features to incentivise innovation participation (e.g., Bosch's use of badges).	Gamification increases engagement and motivation, making the innovation process more enjoyable.	However, it may result in superficial engagement, distracting from core objectives.	Babu, 2018

Incentive Type	Description	Advantages	Challenges	Source
Positive employee treatment	Includes job security, long-term compensation plans, and a failure-tolerant work environment.	Positive treatment enhances employee loyalty and commitment while encouraging risk-taking and innovation.	It may incur higher costs for the company and could lead to complacency if not balanced with performance expectations.	Manso, 2011
Priority/ Fast-track review incentives	Accelerated review processes for innovative ideas or projects, demonstrating organisational commitment to innovation.	This incentive accelerates the innovation process and demonstrates the company's commitment to innovation.	However, it may result in rushed decisions or overlooked details, potentially bypassing valuable ideas.	Baldwin & von Hippel, 2011; Gans & Ridley, 2013
Career Advancement Opportunities	Opportunities for promotion and professional growth tied to innovation performance.	Encourages employees to contribute innovative ideas as part of their career development.	Potential for bias or perceived unfairness in promotion decisions if not managed carefully.	Carter & Greer, 2013
Innovation Awards	Formal recognition of outstanding innovative achievements within the organisation.	Provides public acknowledgment, which can boost morale and inspire further innovation efforts among employees.	Can lead to unhealthy competition if not managed well, possibly discouraging collaboration.	Khan, 2015; Rosenblatt, 2011

Non-financial incentives can significantly enhance employee engagement and motivation. For example, recognition programs or opportunities for career advancement are highly effective in increasing employee enthusiasm for innovation (Dessler, 2019). Companies that implement gamification elements, such as awarding badges or points for innovative contributions, have

observed heightened participation and enthusiasm among their employees (Babu, 2018). Furthermore, positive employee treatment, including job security and fostering a failure-tolerant environment, has been shown to correlate with increased innovation. Employees are more likely to experiment and pursue innovative ideas when they feel secure in their roles (Manso, 2011).

Additionally, offering career advancement opportunities and innovation awards can be powerful motivators. Linking promotion and professional growth opportunities to innovation performance encourages employees to actively contribute innovative ideas, knowing that their efforts may lead to career progression (Kaplan & Norton, 2008). Innovation awards provide formal recognition of outstanding achievements, boosting morale and inspiring further innovative efforts within the organisation. Although, these incentives must be carefully managed to avoid potential pitfalls, such as perceived unfairness in promotions or unhealthy competition that might discourage collaboration (Gratton, 2007).

Nevertheless, non-financial incentives also present challenges. While they can be effective, they might lead to superficial engagement if not carefully managed (Deterding et al., 2011). For instance, gamification could result in employees focusing more on earning badges than on producing genuinely innovative work. Additionally, the impact of non-financial incentives can be harder to measure compared to financial ones, making it challenging to assess their effectiveness objectively (Pfeffer, 2010).

An effective incentive system often requires a balance between financial and non-financial rewards. Organisations must carefully design their incentive structures to ensure they promote long-term innovation while maintaining fairness and equity among employees.

Recent trends in incentive systems reflect a growing emphasis on non-financial incentives and the integration of these systems into the broader organisational culture. As companies increasingly recognise the importance of a holistic approach to innovation, incentive systems are evolving to include more flexible, personalised rewards that align with the diverse needs of a modern workforce.

Incentives play a critical role in fostering innovation within organisations. Financial incentives, when aligned with long-term goals, can drive sustained innovation, while non-financial incentives contribute to a supportive and engaging work environment. However, the effectiveness of these incentives depends on careful design and implementation, ensuring that they are fair, balanced, and capable of driving the desired innovation outcomes. As the business landscape continues to evolve, so too must the incentive systems that underpin innovation, adapting to new challenges and opportunities in a rapidly changing world.

2.2.2. Internal and External Communication

Communication is a fundamental component of any successful innovation strategy, acting as the conduit that links ideas, individuals, and processes both within the organisation and with external stakeholders. In an increasingly complex and interconnected business environment, the way an organisation communicates can significantly influence its ability to innovate, adapt, and thrive (Zerfaß et al., 2013). Internal communication ensures that knowledge flows seamlessly across the organisation, fostering collaboration, transparency, and a shared vision for innovation (Santos et al., 2015). At the same time, external communication extends this dialogue beyond the organisation's boundaries, engaging key stakeholders, gathering valuable insights, and building partnerships that are crucial for innovation (Hodges, 2018).

This subchapter explores the critical role of communication in driving innovation. It delves into the mechanisms of internal communication, examining how transparency, collaboration tools, and leadership communication contribute to a culture of innovation. It also addresses the challenges posed by digital communication and the importance of ethical practices in maintaining trust and credibility. Additionally, the subchapter highlights the significance of external communication in shaping the organisation’s public image, fostering external collaborations, and ensuring consistency between internal and external messages. By understanding and effectively managing both internal and external communication, organisations can enhance their innovation capabilities and sustain their competitive advantage in a rapidly changing world.

Internal Communication

Internal communication is essential for ensuring that knowledge flows freely within an organisation. Babu (2018) and de Jong et al. (2015) underscore the importance of transparency in promoting collaboration and shared responsibility. When team members have clear visibility into each other's tasks and projects, it not only prevents duplication of efforts but also enhances collective learning and innovation.

Enhancing employees' communication skills is crucial to this process. Communication workshops provide opportunities for employees to refine their skills and gain new perspectives (Reith-Hall & Montgomery, 2023; Selander, 2024). Additionally, the adoption of communication technologies, such as video conferencing, instant messaging, and collaborative platforms, facilitates seamless teamwork across different locations (Wells, 2019). As digital transformation continues to reshape the workplace, these tools are becoming increasingly sophisticated, enabling faster and more inclusive communication. However, organisations must also address the challenges associated with digital communication, such as information overload and the potential for reduced personal interaction, which can hinder the effectiveness of these tools (Arnold et al., 2023; Marsh et al., 2022).

Clearly defined roles and responsibilities are also key to successful internal communication. De Jong et al. (2015) advocate for the clear delineation of tasks to reduce ambiguity and enhance collaboration. Leonardi (2014) highlights how the integration of collaboration tools and social media within organisations can further increase communication visibility. By breaking down barriers, these tools allow employees to tap into the expertise of their colleagues, avoid redundancies, and contribute more effectively to innovation. Communication also plays a crucial role in change management, particularly in innovation-driven environments. When organisations introduce new processes or technologies, clear communication is essential to help

employees understand the changes and their roles in the new landscape (Leonardi, 2014). This helps mitigate resistance and fosters a smoother transition, ensuring that innovation initiatives are successfully implemented.

Additionally, leadership's role in communication cannot be overlooked. Leaders set the tone for how innovation is perceived and pursued within the organisation (Yukl, 2006). Effective leaders communicate a clear vision for innovation, aligning the organisation's efforts with this vision and ensuring that all employees understand their contribution to the broader goals (Kotter, 2012). In times of crisis, such as when innovation projects encounter significant challenges or failures, leadership communication is critical in maintaining morale and refocusing efforts (Heifetz et al., 2009). By addressing setbacks transparently and reinforcing the organisation's commitment to innovation, leaders can help sustain momentum even in difficult times.

Ethical communication is another essential aspect of internal communication. Ensuring that all communication is transparent, honest, and aligned with the organisation's values is crucial for maintaining trust (Eisenbeiss, 2012). This is particularly important in innovation, where the excitement of new ideas can sometimes lead to overpromising or unrealistic expectations (Tourish, 2013). By maintaining ethical standards in communication, organisations can avoid these pitfalls and build a more sustainable innovation culture.

External Communication

External communication extends beyond the organisation, involving engagement with stakeholders such as customers, suppliers, and investors. Sherman (n.d.) notes that external communication is vital for gathering insights and fostering collaborations that drive innovation. Souitaris (2001) categorises the impact of external communication on innovation into two key areas: scanning external information and cooperating with external organisations. Scanning involves gathering valuable insights from key stakeholders, including customers (Hyysalo et al., 2016), suppliers, and competitors. Cooperation, on the other hand, involves working with external entities such as financial institutions and other firms through joint ventures (Croeser, 2022).

As with internal communication, advancements in technology are significantly influencing how organisations manage external communication. Digital tools enable real-time communication with stakeholders across the globe, enhancing the speed and efficiency of information exchange (Du et al., 2010). Although, these tools also bring challenges, such as the need to manage large volumes of data and the risk of miscommunication in less personal digital interactions (Treem & Leonardi, 2013). Organisations must therefore balance the benefits of technological advancements with the need to maintain clear and effective communication channels.

External communication also plays a crucial role in shaping the organisation's public image and nurturing relationships with stakeholders. Ober & Kochmańska (2023) emphasise that consistent and strategic communication helps disseminate mission-related information, gauge public opinion, and maintain stakeholder trust. Moreover, as Croeser (2022) points out, innovation often requires collaboration with external partners, making it imperative that

innovation teams engage with cross-functional teams, external experts, and partners to develop groundbreaking solutions.

Maintaining consistency between internal and external communication is paramount. Wells (2019) argues that aligning these messages fosters trust, transparency, and overall credibility. When an organisation's internal and external communication regarding innovation is consistent, it strengthens the organisation's integrity and enhances its reputation (Fombrun & Riel, 2004).

While metrics for evaluating the effectiveness of communication strategies are covered in more detail in a separate section. It is worth noting here that organisations should regularly assess their communication efforts (Men & Bowen, 2017). Gathering feedback from both internal and external stakeholders can provide valuable insights into the effectiveness of communication strategies, allowing organisations to make continuous improvements and ensure that their communication supports innovation goals effectively (Clampitt, 2016).

In essence, effective communication – both internal and external – is not merely about the exchange of information. It is about creating a transparent environment that nurtures collaboration, clarifies responsibilities, and fosters a culture of innovation. By leveraging both internal and external communication strategies, and by addressing the challenges posed by digital transformation and ethical considerations, organisations can enhance their ability to innovate and maintain a competitive edge in today's dynamic business environment.

2.2.3. Tools and Methods for the Governance of Innovation

In the context of innovation governance, the right tools and methods are essential for ensuring that innovation efforts are aligned with an organisation's strategic goals and long-term vision. These tools not only guide the innovation process but also help in systematically managing resources, mitigating risks, and maximising the impact of innovation initiatives. This subchapter explores key strategic tools and methodologies that are foundational to effective innovation governance, focusing on how they support the alignment of innovation with organisational objectives, enhance decision-making, and facilitate continuous improvement.

Among the most crucial strategic tools discussed are the Business Model Canvas and Value Proposition Design, which provide frameworks for developing, evaluating, and refining business models and value propositions. These tools enable organisations to systematically explore new opportunities (Diderich, 2020), ensuring that their innovation efforts are closely aligned with customer needs (Osterwalder et al., 2015) and adaptable to changing market conditions (Zott et al., 2011). However, while these tools lay the groundwork for strategic alignment, they are part of a broader suite of methodologies that work together to integrate innovation into the overall corporate strategy. Some of the most important tools will be discussed in the following paragraphs.

Among the most widely used strategic tools in innovation management is the Business Model Canvas (BMC) (Osterwalder & Pigneur, 2013). The BMC offers a structured framework that allows organisations to visualise, develop, and analyse their business models (Diderich, 2020). It comprises nine key elements: customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure (Osterwalder et al., 2015; Osterwalder & Pigneur, 2013). This tool enables businesses to understand and assess all essential components of their operations on a single

page, fostering clarity and focus (Maurya, 2016). One of the main advantages of the BMC is its simplicity and flexibility (Alberdi, 2020; Diderich, 2020; Joyce & Paquin, 2016). However, the BMC has its limitations. Its simplicity may sometimes result in a lack of depth, making it less suitable for comprehensive financial or operational analysis (Stapleton, 2024).

Complementing the BMC is the Value Proposition Canvas (Osterwalder et al., 2015). This tool is specifically designed to align a company's products or services with customer needs (Payne et al., 2017). It helps businesses articulate the value they offer by analysing customer pain points, benefits, and the value proposition (Osterwalder et al., 2015; Osterwalder & Pigneur, 2013). This method ensures that products are designed to solve specific customer problems, thus making the offering more attractive and marketable (Bailetti et al., 2020). The advantages of the Value Proposition Canvas are its customer-centric approach (Frow & Payne, 2011; van der Meeren, 2023) and the clear structure it offers for developing and refining products or services (Lindič & Marques da Silva, 2011). By focusing on the value that customers derive, companies can enhance their marketing and product development efforts. However, it is somewhat limited in scope as it does not consider other business model factors beyond the value proposition (Kaplan, 2012).

The Balanced Scorecard (BSC) takes a more holistic approach to performance measurement. It evaluates an organisation's success not only through financial metrics but also through customer satisfaction, internal processes, and learning and growth perspectives (Kaplan & Norton, 1996). By offering this balanced view, the BSC allows companies to track their progress towards long-term strategic goals and ensures that short-term financial gains do not compromise the sustainability of the business (Niven, 2014). The key benefit of the Balanced Scorecard is its comprehensive nature. It provides a multi-dimensional view of performance, helping organisations maintain a balanced focus on both financial and non-financial objectives

(Kaplan & Norton, 2001). The BSC has its limitations. Norreklit et al. (2008) identified the BSC not sufficiently taking the organisation's complexity into account.

Building on this, the Balanced Scorecard offers a structured method for linking innovation activities to key performance indicators (KPIs) across different areas of the business (Kaplan & Norton, 1992). By integrating innovation metrics into the Balanced Scorecard, organisations can ensure that their innovation efforts are consistently measured and managed in line with their broader business objectives (Niven, 2014). This alignment between innovation and performance measurement reinforces the importance of maintaining a balanced approach to innovation, ensuring that it contributes to overall business success (Olve et al., 2001).

In addition to these foundational tools, scenario planning emerges as a critical approach, allowing organisations to anticipate future trends and disruptions (Schoemaker, 1995). By exploring various potential futures, companies can prepare for different scenarios that might impact their business (Cairns & Wright, 2017), thus enabling them to innovate proactively rather than reactively (Sarpong & Maclean, 2011). This forward-looking approach ensures that innovation efforts are aligned not just with current market realities but also with potential shifts and external changes, thereby enhancing the organisation's resilience and adaptability (Schoemaker & Tetlock, 2016).

Furthermore, effective portfolio management plays a vital role in balancing short-term and long-term innovation projects (Cooper, 2011). By using portfolio management tools, organisations can manage the risks and returns associated with various innovation initiatives, making informed decisions about which projects to pursue and which to deprioritise (Nagji & Tuff, 2012). This ensures that resources are allocated efficiently and that the organisation maintains a diverse innovation pipeline, capable of delivering both incremental improvements and radical breakthroughs.

Complementing these internal strategies, corporate venturing serves as an external innovation tool, enabling organisations to explore new markets and technologies through investments in startups (Chesbrough, 2002), partnerships (Keil, 2004), or the creation of internal incubators (von Zedtwitz, 2003; Weiblen & Chesbrough, 2015). This approach not only brings in fresh ideas and expertise from outside the organisation but also fosters an entrepreneurial spirit within, helping companies stay at the forefront of innovation (Rindova & Kotha, 2001).

While this section has focused on high-level governance tools and methodologies, it is important to note that the detailed discussion of specific agile frameworks such as Scrum, Kanban, Lean, and SAFe is covered in the "Execution, Experimentation, Adaptation" subchapter within the "Idea Management" chapter of this work. These frameworks, though operational, also play a strategic role by ensuring that the execution of innovation projects aligns with broader organisational goals. They facilitate the systematic management of resources and processes, ensuring that innovation is not just a creative endeavour but a disciplined and strategic one.

Moreover, the human-centric dimension of innovation governance cannot be overlooked. As Babu (2018) highlights, explaining the significance, potential, and rewards of innovation to individuals within the organisation is crucial for fostering a culture where innovation is both valued and celebrated. This is where tools like design thinking come into play. By integrating design into the organisation through roles like the design catalyst, as proposed by Nusem et al. (2019), companies can ensure early and continuous stakeholder engagement. This human factor is essential for the successful implementation of innovation, underscoring the need for a governance approach that is as much about people as it is about processes and tools.

Finally, the rise of digital tools has revolutionised how organisations manage the innovation process (Edmondson & Harvey, 2017). Technologies such as video conferencing (Vuchkovski et al., 2023), instant messaging (Treem & Leonardi, 2013), and collaborative platforms (Vorecol Editorial Team, 2024) have made it easier to communicate and collaborate across geographical boundaries, enabling more agile and inclusive innovation processes (Rigby et al., 2016). However, these advancements also present challenges, such as information overload and reduced face-to-face interaction, which organisations must address to maintain effective communication and collaboration (Andres, 2002).

Leadership, in this context, plays a critical role in setting the tone for innovation (Edmondson & Harvey, 2017). Leaders must articulate a clear vision for innovation, ensuring that the organisation's efforts are aligned with this vision and that all employees understand their role in achieving it (Rigby et al., 2018). Particularly during times of crisis, transparent and ethical communication from leadership is essential to maintaining morale and keeping innovation efforts on track (Schoemaker & Tetlock, 2016). This ethical dimension reinforces the importance of aligning innovation messages with the organisation's core values, avoiding the pitfalls of overpromising or setting unrealistic expectations (Fombrun & Riel, 2004). The specific roles and responsibilities of leaders in driving innovation will be explored in greater detail in the forthcoming subchapter.

In summary, the strategic tools discussed in this section form the foundation of effective innovation governance. By integrating tools such as business model innovation, scenario planning, the Balanced Scorecard, portfolio management, and corporate venturing, organisations can create a comprehensive and dynamic innovation strategy that aligns with their long-term goals. The detailed application of agile frameworks is further explored in the context of execution and adaptation, where they play a crucial role in operationalising these strategic

initiatives. Within the governance framework, these methodologies ensure that innovation efforts are sustainable, scalable, and aligned with the organisation's broader objectives, driving continuous growth and competitive advantage.

2.2.4. Roles of Innovation

In the complex landscape of innovation, the roles assigned to different actors within an organisation are crucial in shaping both the dynamics and outcomes of the innovation process. From senior executives like the Chief Innovation Officer (CINO) to specialised roles such as the Scrum Master, each contributor plays a vital part in orchestrating and ensuring the success of innovation initiatives. This subchapter first outlines the general roles that drive innovation and then delves into specific responsibilities and traits that are essential across all innovation-related roles.

Leadership in Innovation

Leadership plays a pivotal role in fostering an environment conducive to innovation (Li et al., 2017). Appropriate leadership behaviour is critical for agile teams transitioning into self-organised entities (Gren & Lindman, 2020). Leaders, particularly those exhibiting transformational and servant leadership styles, can inspire teams to take risks, embrace experimentation, and pursue creative problem-solving (Hughes et al., 2018). Constructive leadership, as highlighted by Hughes et al. (2018), is key in building a culture that tolerates early failures and rewards long-term performance, aligning with Manso's (2011) emphasis on fostering a supportive innovation culture.

Chief Innovation Officer (CINO)

The role of the Chief Innovation Officer (CINO) is central to driving strategic innovation within an organisation (Hübner, 2023). Acting as a bridge between various departments – from product development and research to strategy and marketing – the CINO ensures that innovation is integrated across the organisation (Marketing Team, 2024). Stevenson & Euchner

(2013) stress the importance of having specific accountability for driving growth through innovation, positioning the CINO at the helm of strategic innovation initiatives.

The CINO's role is multifaceted, involving several key responsibilities that collectively foster an environment where innovation can thrive (Evans, 2021). These roles include supporting best practices, developing skills, supporting business units in new product and service initiatives, identifying new market spaces, helping people generate ideas, directing seed funding, and designing shelter for promising projects (Di Fiore, 2014).

One of the primary benefits of having a CINO is the strategic alignment they bring to innovation efforts (Marketing Team, 2024). By overseeing the innovation portfolio, the CINO ensures that all innovation initiatives are aligned with the organisation's long-term goals and business strategy. This prevents innovation from happening in silos and ensures that resources are directed toward projects that have the potential to drive significant business impact (Cheng & Love, 2022).

A CINO plays a crucial role in fostering an organisational culture that supports and values innovation (Jain & Schulman, 2018). This involves not only encouraging creativity and risk-taking but also establishing the processes and structures that facilitate continuous learning and experimentation. By promoting a culture of innovation, the CINO helps create an environment where employees feel empowered to contribute ideas and take initiative, leading to more robust and dynamic innovation pipelines (Servatius, 2012b).

Innovation often requires cross-functional collaboration, as ideas need to be nurtured and developed across different areas of expertise (Cheng & Love, 2022). The CINO acts as a bridge between various departments, ensuring that innovation efforts are not confined to a single area of the business (Cheng & Love, 2022; Marketing Team, 2024). By facilitating communication

and collaboration across silos, the CINO helps to unlock the full potential of the organisation's collective knowledge and resources (Newswire, 2018).

Innovation Manager

Innovation Managers (IMs) play a crucial role in operationalising the innovation strategy set by the organisation's leadership, particularly the CINO. While the CINO focuses on the strategic alignment of innovation with business goals, the Innovation Manager is responsible for the day-to-day management and execution of innovation processes within the organisation (Tidd & Bessant, 2009). Their role is multifaceted, involving the management of innovation projects, and the coordination of cross-functional teams (Maier & Brem, 2018).

One of the primary responsibilities of an Innovation Manager is to create the structures and processes necessary for innovation to thrive (Maier & Brem, 2018). This includes designing workflows, establishing innovation pipelines, and ensuring that these processes are flexible enough to adapt to new ideas and changes in the market environment (Vahs & Brem, 2015). By putting these structures in place, the Innovation Manager ensures that innovation is not just an ad-hoc activity but a systematic and repeatable process that can be scaled across the organisation (Vahs & Brem, 2015).

Innovation Managers also play a critical role in fostering an organisational climate that promotes continuous progress and learning. This involves not only encouraging creative thinking and experimentation but also managing the innovation culture to ensure that it supports long-term growth (Müller-Prothmann & Dörr, 2019). For instance, Innovation Managers are often tasked with driving initiatives that promote a culture of openness and collaboration, where employees feel comfortable sharing ideas and taking risks without fear of failure (Servatius & Piller, 2014).

In addition to fostering a conducive innovation environment, Innovation Managers are responsible for preparing and guiding innovation-related decisions (Accept Mission, 2022). This includes gathering and processing information, analysing potential innovation opportunities, and presenting these insights to senior management to secure buy-in for new projects (Gershman & Thurner, 2016). Effective decision-making is at the core of an Innovation Manager's role, as it determines which ideas are pursued, how resources are allocated, and how risks are managed throughout the innovation process (Kelley & Lee, 2010).

Another key aspect of the Innovation Manager's role is navigating the challenges that often accompany innovation, such as resistance to change, resource constraints, and the need for cross-functional collaboration (Servatius, 2012a). Innovation Managers must be adept at overcoming these challenges, often acting as mediators between different departments and stakeholders to ensure that innovation initiatives receive the support they need to succeed.

In summary, the role of the Innovation Manager is critical to the success of an organisation's innovation efforts. They are the executors of the innovation strategy, responsible for translating high-level innovation goals into actionable plans and ensuring that these plans are effectively implemented. By managing the day-to-day innovation activities, fostering a supportive innovation culture, and driving the development of new ideas, Innovation Managers play a key role in sustaining the organisation's competitive edge and ensuring its long-term success.

Scrum Master

In the realm of agile methodologies, the Scrum Master plays a crucial role in maintaining and fostering the principles of Scrum, the widely adopted agile software development methodology. Described as a "servant leader" (Schwaber & Sutherland, 2017), the Scrum Master facilitates the adoption of Agile practices, enabling teams to operate more effectively and adaptively. Unlike traditional management roles, the Scrum Master's focus is on

empowering the team to take collective ownership of their work, fostering an environment of shared leadership (Spiegler et al., 2021). This role is particularly challenging in hierarchical organisations, where balancing agile practices with established structures can be difficult (Bäcklander, 2019).

Chief Digital Officer (CDO)

The Chief Digital Officer (CDO) is a catalyst for innovation, particularly in overseeing the digital transformation of the organisation. The CDO's role is multifaceted, involving problem-solving, adaptability, and the continuous renewal of the organisation's innovative capabilities (Pisano, 2019; Scuotto et al., 2024). As digital technologies become increasingly integral to business operations, the CDO ensures that the organisation not only adopts new technologies but also integrates them in ways that are sustainable and aligned with long-term strategic goals (Berbel-Vera et al., 2022).

Well-Connected Managers and Cross-Functional Teams

Well-connected managers are pivotal in fostering collaboration, information exchange, and effective decision-making within the organisation (Hatala & Lutta, 2009). As advocated by de Jong et al. (2015), these managers create environments where ideas can flow seamlessly, driving innovation. Complementing their efforts, cross-functional teams bring together diverse expertise, ensuring that innovation initiatives are informed by a broad range of perspectives and skills (Majchrzak et al., 2012; Mohamed et al., 2004). This collaboration is essential for overcoming the silos that often impede innovation.

Entrepreneurial Roles

Entrepreneurs within an organisation, as outlined by Mintzberg (1973), play a key role in driving innovation by identifying opportunities, managing resources, and fostering a culture of creativity and risk-taking. Their ability to navigate uncertainty and embrace change is integral to the innovation process, as they are often at the forefront of initiating and sustaining innovative efforts within the company (Cornwall et al., 2019).

Building an Innovation Culture

At the heart of successful innovation is a culture that supports experimentation and continuous learning. Thomke (2020) emphasises the importance of creating systems that encourage experimentation, enabling organisations to adapt and evolve in response to new challenges. Leadership plays a crucial role in this transformation by creating an innovation strategy, designing an innovation system, and fostering an innovation culture (Pisano, 2019). These tasks are essential for building the organisation's capacity for sustained innovation, ensuring that it can continue to innovate in a rapidly changing business environment.

In conclusion, the success of an organisation’s innovation efforts relies heavily on the effective interplay of diverse roles, each contributing uniquely to the innovation process. Leadership positions, such as the Chief Innovation Officer (CINO) and Chief Digital Officer (CDO), are essential in setting the strategic direction and ensuring that innovation initiatives align with the organisation’s long-term goals. The CINO plays a pivotal role in fostering a culture of creativity, managing risks, and driving innovation across departments, which is crucial for maintaining the organisation's competitive edge in a rapidly evolving business landscape.

Equally important is the role of the Innovation Manager (IM), who translates the strategic vision into actionable plans. The IM oversees the execution of innovation initiatives, ensuring that ideas are systematically developed, refined, and brought to market. By coordinating cross-functional teams and managing day-to-day processes, the IM helps navigate the practical challenges of innovation, turning creative potential into tangible business outcomes.

Supporting these leadership roles are others like the Scrum Master, who guides teams through the complexities of the innovation process by fostering collaboration and experimentation. Additionally, well-connected managers and cross-functional teams ensure smooth communication and cooperation across departments, which is essential for integrating innovation efforts throughout the organisation.

Together, these roles form a robust innovation governance structure that encourages creativity while ensuring alignment with broader business objectives. By clearly defining and supporting each role, organisations can build an adaptable framework that promotes continuous learning, experimentation, and growth. As the business environment continues to evolve, the adaptability of these roles will be key to sustaining innovation and driving long-term success.

2.3. Metrics

The ability to innovate is a key determinant of an organisation's long-term success and sustainability. However, measuring the effectiveness and impact of innovation can be challenging due to its complex and multifaceted nature. Innovation metrics provide a structured approach to evaluating and managing innovation processes, offering insights into how well an organisation is fostering creativity, implementing new ideas, and achieving strategic objectives. This chapter delves into the various types of innovation metrics, exploring their significance, the challenges associated with their implementation, and how they can be used to drive continuous improvement and alignment with organisational goals.

Table 3 provides an extensive categorisation of innovation metrics, organised by their measurability and whether they are objective or subjective. This categorisation helps in understanding how different types of metrics can be utilised to assess various aspects of innovation within an organisation, offering both tangible and intangible insights into innovation performance.

Measurable Metrics

Measurable metrics are those that can be quantified, providing clear, numerical data that organisations can track and compare over time. These metrics are crucial for setting benchmarks, monitoring progress, and making data-driven decisions. They are often based on factual, hard data, making them reliable for comparison and analysis. Examples include the number of new products launched, the amount of R&D investment, or the percentage increase in market share due to new innovations. These metrics are typically straightforward to measure and provide clear, quantifiable insights into the innovation process.

In addition, there are subjective metrics that, while based on personal opinions or perceptions, are collected in a structured format such as surveys or ratings. Examples include employee satisfaction with the innovation process or customer perceptions of innovation in a company's products. Though subjective, these metrics can be quantified and tracked over time, allowing organisations to monitor changes in sentiment.

Objective Metrics

Objective metrics provide factual, unbiased data that is not influenced by personal feelings or interpretations. These metrics are essential for evaluating innovation outcomes with a high degree of reliability. While some of these metrics, like the number of patents filed, ROI from innovation projects, or time-to-market for new products, are quantifiable, others may be qualitative in nature but still based on observable facts. For instance, the existence of an innovation strategy or the presence of an R&D department within the organisation reflects an objective reality, even though it may not be easily quantifiable. Such structural insights offer a clear understanding of the organisation's commitment to innovation.

Subjective Metrics

Subjective metrics capture personal perspectives, opinions, or feelings about the innovation process, providing a crucial understanding of the cultural and emotional factors that influence innovation within an organisation. These metrics can be either quantifiable or qualitative. For example, surveys measuring employee engagement in innovation activities or customer satisfaction with new products fall into the quantifiable category, as they can be expressed in numerical terms like percentages or average scores.

On the other hand, subjective metrics that are qualitative in nature include anecdotal feedback from employees about the innovation culture, leadership perceptions of innovation

success, or narratives about the innovation journey within the organisation. While these metrics are not easily measured, they offer valuable insights that can inform strategic decisions.

Balancing Measurable and Subjective Metrics

The table categorises these metrics to illustrate the importance of using a balanced approach when assessing innovation. Measurable and objective metrics provide clear, actionable data, while subjective metrics offer deeper insights into the human and cultural aspects of innovation. By combining these different types of metrics, organisations can achieve a more comprehensive understanding of their innovation performance, ensuring that they not only meet quantitative goals but also foster a positive innovation culture that supports long-term success.

Table 3: Innovation Metrics

Number	Metric	Measurable	Objective/Subjective
1	Number of patents	Measurable	Objective
2	Total number of employees in the R&D department	Measurable	Objective
3	A number of projects in active development	Measurable	Objective
4	The percentage of R&D expenses in relation to sales	Measurable	Objective
5	The percentage of the portfolio of key and new projects	Measurable	Objective
6	The net present value of the entire new product and service portfolio	Measurable	Objective
7	Cost reduction relative to R&D investment	Measurable	Objective
8	Budget deviation	Measurable	Objective
9	Deviation from the schedule	Measurable	Objective
10	Percentage of sales of the current year concerning new products and services	Measurable	Objective
11	A number of products sold in the last n-th number of years	Measurable	Objective
12	Resources invested in R&D (financial or human)	Measurable	Objective
13	Number of ideas generated	Measurable	Objective
14	Idea potential (e.g. likert scale)	Measurable	Subjective
15	Idea potential (e.g., interviews)	Not Measurable	Subjective
16	Number of projects in a pipeline	Measurable	Objective
17	% of R&D budget for radical [innovation]	Measurable	Objective
18	Number of people	Measurable	Objective

Number	Metric	Measurable	Objective/Subjective
19	Measure of importance of patents (e.g. likert scale)	Measurable	Subjective
20	Measure of importance of patents	Not Measurable	Subjective
21	Number of new patents generated	Measurable	Objective
22	Number of projects at each stage	Measurable	Objective
23	Number of innovative projects	Measurable	Subjective
24	Total cost of new product effort	Measurable	Objective
25	Net margin of ROI	Measurable	Objective
26	Project cost vs budget	Measurable	Objective
27	Market share trends	Measurable	Objective
28	New product sales	Measurable	Objective
29	Profit from new product sales	Measurable	Objective
30	Financial return to business	Measurable	Objective
31	Strategic alignment with the business	Not Measurable	Subjective
32	Projected value of R&D pipeline	Measurable	Objective
33	Gross profit margin	Measurable	Objective
34	Product quality and reliability	Measurable[1]	Objective
35	Sales or gross profits from new products	Measurable	Objective
36	Accomplishment of project milestones (quantitative)	Measurable	Objective
37	Accomplishment of project milestones (strategic or qualitative) objectives (e.g., how well the project aligns with overarching business goals, the creativity of solutions, or the effectiveness of team collaboration)	(Not) Measurable	Subjective
38	Achievement of R&D pipeline objectives (clear, quantitative goals)	Measurable	Objective

[1] if there are clear quality standards to assess product quality

Number	Metric	Measurable	Objective/Subjective
39	Achievement of R&D pipeline objectives_qualitative goals or strategic alignment	(Not) Measurable	Subjective
40	Quality of R&D personnel	Not Measurable	Subjective
41	Level of business approval of projects	Not Measurable	Subjective
42	Comparative manufacturing costs	Measurable	Objective
43	Time-to-market	Measurable	Objective
44	Percentage of senior management time spent on innovation vs. day-to-day business	Measurable	Objective
45	Percentage of senior leaders with innovation training	Measurable	Objective
46	The existence of formal innovation processes	Measurable	Objective
47	The percentage of employees who have received innovation training	Measurable	Objective
48	The number of new opportunities gained through innovation	Measurable	Objective
49	The number of innovations that have made a considerable impact on the business	Measurable	Objective
50	Targeted vs. actual break-even time	Measurable	Objective
51	Investment in external startups or innovation ecosystems	Measurable	Objective
52	Percentage of R&D budget allocated to collaborations or partnerships	Measurable	Objective
53	Number of joint ventures or strategic alliances formed	Measurable	Objective
54	Number of successful innovations sourced externally	Measurable	Objective
55	Percentage of budget allocated to long-term, high-risk innovation projects	Measurable	Objective

Number	Metric	Measurable	Objective/Subjective
56	Number of failed innovation projects and the lessons learned	Measurable	Objective
57	organisation's tolerance for experimentation (e.g. survey)	Measurable	Subjective
58	Time and resources allocated to exploring unconventional or risky ideas	Measurable	Objective
59	(Dedicated) budget for experimental or pilot projects	Measurable	Objective
60	Leadership effectiveness in driving innovation (e.g. survey)	Measurable	Subjective
61	Recognition or awards received by leaders for innovation-related initiatives	Measurable	Objective
62	Alignment of leadership vision with the overall innovation strategy	Measurable	Subjective
63	Participation rates in innovation workshops	Measurable	Objective
64	Number of implemented ideas generated by employees	Measurable	Objective
65	Collaboration and knowledge-sharing within the organisation (e.g., survey)	Measurable	Subjective

Source: Brattström et al., 2018; Markham & Lee, 2013; Milbergs & Vonortas, 2004; Schwartz et al., 2011; Sobon et al., 2020; Solverboard, 2021; Startup Insider Redaktion, 2023

Table 4 provides a thorough evaluation of the advantages and disadvantages associated with various innovation metrics. This section aims to outline the specific strengths and potential limitations of each metric type as detailed in the table, helping organisations to make informed decisions about which metrics to employ.

Objective metrics, exemplified by quantifiable figures, provide a standardised assessment across different organisations, offering a tangible basis for comparison. This inclusion of both subjective and objective measures recognises the multifaceted nature of innovation, acknowledging the importance of both quantitative and qualitative dimensions.

Objective metrics, such as “The number of patents” or “The financial return to business”, offer clear and comparable data points. They serve as concrete indicators of innovation success and facilitate benchmarking against industry standards. However, these metrics have limitations in capturing nuanced, qualitative aspects of innovation success, such as the creativity or strategic alignment of projects. Relying solely on objective metrics might lead to overlooking the intangible elements crucial for sustained innovation.

Subjective metrics, like “Leadership effectiveness” or “Collaboration and knowledge-sharing”, provide insights into the human and cultural aspects of innovation. They capture perceptions, attitudes, and cultural nuances within the organisation. However, the challenge lies in the variability of interpretation. Different stakeholders may have divergent opinions, making it challenging to establish a unanimous consensus. Subjective metrics also inherently carry a degree of bias, as individual perspectives may not align with organisational objectives.

Quantitative measures, such as financial metrics or project milestones, offer clear, numerical benchmarks for assessing progress and success. They provide a straightforward way to track performance and make data-driven decisions. Nevertheless, these measures might fall short in encapsulating the intricate and long-term impacts of innovation. For instance, a high number of

patents does not necessarily guarantee the strategic relevance or market success of those innovations. A more holistic approach that combines quantitative and qualitative assessments is crucial for a comprehensive understanding of innovation outcomes.

The results of the analysis are summarised in the following table.

Table 4: Pros and Cons of the Innovation Metrics

Number	Metric	Object	Pros	Cons
1	Number of patents	If company is inventive or not	Diffuse as a metric, recognised in the community, ...	Do not cover the entire innovation cycle, say nothing about if the innovation is successful or not, pointless if not combined with the value of the patent
2	Total number of employees in the R&D department	R&D department's capacity and expertise	Indicates potential knowledge base and capabilities, objective, supports scalability of R&D projects: allowing for the simultaneous exploration of multiple projects	May not reflect the efficiency or productivity of the R&D team
3	A number of projects in active development	Current project workload	Offers a quantifiable measure of the organisation’s commitment to ongoing R&D activities.	Quantity alone does not ensure project quality, and resource allocation may be challenging with a high project workload.
4	The percentage of R&D expenses in relation to sales	Efficiency in resource allocation	Objective financial measure, Financial Impact Indicator: A higher percentage signifies a substantial investment in R&D, indicating the strategic importance of innovation	A high percentage may not guarantee successful innovation outcomes, and a balance with other business priorities is essential.
5	The percentage of the portfolio of key and new projects	Portfolio composition reflecting key and new projects	Risk mitigation: diversify project portfolio, innovation focus, resource allocation efficiency	May not capture the specific impact or success factor of individual projects
6	The net present value of the entire new product and service portfolio	Financial value of innovation	Comprehensive financial assessment, widely used and accepted in the community	Requires accurate financial projections, and success may be influenced by external factors beyond financial metrics.
7	Cost reduction relative to R&D investment	Efficiency in cost management	Efficiency measure	Strict cost reduction may lead to compromises in R&D quality or long-term innovation capabilities.

Number	Metric	Object	Pros	Cons
8	Budget deviation	Adherence to R&D budget	Gives insight to financial discipline & adherence to planed R&D budgets	Rigidity in adhering to budgets may limit flexibility in responding to unforeseen opportunities or challenges.
9	Deviation from the schedule	Timeliness in project execution	Timeliness measure	Strict adherence may not allow flexibility for adapting to changes or seizing unexpected opportunities.
10	Percentage of sales of the current year concerning new products and services	Market adoption	market adoption indicator (quantifies success in introducing new products to the market), gives insight into market adoption patterns (dynamics of launching & promoting innovative products)	May not capture long-term success or sustainability of new products and services.
11	A number of products sold in the last n-th number of years	Market performance	Quantifies the organisation's success in selling products over a specified period, forms the basis for research on long-term market performance and the sustainability of innovative product sales.	Does not consider the innovation potential of current projects or products in development
12	Resources invested in R&D (financial or human)	Overall R&D investment	Quantifies the overall investment in R&D activities	The amount invested may not directly correlate with the quality or success of innovation outcomes.
13	Number of ideas generated	Creativity (& ideation capability)	Reflects the organisation's capacity for generating creative ideas., provides a foundation for research on the correlation between ideation capability and overall innovation success.	Quantity alone does not ensure the quality or feasibility of the ideas.
14	Idea potential (e.g. likert scale)	Quality and viability of generated idea	Assesses the quality and viability of generated ideas, insights on how idea quality impacts innovation potential and success	Subjective evaluation may vary, and not all potentially successful ideas may be recognized.
15	Idea potential (e.g., interviews)	Subjective assessment of idea potential	Incorporates diverse opinions on idea quality and viability	Subjective responses may vary, and opinions may not align with actual innovation success

Number	Metric	Object	Pros	Cons
16	Number of projects in a pipeline	Project development and innovation pipeline	Basis on how a well-managed pipeline contributes to overall innovation success.	A large pipeline may require careful management to ensure effective resource allocation and prevent project overload.
17	% of R&D budget for radical [innovation]	Allocation of resources for transformative projects	Indicates the organisation's commitment to transformative projects	Immediate Returns Uncertainty: A radical approach may have a longer gestation period, and immediate returns may be uncertain.
18	Number of people	R&D team size and expertise	Quantifies the expertise within the R&D team	Coordination Challenges: Large teams may face communication and coordination challenges.
19	Measure of importance of patents (e.g. likert scale)	Evaluation of the significance of patents	Provides a qualitative measure of the strategic importance of patents	Subjectivity: Evaluation is subjective, and different stakeholders may have varied perceptions of importance.
20	Measure of importance of patents	Subjective evaluation of the significance of patents	Qualitative measure of the strategic importance of patents	Evaluation is subjective, and different stakeholders may have various perceptions
21	Number of new patents generated	Quantity and frequency of patent generation	Quantifies the organisation's output in terms of new intellectual property	Quality vs. Quantity: Quantity alone may not reflect the quality or strategic value of patents.
22	Number of projects at each stage	Distribution of projects across development stages	Insight on how a balanced distribution of projects across stages contributes to overall innovation success	Potential Bottlenecks: Uneven distribution may lead to resource bottlenecks or underutilization.
23	Number of innovative projects	Identification of projects with innovative aspects	Highlights commitment to projects with innovative elements	Definition Challenges: Defining "innovative" may be subjective and may vary across stakeholders.

Number	Metric	Object	Pros	Cons
24	Total cost of new product effort	Financial investment in new product development	Quantifies the overall financial investment in new product development	Short-Term Focus: Emphasising total cost may encourage cost-cutting measures that compromise long-term innovation success. Overemphasis on cost may lead to a neglect of product quality and innovation, affecting the product's market acceptance.
25	Net margin of ROI	Profitability of the return on investment	Measures profitability of the return on investment, objective, decision-making support	Market Fluctuations: Vulnerable to market fluctuations and external economic factors.
26	Project cost vs budget	Cost efficiency in project management	Measures ability to manage projects efficiently within budget constraints,	Rigidity in adhering to budgets may limit adaptability to changing project needs.
27	Market share trends	Changes in market share over time	Monitors the competitive positioning in the market through changes in market share	Market share may be influenced by external factors beyond the organisation's control.
28	New product sales	Quantity of sales generated by new products	Quantifies the market acceptance and success of new products	May not capture the long-term sustainability of new products.
29	Profit from new product sales	Financial profit generated by new products	Quantifies the financial profit generated by new products	The profitability metric may take time to recover the initial investment.
30	Financial return to business	Overall financial impact on the business	Quantifies the overall financial impact of R&D activities on the business	May not capture the long-term and indirect financial impacts on the business.
31	Strategic alignment with the business	Alignment of R&D activities with overall business strategy	Measures the degree to which R&D activities align with the broader business strategy	Strategic alignment may be challenging due to shifts in business strategy or unclear organisational goals.

Number	Metric	Object	Pros	Cons
32	Projected value of R&D pipeline	Estimated future value of R&D projects in the pipeline	Quantifies the estimated future value of R&D projects, offering insights into their potential impact	Predicting the future value may be subject to uncertainties in market dynamics and technological advancements.
33	Gross profit margin	Profitability of the overall product portfolio	measures profitability of overall product portfolio	Vulnerable to market fluctuations and external economic factors
34	Product quality and reliability	Evaluation of the quality and reliability of products	Reflects commitment to delivering high-quality and reliable products, enhancing customer trust	Quality metrics may not fully capture customer satisfaction or subjective perceptions.
35	Sales or gross profits from new products	Financial performance of new products	Quantifies financial performance, objective	May not capture the long-term sustainability of financial performance.
36	Accomplishment of project milestones (quantitative)	Achievement of specific project goals and objectives	Assesses ability to adhere to project timelines: ensuring projects stay on track, serves as a benchmark for evaluating the efficiency and effectiveness of project execution, helps in proactive risk management and ensures timely intervention if deviations occur	Focusing solely on milestones may overlook the holistic success of a project, as certain crucial aspects might not be captured by predefined milestones Milestones may not adequately measure qualitative aspects like creativity, customer satisfaction, or the adaptability of the project to unforeseen changes.
37	Accomplishment of project milestones_strategic or qualitative objectives (e.g., how well the project aligns with overarching business goals, the creativity of solutions, or the effectiveness of team collaboration)	Assessment of project success	Captures strategic and qualitative aspects of project achievement	Strict adherence to predefined milestones may overlook holistic project success
38	Achievement of R&D pipeline objectives (clear, quantitative goals)	Fulfilment of overall R&D pipeline goals	Provides valuable data for strategic decision-making: allowing leadership to assess whether the R&D pipeline is on track to meet organisational objectives	Unintended consequences or misalignment may arise if objectives are not well-defined.

Number	Metric	Object	Pros	Cons
39	Achievement of R&D pipeline objectives (qualitative goals or strategic alignment)	Evaluates whether R&D initiatives align with broader strategic goals or qualitative targets	Ensures that R&D efforts are aligned with the long-term vision and strategy of the organisation, fostering innovation that supports business objectives	Qualitative goals may be subjective and harder to measure, leading to potential misalignment between perception and actual contribution to strategic success
40	Quality of R&D personnel	Evaluation of the expertise and capability of R&D personnel	Reflects capability of the team to drive innovation	High-quality personnel may face resource challenges in larger organisations.
41	Level of business approval of projects	Business stakeholders' endorsement of R&D projects	Indicates the level of endorsement and support from business stakeholders for R&D projects	Decision-Making Challenges: Stakeholder opinions may vary, and obtaining unanimous approval can be challenging.
42	Comparative manufacturing costs	Cost efficiency in manufacturing processes	Encourages culture of continuous improvement in manufacturing processes to maintain cost competitiveness, identifies areas of potential cost overrun, allowing proactive risk management and mitigation strategies	Quality Sacrifice: Overemphasis on cost reduction may lead to compromises in product quality.
43	Time-to-market	The time it takes to introduce a new product or service to the market.	Provides insights to the organisation's speed of innovation	May not consider the complexity or long-term impact of innovation
44	Percentage of senior management time spent on innovation vs. day-to-day business	Measure of senior management time allocation	Indicates leadership commitment to innovation	May not reflect the effectiveness on time spent or the impact on innovation outcomes
45	Percentage of senior leaders with innovation training	Measure of senior leaders with innovation training	Demonstrates organisational investment in developing innovation (management) skills	Training alone may/ does not guarantee effective leadership in driving innovation
46	The existence of formal innovation processes	Measure of the presence of formalised innovation processes	Provides structure and guidance for innovation activities	Formality may lead to rigidity; effectiveness is dependent on process quality

Number	Metric	Object	Pros	Cons
47	The percentage of employees who have received innovation training	Measure of employees with innovation training	Indicates broad organisational focus on innovation skills development	Training alone may not guarantee a culture of innovation or successful outcomes
48	The number of new opportunities gained through innovation	Quantity of new opportunities resulting from innovation	Demonstrates effectiveness of innovation activities in generating opportunities	Quantity alone may not reflect the strategic or quality relevance of opportunities
49	The number of innovations that have made a considerable impact on the business	Quantity of innovations with significant business impact	Highlights successful innovations contributing to business success	May not consider the specific nature or sustainability of impact
50	Targeted vs. actual break-even time	Time required for an innovation project to break even	Provides insights into the efficiency of resource allocation and financial planning	May not consider qualitative aspects of innovation success
51	Investment in external startups or innovation ecosystems	Financial resources allocated to external ventures	Indicates organisation's commitment to external collaborations	Success depends on the success of external startups, which may be unpredictable
52	Percentage of R&D budget allocated to collaborations or partnerships	Measure of R&D budget allocation to collaborations	Reflects a commitment to external collaborations and knowledge exchange	Success depends on the quality and relevance of collaborations
53	Number of joint ventures or strategic alliances formed	Quantity of partnerships formed	Organisation’s collaborative efforts in the industry	Quality of partnerships may vary, and not all joint ventures may lead to successful innovation
54	Number of successful innovations sourced externally	Quantity of successful innovations acquired externally	Diversifies innovation sources and brings external expertise	May face resistance internally or encounter difficulties in aligning with existing processes and culture.
55	Percentage of budget allocated to long-term, high-risk innovation projects	Allocation of financial resources to high-risk projects	Demonstrates organisation's risk tolerance and commitment to long-term innovation	High risk may lead to failures
56	Number of failed innovation projects and the lessons learned	Quantity of unsuccessful innovation projects	Offers opportunities for learning and improvement	High failure rates may be perceived negatively, effectiveness of lessons learned is crucial

Number	Metric	Object	Pros	Cons
57	Organization's tolerance for experimentation (e.g. survey)	Assessment of the organisation's openness to experimentation	Provides insights into the organisational culture regarding risk and experimentation	Subjective -> responses may vary, cultural change takes time
58	Time and resources allocated to exploring unconventional or risky ideas	Quantity of resources allocated/dedicated to exploring unconventional ideas	Demonstrates commitment to fostering creativity and exploring diverse ideas	May divert resources from more certain projects, success is uncertain
59	(Dedicated) budget for experimental or pilot projects	Financial resources allocated for experimental projects	Encourages structured approach to experimentation	Limited budget may constrain the scale of experiments and success is uncertain
60	Leadership effectiveness in driving innovation (e.g. survey)	Evaluation of leadership's effectiveness in fostering innovation	Insights into the perceived impact of leadership	Subjective, leadership effectiveness is multifaceted
61	Recognition or awards received by leaders for innovation-related initiatives	Quantity of awards or recognition received by leaders	Indicated acknowledgement of leadership's contributions to innovation	Relevance of awards varies, they also may not capture the full spectrum of leadership impact
62	Alignment of leadership vision with the overall innovation strategy	Assessment of alignment between leadership vision and innovation strategy	Reflects leadership commitment to innovation goals	Subjective perceptions may vary, alignment is subject to changes in leadership vision
63	Participation rates in innovation workshops	Participation of employees participating in innovation workshops	Employee engagement and interest in innovation activities	May not reflect the quality of contributions or subsequent innovation outcomes
64	Number of implemented ideas generated by employees	Quantity of ideas generated by employees that were also implemented	Effectiveness of idea implementation processes	Quantity alone does not ensure the success or impact of implemented ideas
65	Collaboration and knowledge-sharing within the organisation (e.g., survey)	Assessment of collaboration and knowledge-sharing culture	Insights into the openness to sharing information	Subjective responses may vary, cultural change takes time

Source: Brattström et al., 2018; Markham & Lee, 2013; Milbergs & Vonortas, 2004; Schwartz et al., 2011; Sobon et al., 2020; Solverboard, 2021; Startup Insider Redaktion, 2023

Several metrics showcase interconnectedness, which is one of their significant strengths. For instance, the “Percentage of R&D budget allocated to collaborations or partnerships” is linked to “Investment in external startups or innovation ecosystems” and “Number of joint ventures or strategic alliances formed.” This interconnectedness not only highlights the strategic alignment required across different innovation activities but also underscores the synergistic effects that can be achieved when multiple innovation efforts are coordinated effectively. The interconnectedness of these metrics ensures that success in one area, such as forming strategic alliances, can positively influence other areas, like investment in innovation ecosystems, leading to a more cohesive and integrated innovation strategy.

Metrics such as the “Percentage of budget allocated to long-term, high-risk innovation projects” and “Number of failed innovation projects and the lessons learned” further illustrate the benefits of interconnectedness by revealing the relationship between risk and innovation. Allocating resources to high-risk projects demonstrates an organisation's commitment to pursuing breakthrough innovations. Simultaneously, tracking failed projects and the lessons learned from them not only encourages a culture of experimentation but also fosters resilience and continuous improvement. This interconnected approach ensures that the lessons derived from one initiative can inform and enhance future projects, reducing the likelihood of repeated mistakes and strengthening the organisation's overall innovation capabilities.

Several metrics highlight the significance of the human element in innovation, with interconnectedness playing a crucial role in linking leadership, employee engagement, and idea implementation. For example, “Leadership effectiveness in driving innovation,” “Participation rates in innovation workshops,” and “Number of implemented ideas generated by employees” work together to create a comprehensive view of how leadership and employee involvement drive innovation success. The interconnectedness of these metrics demonstrates that strong leadership can enhance employee participation in innovation activities, which in turn can lead

to a higher number of implementable ideas. This holistic view acknowledges that innovation is not just a procedural or technical endeavour but is deeply influenced by the people within the organisation, who are motivated and guided by effective leadership.

Financial metrics, such as "Net present value of the entire new product and service portfolio" and "Gross profit margin," illustrate the interconnectedness between innovation efforts and financial performance. These metrics highlight the importance of ensuring that innovation projects are not only creatively and technically sound but also financially viable. The interconnectedness between these metrics ensures that innovative ideas are consistently evaluated through a financial lens, promoting sustainable growth and ensuring that the organisation's innovation strategy contributes positively to its financial health.

Metrics like "Time-to-market" and "Targeted vs. actual break-even time" introduce a temporal dimension to the analysis, emphasising the interconnected nature of time and financial viability. These metrics acknowledge that the speed of innovation and the time required for projects to achieve financial success are critical factors in determining overall innovation effectiveness. The interconnectedness here helps organisations understand that accelerating time-to-market can lead to quicker financial returns, but it must be balanced against the quality and long-term impact of the innovation.

Overall, the interconnectedness of these metrics offers several advantages. It enables a more integrated approach to innovation management, where different aspects of the innovation process are not viewed in isolation but as part of a cohesive system. This holistic perspective facilitates better decision-making, as it allows organisations to see how improvements or setbacks in one area can influence outcomes in another, ultimately leading to more robust and effective innovation strategies. The connection between these metrics and other chapters is summarised in the following table.

Table 5: Interconnectedness of the Innovation Metrics

Number	Metric	Connection to another category within this thesis or another metric
1	Number of patents	
2	Total number of employees in the R&D department	Can be correlated with the number of projects and resources invested in R&D to gauge overall R&D effectiveness
3	A number of projects in active development	Link to percentage of portfolio dedicated to key projects to assess strategic focus
4	The percentage of R&D expenses in relation to sales	Connect with net present value of the portfolio to assess the return of the investment
5	The percentage of the portfolio of key and new projects	
6	The net present value of the entire new product and service portfolio	Correlates with the percentage of sales concerning new products and services to assess the financial success of innovation.
7	Cost reduction relative to R&D investment	Connect with budget deviation to assess the overall efficiency of R&D cost management
8	Budget deviation	Link with the percentage of R&D expenses to understand how well the allocated budget aligns with overall sales.
9	Deviation from the schedule	Relation to the number of projects in a pipeline to assess the overall project management efficiency
10	Percentage of sales of the current year concerning new products and services	Can be connected with the number of products sold in the last n-th number of years to assess the overall market impact.
11	A number of products sold in the last n-th number of years	Correlates with the percentage of the portfolio dedicated to key projects to assess the strategic focus on successful products.
12	Resources invested in R&D (financial or human)	Connects with the number of ideas generated and the idea potential to assess the overall innovation capacity.
13	Number of ideas generated	Can be linked with the idea potential to assess the organisation's capability to turn ideas into successful projects.
14	Idea potential (e.g. likert scale)	Connects with the number of projects in a pipeline to understand the conversion of ideas into actionable projects.
15	Idea potential (e.g., interviews)	

Number	Metric	Connection to another category or metric
16	Number of projects in a pipeline	Links with the percentage of the portfolio dedicated to key projects to assess the strategic focus on successful projects
17	% of R&D budget for radical [innovation]	Incentives, tools and methods for the governance of innovation
18	Number of people	Roles of innovation, internal communication, and idea mapping, evaluation, rejection, project review
19	Measure of importance of patents (e.g. likert scale)	
20	Measure of importance of patents	
21	Number of new patents generated	
22	Number of projects at each stage	
23	Number of innovative projects	
24	Total cost of new product effort	
25	Net margin of ROI	
26	Project cost vs budget	
27	Market share trends	
28	New product sales	
29	Profit from new product sales	
30	Financial return to business	
31	Strategic alignment with the business	

Number	Metric	Connection to another category or metric
32	Projected value of R&D pipeline	
33	Gross profit margin	
34	Product quality and reliability	
35	Sales or gross profits from new products	
36	Accomplishment of project milestones (quantitative)	
37	Accomplishment of project milestones (strategic or qualitative objectives (e.g., how well the project aligns with overarching business goals, the creativity of solutions, or the effectiveness of team collaboration))	Time-to-market, financial return to business
38	Achievement of R&D pipeline objectives (clear, quantitative goals)	
39	Achievement of R&D pipeline objectives (qualitative goals or strategic alignment)	
40	Quality of R&D personnel	
41	Level of business approval of projects	Connects with the net present value of the portfolio to assess the alignment of R&D activities with overall business strategy.
42	Comparative manufacturing costs	Connects with the cost reduction relative to R&D investment to assess the overall efficiency of manufacturing processes.
43	Time-to-market	
44	Percentage of senior management time spent on innovation vs. day-to-day business	
45	Percentage of senior leaders with innovation training	
46	The existence of formal innovation processes	
47	The percentage of employees who have received innovation training	

Number	Metric	Connection to another category or metric
48	The number of new opportunities gained through innovation	
49	The number of innovations that have made a considerable impact on the business	
50	Targeted vs. actual break-even time	Time-to-market, financial return to business
51	Investment in external startups or innovation ecosystems	Percentage of R&D budget allocated to collaborations or partnerships
52	Percentage of R&D budget allocated to collaborations or partnerships	Investment in external startups or innovation ecosystems
53	Number of joint ventures or strategic alliances formed	
54	Number of successful innovations sourced externally	
55	Percentage of budget allocated to long-term, high-risk innovation projects	% of R%D budget for radical [innovation]
56	Number of failed innovation projects and the lessons learned	
57	Organization's tolerance for experimentation (e.g. survey)	
58	Time and resources allocated to exploring unconventional or risky ideas	
59	(Dedicated) budget for experimental or pilot projects	
60	Leadership effectiveness in driving innovation (e.g. survey)	
61	Recognition or awards received by leaders for innovation-related initiatives	
62	Alignment of leadership vision with the overall innovation strategy	
63	Participation rates in innovation workshops	
64	Number of implemented ideas generated by employees	
65	Collaboration and knowledge-sharing within the organisation (e.g., survey)	

Source: Brattström et al., 2018; Markham & Lee, 2013; Milbergs & Vonortas, 2004; Schwartz et al., 2011; Sobon et al., 2020; Solverboard, 2021; Startup Insider Redaktion, 2023

While the innovation metrics table presents a comprehensive framework, a discerning evaluation also reveals open points and potential gaps that merit consideration for a more nuanced understanding. Identifying and addressing these aspects is crucial for refining the applicability and effectiveness of the metrics in diverse organisational contexts.

Introducing qualitative metrics brings forth the challenge of standardisation. Unlike quantitative metrics that provide clear numerical benchmarks, qualitative metrics often involve subjective interpretations. Standardising the evaluation of innovation culture or experimentation tolerance across diverse organisational structures and industries poses a formidable challenge. Developing clear definitions and assessment guidelines becomes imperative to ensure consistent and meaningful interpretation.

The innovation landscape is inherently dynamic, with constant shifts in technology, market demands, and organisational strategies. The table may not fully capture the evolving nature of innovation, especially concerning emerging trends or disruptions. Metrics designed to assess adaptability and responsiveness to industry changes could enrich the table, providing organisations with a proactive toolset to navigate evolving innovation landscapes.

The metrics table provides a generic framework applicable across various industries. However, the unique characteristics and challenges of specific industries may necessitate industry-specific metrics. Tailoring the metrics to align with the peculiarities of different sectors could enhance their relevance and applicability, ensuring organisations measure what truly matters in their particular context.

The integration of innovation metrics within organisational contexts is a nuanced endeavour fraught with potential complications. One prominent complexity lies in the potential misalignment between established organisational culture and the metrics proposed for innovation assessment. The adoption of metrics that necessitate risk-taking and experimentation

may encounter resistance in environments where conservatism and risk aversion prevail. Introducing these metrics successfully demands a careful alignment with existing cultural values or a gradual cultivation of a culture conducive to innovation.

Organisations, by their nature, tend to resist significant changes, and the incorporation of innovation metrics represents a departure from conventional performance indicators. The entrenched reliance on traditional metrics may evoke resistance from both employees and leadership. Effectively managing this resistance requires adept change management strategies, including transparent communication, comprehensive training initiatives, and a demonstrable portrayal of the tangible benefits of integrating innovation metrics.

Innovation metrics often hinge on qualitative assessments, introducing a layer of ambiguity and subjectivity. Metrics such as “The evaluation of leadership effectiveness” may lack universally accepted definitions. This ambiguity in metric definitions poses challenges to accurate interpretation and compromises the reliability of the collected data. Establishing clear and standardised definitions for qualitative metrics is crucial to ensure consistency and facilitate meaningful analysis.

There exists a risk of overemphasising short-term, easily measurable metrics over those indicative of long-term innovation success. The allure of immediate financial gains or project milestones might divert attention from the deeper, transformative aspects of innovation. Striking a balance between short-term and long-term metrics becomes essential for fostering sustained innovation aligned with the overarching goals of the organisation.

The introduction of diverse metrics may inadvertently lead to the creation of isolated measurement silos within the organisation. Different departments or teams might prioritise specific metrics without considering their interplay and cumulative impact. This siloed

approach impedes a holistic understanding of innovation and compromises the organisation's ability to leverage synergies across diverse initiatives. Establishing cross-functional collaboration and ensuring a unified vision of innovation metrics is pivotal to mitigate this challenge.

The implementation of innovation metrics may unintentionally incentivize undesirable behaviours. For instance, if success is primarily tied to the sheer quantity of ideas generated, employees might prioritise quantity over quality. It is imperative to meticulously design metrics to align with the organisation's innovation goals and values, avoiding unintended consequences that could undermine the desired innovation culture.

Quantitative metrics, such as “The percentage of the budget allocated to high-risk projects”, may pose dilemmas in resource allocation. While acknowledging the importance of innovation, organisations must balance risk with financial prudence. Overcommitting resources to high-risk projects without a comprehensive risk management strategy may lead to financial strain. Striking the right balance in resource allocation necessitates careful consideration of the organisation’s risk tolerance and financial objectives.

In conclusion, while these innovation metrics offer a promising framework for assessing and enhancing innovation within organisations, the journey of introducing these metrics is riddled with complexities. Addressing issues related to cultural misalignment, resistance to change, lack of clear definitions, avoiding short-term biases, preventing metric silos, managing unintended behavioural consequences, and navigating resource allocation dilemmas are critical components of a well-rounded strategy for the successful integration of innovation metrics. Organisations that navigate these complications effectively stand poised to unlock the transformative potential of innovation metrics while mitigating potential pitfalls.

Effectively introducing innovation metrics within the intricate fabric of organisational structures requires a nuanced approach that considers the diverse facets of corporate culture, employee dynamics, and strategic objectives. This text elucidates several key strategies to navigate the complexities and ensure a seamless integration of innovation metrics.

Successful integration hinges on aligning innovation metrics with overarching organisational goals and values. Metrics should reflect and reinforce the strategic direction of the company, ensuring that employees perceive them as integral to achieving broader objectives. Clearly articulate how innovation metrics contribute to the realisation of the organisation's mission, fostering a sense of purpose and alignment.

To mitigate resistance and enhance understanding, organisations should invest in comprehensive training programs and transparent communication strategies. Employees at all levels need to comprehend the rationale behind the chosen metrics, their role in organisational success, and the potential benefits. Training should extend beyond mere metric comprehension to include skill development, ensuring that employees possess the capabilities required to contribute meaningfully to innovation initiatives.

Rather than implementing innovation metrics organisation-wide from the outset, consider initiating pilot programs in specific departments or teams. This phased approach allows for iterative refinement based on real-world feedback and insights. Pilot programs serve as invaluable testing grounds, enabling organisations to gauge the effectiveness of chosen metrics, identify potential challenges, and tailor the implementation strategy accordingly.

Innovation is a collaborative endeavour that transcends departmental boundaries. Organisations should actively foster cross-functional collaboration to ensure a holistic approach to innovation metrics. Cross-departmental teams can share insights, leverage diverse perspectives, and contribute to a more comprehensive understanding of innovation within the

organisation. Encouraging collaboration breaks down silos and ensures that innovation metrics consider the multifaceted nature of organisational dynamics.

The potential ambiguity associated with qualitative metrics underscores the importance of establishing clear and standardised definitions. Clear definitions enhance the reliability and consistency of data interpretation across the organisation. Organisations should invest in developing a shared lexicon for qualitative metrics, accompanied by training initiatives to ensure a uniform understanding among all stakeholders.

Incentive structures play a crucial role in shaping employee behaviour. Organisations should align incentives with desired behaviours that contribute to innovation goals. This could involve recognising and rewarding not just the quantity but the quality of ideas generated. Incentives should be transparent, equitable, and designed to motivate employees to actively engage in innovation initiatives.

The dynamic nature of both organisations and the business landscape necessitates a commitment to continuous evaluation and adaptation. Regularly assess the effectiveness of innovation metrics, seeking feedback from employees, monitoring key performance indicators, and making iterative adjustments as needed. Flexibility and responsiveness to changing circumstances ensure that innovation metrics remain relevant and impactful over time.

3. Methodology

This research employs a qualitative approach to explore innovation practices across different sectors, focusing on the key themes of Idea Management, Innovation Governance, and Metrics. The study is based on semi-structured interviews with industry professionals, aimed at uncovering best practices, challenges, and sector-specific practices to foster innovation.

The qualitative research design was chosen to gain in-depth insights into the practices and challenges associated with innovation within different sectors. Semi-structured interviews were conducted to allow for flexibility in exploring various aspects of innovation while ensuring that key themes identified in the literature review were adequately covered.

The interviews were structured around the three main themes derived from the literature review: Idea Management, Innovation Governance, and Metrics. Each interview began with asking some questions regarding their person and job position and concluded with an open-ended question about the participant's views on the biggest challenges to innovation in their sector. All interviews were recorded, transcribed, and - if needed - translated into English for a detailed analysis.

The analysis began with an initial surface-level review to identify recurring themes and patterns across the interviews. A coding scheme was then developed based on the themes from the literature review, which was systematically applied to the interview data. The findings from the interviews, analysed in the chapter "Data Analysis", are compared against the literature in the chapter "Discussion of Findings" to identify consistencies, discrepancies, and potential gaps in the current understanding of innovation practices.

To ensure the reliability and validity of the research, a systematic coding process was employed, and findings are cross-referenced with the existing literature. Confidentiality of the

participants was maintained throughout the study, with all interviews anonymised during analysis.

4. Data

In this chapter, the collected data from interviews with industry professionals is analysed to explore the various innovation practices within different sectors. This analysis aims to address the research objectives of identifying key practices used to foster innovation. The data, which includes insights from ten interviews across diverse industries, provides a rich basis for understanding the nuances of innovation management.

The analysis is structured to align with the key themes identified in the literature review, focusing on three main areas: Idea Management, Innovation Governance, and Metrics. By organising the analysis in this way, the study enables a detailed comparison between the practices observed in the interviews and the theoretical frameworks discussed earlier. This structured approach facilitates a thorough examination of the patterns and trends that emerge from the participants' experiences, allowing for a nuanced understanding of how these innovation practices are implemented across different organisations.

By systematically exploring these themes, this chapter will uncover the underlying drivers of successful innovation practices and highlight the challenges faced by organisations in different sectors. The findings presented will contribute to a deeper understanding of how innovation is managed across various contexts, setting the stage for the discussion and implications outlined in the subsequent chapter.

Before delving into the analysis of the interview data, it is important to outline the structure and focus of the questionnaire used to gather insights from industry professionals which can be found in Appendix 7.2.1 "Questionnaire for my master thesis". The questionnaire was designed to explore a broad range of innovation practices within different sectors, with questions carefully crafted to align with the key themes identified in the literature review: Idea Management, Innovation Governance, and Metrics.

The first section of the questionnaire focused on gathering demographic information from the participants. This included questions about nationality, age, role within the organisation, leadership responsibilities, years of experience within the organisation they are currently working in, and the industry in which their organisation operates. Understanding the demographic background of the participants was crucial for contextualising their responses and ensuring a diverse range of perspectives were included in the analysis.

The second section of the questionnaire delved into the core aspects of organisational innovation. Participants were asked to describe what innovation means within their company and to identify the key priorities from an innovation perspective. This section also explored specific practices or strategies employed by their organisations to foster innovation, such as mechanisms for generating, mapping, collecting, selecting, and rejecting ideas.

Furthermore, the questionnaire investigated how these organisations handle experimentation, execution, and adaptation of ideas and projects. Questions about the use of (agile) frameworks, opportunities for testing and improving ideas, and the evaluation of innovation success through key performance indicators (KPIs) were included to gain a comprehensive understanding of the innovation processes.

Communication, both internal and external, was another critical aspect explored in this section. Participants were asked about the openness of communication channels within and outside their organisations, as well as the roles specifically dedicated to supporting innovation. Additionally, the questionnaire addressed the use of incentives to encourage innovative practices and the benefits these practices have brought to the company.

The insights gathered through these questions form the foundation of the detailed thematic analysis that follows. By structuring the analysis around the responses to these questions, this chapter will provide a nuanced examination of how different organisations approach

innovation, highlighting both successful practices and common challenges. This approach not only facilitates a direct comparison with the literature but also ensures that the analysis is grounded in the real-world experiences of industry professionals.

4.1. Data Collection

The primary purpose of data collection in this study was to gain practical insights from professionals involved in innovation within their respective fields. These insights were intended to be compared with the information gathered from the literature review, providing a basis for a comprehensive analysis.

The data collection was closely aligned with the research questions. For RQ1: What are the key dimensions of organisational innovation, and how do they impact overall business success?, the data allows for an examination of which innovation dimensions are applied in practice and how they differ from the literature, as well as their relationship with the success of the organisations involved. RQ2: What innovation practices are currently utilised by organisations, and which additional practices could be implemented to enhance innovation? directly connects to the study's goal of identifying the innovation practices and strategies currently in use. RQ3: How can the success of innovation initiatives be effectively measured and assessed within organisations? examines which metrics are used in practice to evaluate innovation success and how these compare to those discussed in the literature.

For this study, semi-structured interviews were chosen as the data collection method. This approach was selected because it allows for the acquisition of practical insights from professionals actively engaged in innovation within their organisations, facilitating a meaningful comparison with the theoretical perspectives identified in the literature review. In the following paragraphs, more anonymised information will be provided for each interviewed person and the companies they are working in.

Company A

Company A is one of the world's leading automobile manufacturers, headquartered in Germany. Founded in the late 1930s, Company A has grown to become a global automotive driving force, producing a wide range of vehicles from compact cars to luxury models. The company is also a pioneer in the electric vehicle market and is deeply invested in sustainability and innovation within the automotive industry.

Interviewee 1

Interviewee 1 is a seasoned specialist in the Research and Development department at Company A, where they have accumulated over three decades of experience. With leadership responsibilities across six different departments, the interviewee plays a crucial role in overseeing key aspects of the company's R&D efforts. The interview provided valuable insights into the challenges and innovation practices within the automotive industry, particularly in the areas of research and development.

Interviewee 2

Interviewee 2 is a Design Engineer working in the Research and Development department at Company A, with nine years of experience in the automotive industry. While they do not hold disciplinary leadership responsibilities, they play a critical role in contributing to the development and implementation of innovative processes within the company. The interview highlighted the importance of agility and customer focus in their work, as well as the integration of feedback loops to continuously improve products and processes. This approach helps the company adapt to market demands and maintain a competitive edge.

Interviewee 3

Interviewee 3 is a Designer in Instrument Panel Development within the Research and Development department at Company A, with nearly a decade of experience in the automotive industry. While they do not hold disciplinary leadership responsibilities, they have technical management duties, overseeing the design and development of vehicle interiors, focusing particularly on the instrument panel. Their work involves balancing ecological and economic priorities, ensuring that designs are both environmentally responsible and economically viable. The interview provided insights into the complex challenges of balancing ecological and economic priorities in the development of automotive interiors. The interviewee highlighted the difficulty of integrating environmentally sustainable materials while ensuring that the designs remain cost-effective, a process that often involves difficult trade-offs between environmental responsibility and economic viability.

Company B

Company B is a family-owned logistics company based in Germany, specialising in comprehensive supply chain solutions. Established several decades ago, the company has grown into a leader in the logistics industry, known for its efficiency and reliability in managing complex operations. Company B offers a wide range of services, including warehousing, transportation, and digital supply chain management, catering to clients across various industries. The company is also committed to sustainability, continually seeking to reduce its environmental impact while upholding high standards of service.

Interviewee 4

Interviewee 4 is an HR System Specialist at Company B. With four years of experience at the company, including two years in their current role, the interviewee is responsible for managing and maintaining the personnel system. Their tasks include troubleshooting system errors, coordinating with external service providers, and ensuring the smooth operation of the HR system. The interview provided valuable insights into the challenges of driving innovation within the HR systems of a logistics company. It highlighted the importance of engaging with both internal and external stakeholders to implement new ideas effectively, such as through the company's Kaizen initiative and feedback loops with system manufacturers. The discussion underscored the complexities of fostering innovation in a dynamic environment where system limitations and the need for swift problem resolution can impede progress, making the interview particularly valuable for understanding how innovation can be both supported and hindered in such a setting.

Interviewee 5

Interviewee 5 is a Digital HR Transformation Expert at Company B, with over a year of experience in overseeing digitisation projects within the HR department in this organisation. Their role involves acting as an interface between HR and IT, ensuring that digitisation and automation initiatives align with the broader company-wide strategies dictated by the IT department. The interview provided valuable insights into the complexities of driving digital innovation in a traditionally process-oriented environment. It highlighted the challenges of replacing long-established processes with new, more efficient digital solutions while ensuring that these are practical and user-friendly for colleagues. The discussion underscored the importance of balancing innovative ideas with the need for feasible and efficient solutions, making it clear that successful innovation in this context hinges on aligning new digital processes with existing strategies and gaining workforce acceptance.

Company C

Company C is a municipal administration in Germany, responsible for managing a wide range of public services, including urban planning, infrastructure development, and community services. The administration plays a crucial role in overseeing the city's growth, ensuring that public resources are efficiently allocated and that the needs of residents are met. With a focus on sustainability and innovation, Company C is committed to improving the quality of life in the city while navigating the challenges of modern urban governance.

Interviewee 6

Interviewee 6 is the Department Head of Facility Management at Company C, with 40 years of experience within this organisation, including five years in their current role. Their primary responsibilities include overseeing building maintenance, managing the cafeteria, print shop, mailroom, and the testing of electrical equipment across all city administration buildings, schools, and daycare centres. The interview provided valuable insights into the challenges of maintaining critical infrastructure in a municipal context, where the focus is on ensuring smooth operations despite resource constraints. Additionally, it highlighted the importance of continuous innovation within the constraints of public sector regulations, particularly in areas such as digitalization, sustainability, and safety.

Company D

Company D is a major player in the construction and engineering sector, based in Chile, and specialises in providing integrated solutions for large-scale infrastructure projects. With a strong presence in multiple countries, Company D focuses on delivering innovation through its use of advanced digital tools and collaboration with specialised teams. The company's approach to project management emphasises the importance of rigorous experimentation and

adaptability, particularly in large, complex projects that require continuous adjustment to evolving goals and conditions.

Interviewee 7

Interviewee 7 is a Project Manager at Company D, with four years of experience in the information technology sector. Their responsibilities include overseeing project planning and execution, ensuring timely delivery, and managing resource allocation across various projects. Leading a multidisciplinary team, the interviewee focuses on balancing project scope with available resources while maintaining high-quality standards. The interview provided valuable insights into the challenges of managing complex IT projects in a fast-paced environment, where the ability to adapt quickly and learn from failures is crucial. The discussion also highlighted the importance of fostering a culture of innovation, with practices like “Fail Fast, Learn Fast” and regular “Design Thinking” sessions playing a significant role in driving the company's success in the competitive IT industry.

Company E

Company E is a leading company in the construction industry, specialising in advanced timber engineering and construction solutions. Based in Germany, the company is renowned for its expertise in using timber as a primary material for innovative and sustainable building projects. Company E offers a wide range of services, including the design, engineering, and construction of timber structures, often for large-scale commercial and public projects. With a strong commitment to sustainability, the company is at the forefront of promoting the use of renewable materials in construction, combining traditional craftsmanship with modern

technology to deliver high-quality, eco-friendly buildings. Their work emphasises the importance of sustainability, precision, and innovation in the construction industry.

Interviewee 8

Interviewee 8 is a senior employee at Company E, with 26 years of experience working within this company. Their responsibilities include overseeing one of the company's main business areas, ensuring smooth operations, and managing both sales activities and process development. This role also involves the critical task of international project acquisition. The interview was particularly insightful for understanding innovation practices within the construction industry. The interviewee emphasised the importance of adapting to market fluctuations and evolving demands, which requires continuous innovation in both business processes and project management strategies. They discussed the challenges of leading a diverse team, particularly in integrating innovative solutions that respond to new market conditions, such as shifts in demand for single-family homes and the need to develop new services and products.

Company F

Company F is a leading agricultural enterprise based in Germany, specialising in the trading and processing of various grains. The company is recognised for its innovative approach to grain marketing, particularly through strategies designed to help farmers manage market volatility. Additionally, the company collaborates with industry experts to provide farmers with detailed market insights and strategic advice, further enhancing their ability to make informed decisions. These initiatives reflect Company F's commitment to supporting sustainable farming practices and improving the profitability of its agricultural partners.

Interviewee 9

Interviewee 9 holds a dual role as both a Sales Team Leader at Company F and an independent farmer, offering a unique perspective on innovation within the agricultural sector. With 21 years of experience working within the company, they manage a small team. The interview provided valuable insights into the innovative practices emerging in modern agriculture, particularly in response to market volatility and increasing regulatory pressures. The interviewee highlighted how the agricultural sector, traditionally viewed as conservative, is increasingly adopting innovative approaches to tackle these challenges. Furthermore, the interview highlighted how farmers are at the forefront of adopting new agricultural techniques and technologies, such as the shift towards no-till farming, which reduces soil erosion and enhances sustainability. Overall, the discussion underscored the dynamic nature of innovation in agriculture, driven by the need to adapt to both market and environmental challenges. The interviewee's insights illustrated how these innovations not only support the agricultural community but also contribute to the broader goal of sustainable farming.

Company G

Company G is a dynamic organisation based in Europe, specialising in fostering innovation and supporting start-up ecosystems. With a strong focus on accelerating the growth of new ventures, Company G collaborates with a wide range of partners, including corporations, academic institutions, and public bodies, to drive innovation across various sectors. The company is particularly known for its programmes that bridge the gap between start-ups and established businesses, offering resources, mentorship, and networking opportunities to help new ventures scale and succeed. By leveraging its extensive network and expertise, Company

G plays a crucial role in nurturing innovation and entrepreneurship, contributing to the development of a vibrant and sustainable start-up ecosystem.

Interviewee 10

Interviewee 10 is an Innovation Manager at Company G, responsible for driving innovative projects across various industries. They are working at this company for three years. Their role includes promoting entrepreneurship within corporations, helping employees develop their ideas into startups through targeted training programs. The interview highlighted the challenge of shifting corporate mindsets to embrace startup thinking, and the importance of using methodologies like design thinking to develop and test minimum viable products (MVPs). The discussion also emphasised the need for clear strategies and KPIs to align innovation projects with corporate goals. The interviewee's expertise in fostering innovation across different sectors, managing diverse teams, and aligning innovation strategies with corporate goals made them particularly relevant, providing valuable insights into the practical application of innovation management practices.

Data collection was conducted using a semi-structured questionnaire. The interviews took place either in person or online via Zoom or Teams, with a planned duration of approximately 30 minutes. The actual interviews ranged from 20 to 42 minutes, with an average length of 33 minutes. All interviews were recorded, either via mobile phone voice recorder or Zoom’s cloud recording function. The recordings were then transcribed, coded using Atlas.ti, and analysed.

To provide a comprehensive overview of the individuals who contributed to this study, the following table summarises key details about each interviewee, including their nationality, age, position, area of expertise, leadership responsibilities, years of experience, and the company and industry they represent. This summary serves to contextualise the diverse perspectives and

insights gathered during the interviews, which form the basis of the analysis presented in this work.

Table 6: Overview of Interview Participants

Interview number	Nationality	Age	Position	Area	Leadership responsibility	Working experience[2]	Company	Industry	Length
1	German	53	Specialist	Research and Development	Yes	31	Company A	Automotive	00:26:14
2	German	36	Design Engineer	Research and Development	No	9	Company A	Automotive	00:19:40
3	German	56	Designer in Instrument Panel Development	Research and Development	No	9	Company A	Automotive	00:28:01
4	German	22	HR System Specialist	Human Resources	No	4	Company B	Logistic	00:37:08
5	German	42	Digital HR Transformation Expert	Human Resources	No	1	Company B	Logistic	00:31:11
6	German	58	Department Head	Facility Management	Yes	40	Company C	Municipal administration	00:36:38
7	Peruvian	35	Project Manager	Project Management	Yes	4	Company D	Construction & Engineering	00:28:21
8	German	55	Senior Employee	Wood Construction	Yes	26	Company E	Construction	00:41:55
9	German	50	Team leader in sales & independent farmer	Sales	Yes	21	Company F	Agriculture	00:40:14
10	Italian	33	Innovation Manager	Innovation Management Consulting	Yes	3	Company G	Agnostic	00:35:08
Average		**44**				**14.8**			**00:33:08**

[2] Referring to the working experience within the company the interviewees are currently working in

Ethical considerations were carefully addressed. Consent to record the interviews was obtained before each session, and participants were informed about the process and the measures taken to ensure their privacy. No personal information or identifiable details about the participants or the organisations they work for are mentioned in this study. Additionally, participants were given the opportunity to specify which information they were comfortable sharing and which they preferred to keep confidential.

Several challenges were encountered during data collection. In some instances, participants had difficulty understanding English, and the quality of some recordings made it challenging to create accurate transcripts. To address these issues, follow-up queries were made to clarify statements. On top of that, the problem concerning understanding English could be solved by conducting the interview in German in most cases. Additionally, technical issues such as internet connectivity problems were encountered. In such cases, the interview was paused until the issue was resolved, and then continued as planned. Flexibility in scheduling allowed these issues to be managed effectively.

Once collected, the interview data was transcribed and subsequently coded in Atlas.ti. The coded data was then exported to an Excel file, where it was sorted by codes and analysed for common themes, differences, trends, and other relevant patterns.

4.2. Data Analysis

In an increasingly competitive global landscape, innovation has become a critical determinant of organisational success. This subchapter delves into the multifaceted aspects of innovation management across various industries, exploring how different sectors approach the processes of idea management, innovation governance and metrics. By analysing the various factors that drive innovation, this chapter aims to provide a comprehensive understanding of the practices, strategies and tools that organisations employ to foster creativity, enhance productivity, and achieve long-term growth. The analysis is grounded in data from ten in-depth interviews with professionals across different sectors, providing real-world insights into how these concepts are applied in practice. Through a detailed examination of sector- and company-specific practices, this subchapter highlights the similarities and divergences in innovation management. The individual codes gathered from the ten interviews are linked in *Appendix 7.2.2 Link to Codes used in my Master Thesis*.

4.2.1. Idea Management

Idea management, encompassing stages such as idea generation, mapping, selection, evaluation, and rejection, is fundamental to the development and growth of organisations. While these stages are common across industries, the methods and emphasis placed on each vary significantly, reflecting the unique challenges and priorities inherent in each sector. This analysis explores how these processes are handled in the automotive, agriculture, construction, logistics, and other sectors, highlighting both shared practices and distinct approaches.

Idea Generation

Idea generation marks the initial stage where new concepts are conceived. However, the approach to generating ideas varies widely between industries, shaped by external pressures, internal cultures, and the specific nature of each sector.

In the automotive and municipal sectors, idea generation is largely driven by the necessity to comply with stringent regulatory demands. Organisations must consistently anticipate future legislative changes and develop ideas that align with these requirements. As Interviewee 1 noted, innovation is often "[...] linked to the EU, with legislation, [where] we look at current and future laws, what product developments might be required, and what will emerge." (ID: 1:20). This underscores a systematic approach where innovation is closely tied to regulatory compliance.

In contrast, the logistics sector's idea generation is closely tied to practical needs and operational efficiency. In Company B, regular meetings and brainstorming sessions are integral, ensuring that ideas generated are not only innovative but also directly applicable to ongoing projects (ID: 3:30, 3:32). Company D, operating in a sector characterised by rapid technological advancement, focuses on cultivating creativity and collaboration within structured environments. For example, Interviewee 7 mentioned "[...] Monthly 'Design Thinking'" sessions where interdisciplinary teams tackle specific customer challenges" which are crucial in stimulating the flow of new ideas (ID: 4:16). Meanwhile, Company E takes a more structured approach to idea generation, closely linked to the immediate demands of ongoing projects. Company E relies on regular team discussions and internal platforms to facilitate the exchange of ideas, ensuring that innovation is practical and relevant to current work (ID: 5:15, 5:16).

Idea Mapping

After ideas are generated, they must be organised and assessed – a process known as idea mapping. This step is essential for visualising relationships between ideas and identifying those with the most potential for development.

In Company D, idea mapping is highly digital and systematic. Tools like Miro are used to create collaborative mind maps, categorising ideas by technical feasibility, potential impact, and alignment with customer goals (ID: 4:17). The process involves collaboration and structured sessions to ensure ideas are developed in a coherent and organised manner (ID: 4:23).

Conversely, Company B integrates idea mapping into regular team meetings, where ideas are discussed and evaluated in small, focused groups. This method, though less reliant on digital tools, is thorough and ensures that ideas are well-aligned with operational needs before moving forward (ID: 6:18). Similarly, Company C relies on regular team discussions for idea mapping, ensuring that ideas are collaboratively assessed and aligned with practical and implementable solutions (ID: 8:24, 8:33).

In Company A, idea mapping is a collaborative effort focused on technical discussions. Teams jointly develop and explore ideas, ensuring that every aspect is considered before proceeding, similar to the structured, team-based approach seen in Company B (ID: 9:18).

Idea Evaluation

Following idea mapping, the evaluation process becomes crucial for determining the feasibility, risks, and potential success of ideas. This process, though common across industries, is tailored to reflect each sector's unique demands and operational realities.

Company A's evaluation process is characterised by a highly structured approach. Ideas are validated against strict criteria such as technical feasibility, financial viability, and alignment with existing systems (ID: 1:21, 1:23, 1:36). Continuous feedback loops and management

oversight ensure that only the most viable ideas progress (ID: 2:22). This process often includes patent research and detailed scrutiny of the idea's potential impact (ID: 2:23, 2:24).

Company B adopts a more practical approach, integrating evaluation into regular team meetings. Interviewees 4 and 5 mentioned that ideas are assessed based on their potential to solve existing problems and improve efficiency (ID: 6:18, 3:61). The sector places significant value on cross-functional collaboration, supported by a culture of continuous improvement, where tools like Kaizen maintain a steady flow of actionable ideas (ID: 3:19; 3:61).

In contrast, Company D embraces a more iterative and dynamic method. Ideas are evaluated through structured sessions like "Future Fridays" and "Pitch Days", where employees present their ideas to executives and potential clients (ID: 4:20, 4:21, 4:22). This approach allows for flexibility and continuous refinement, crucial in a rapidly changing environment.

Company F's evaluation process is marked by a combination of digital tools and formal committees, ensuring a thorough assessment of ideas against strategic goals and industry constraints (ID: 5:13, 5:19). Company C, meanwhile, offers a more flexible and practical approach, where employees are encouraged to test ideas and receive ongoing feedback (ID: 8:24, 8:31).

Idea Selection

Building on the evaluation process, idea selection further refines the innovation journey, determining which concepts are advanced for development and implementation.

In Company A, idea selection is a highly structured and formalised process. Ideas are reviewed by management or specialised committees, scrutinised against stringent criteria including technical feasibility, financial viability, and compatibility with existing processes (ID: 2:55, 9:17). This top-down approach ensures that only the most promising ideas are pursued (ID: 2:57, ID: 2:58).

Company B, while maintaining structure, places greater emphasis on practicality and immediate application. Ideas are quickly evaluated based on their potential to solve operational challenges, with input from various organisational levels, allowing for a broader perspective (ID: 3:61, ID: 6:18, ID: 6:15).

Company D's approach to idea selection is notably iterative and dynamic, with continuous input from internal teams and external stakeholders (ID: 4:22). In Company E, idea selection involves formal committees and digital tools, ensuring alignment with long-term objectives (ID: 5:19). Company C takes a more flexible approach, prioritising practical outcomes over rigid selection criteria (ID: 8:31, ID: 8:24, ID: 8:25).

Idea Rejection

The process of idea rejection is crucial in ensuring that only the most viable and strategically aligned ideas proceed. However, this process is handled differently across companies, reflecting each industry's specific operational realities.

In Company A, idea rejection often arises from challenges related to technical feasibility and internal alignment (ID: 1:28, 1:29). The industry's strict focus on long-term goals often leads to the shelving of innovations that do not align with the current strategic framework (ID: 1:26, 1:30).

In contrast, Company D focuses on learning and continuous improvement through "'Failure Feedback' sessions where teams analyse what went wrong and identify lessons learned" (ID: 4:15, 4:14). Company E combines structured evaluation with a cultural encouragement to experiment and learn from failures, promoting a mindset where failure is not stigmatised but seen as a step towards success (ID: 5:23).

In Company C, idea rejection is often influenced by practical and regulatory constraints. Ideas that do not align with regulatory requirements or practical needs are typically dismissed

(ID: 8:37). Company E also shows how idea rejection is intertwined with continuous improvement, where rejected ideas may be revised and revisited rather than completely discarded (ID: 5:13, 5:23).

The analysis of generating, mapping, evaluating, selecting and rejecting ideas across various industries reveals significant differences, each shaped by the unique operational demands and strategic goals of the respective sectors.

In highly regulated industries like automotive and municipal administration, idea generation and subsequent stages are predominantly driven by the need for compliance with stringent regulatory requirements. This often results in a systematic approach where innovation is closely aligned with external legislative demands. Conversely, sectors such as construction and engineering and logistics, which operate in rapidly changing or highly practical environments, emphasise flexibility, iterative processes, and immediate applicability. Here, innovation is spurred by internal creativity and collaborative efforts, with a strong focus on operational efficiency and practical problem-solving.

Idea mapping and evaluation processes further highlight these distinctions. Company D's reliance on digital tools and structured sessions contrasts with the more traditional, collaborative methods seen in Company B and Company C. Company A's structured evaluation approach underscores its focus on precision and long-term strategic alignment, while the construction sector balances digital and formal processes to ensure ideas are both innovative and feasible.

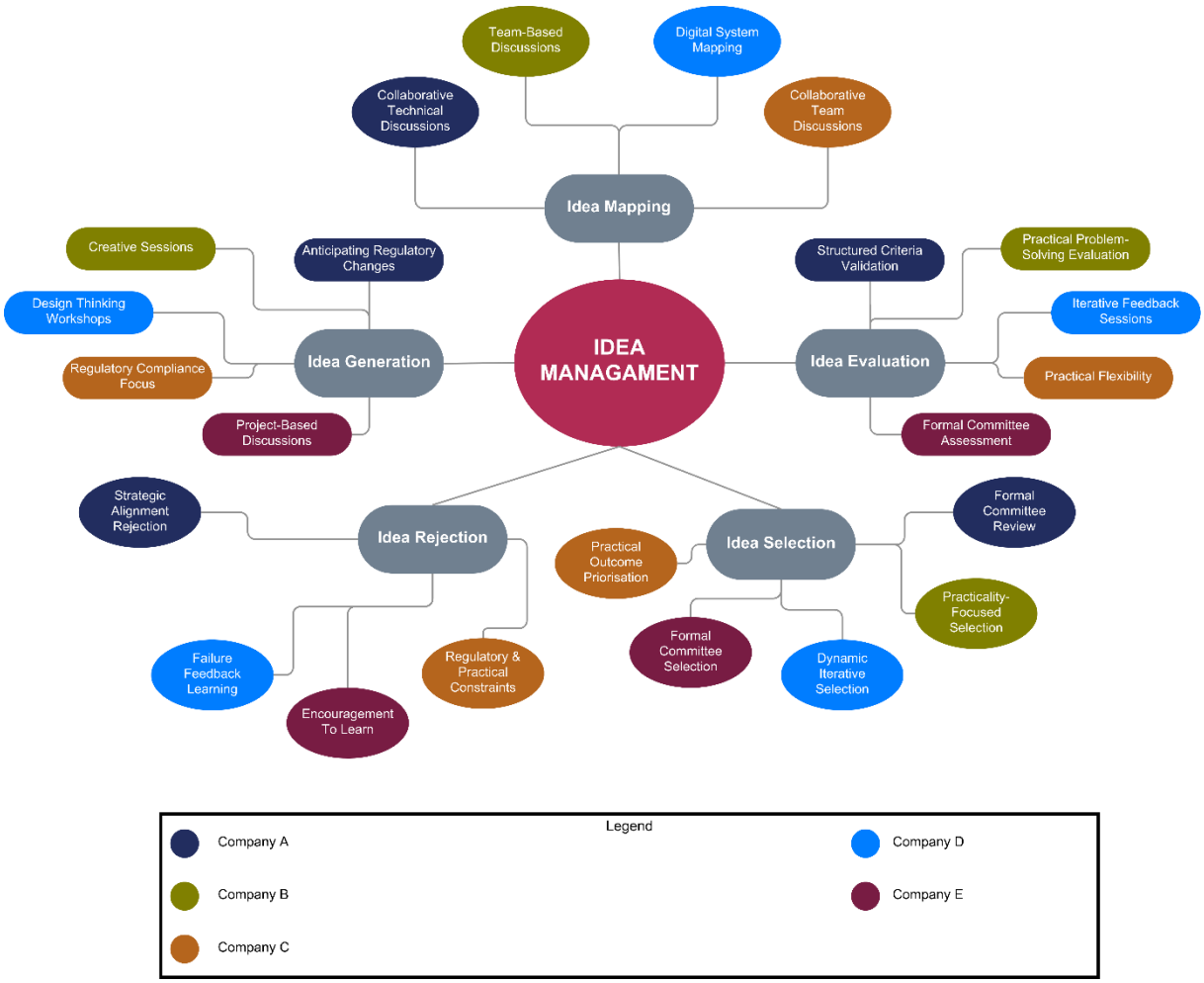
Idea selection across these companies reflects a similar diversity, with more formalised, top-down processes in Company A and Company E, compared to the dynamic, feedback-driven methods in Company D and Company B. The process of idea rejection further amplifies these

differences, where some companies, like Company D, use rejection as an opportunity for learning and improvement, while others, such as Company A, prioritise alignment with long-term goals, leading to the dismissal of ideas that do not fit the strategic framework.

Overall, these variations underline the importance of tailoring idea management practices to the specific needs and challenges of each industry, ensuring that innovation not only thrives but also aligns with the broader operational and strategic context.

The innovation practices discussed in this analysis are visually summarised in Figure 1, which illustrates the different stages of idea management - generation, mapping, evaluation, selection, and rejection - across various industries. This diagram highlights the specific practices employed by each sector, providing a clear overview of how innovation is cultivated and managed.

Figure 1: Innovation Practices Across Industries in the Idea Management Process



Experimentation, Execution, Adaptation

Experimentation, execution, and adaptation represent critical phases in the innovation process, where ideas are transformed into tangible products, services, or processes. These stages follow the earlier phases of idea generation, mapping, evaluation, selection, and rejection, building on the foundation of screened and refined ideas to bring them closer to real-world application. These stages involve rigorous testing, refinement, and scaling, and the approach to these activities varies significantly across different industries, reflecting their unique operational demands and strategic priorities.

In Company A, the process of experimentation and execution is meticulously structured. There is a clear progression from prototype development to serial production, ensuring that all concepts are thoroughly vetted for robustness and viability before they are implemented on a larger scale (ID: 1:38, 1:39, 1:40). For instance, company A often uses pilot projects to explore and validate new frameworks, such as agile methodologies (ID: 2:28). The emphasis is on ensuring that technical and practical aspects are fully validated, reducing the risk of failure during full-scale deployment.

Company B takes a pragmatic approach, where experimentation is conducted within controlled environments that minimise disruption to core operations. Interviewee three discussed typically maintaining both real and test systems, allowing them to trial new ideas without the risk of damaging essential functions (ID: 3:33, 3:34). Feedback is a critical component of this process, with direct input from innovation feedback channels playing a key role in refining and adapting processes (ID: 3:35). Furthermore, the iterative nature of logistics projects means that adaptations are frequently necessary in Company B as new data or conditions emerge, ensuring that solutions remain effective and relevant (ID: 6:20, 6:21).

In Company D, flexibility and rapid iteration are central to the experimentation and execution process. The industry is characterised by a "fail fast, learn fast" mentality, where rapid testing and feedback loops are used to quickly refine products and solutions (ID: 4:13). Agile methodologies are prevalent, with short Proof of Concepts (PoCs) and pilot projects being employed to test ideas in real-world conditions (ID: 4:26, 4:24, 4:27). Continuous feedback and the use of key metrics guide further development, allowing Company D to adapt swiftly to changes and maintain a competitive edge (ID: 4:28, 4:29). Additionally, Company D often engages clients early in the process through "Beta Client" agreements, enabling new solutions to be tested in controlled environments before broader implementation (ID: 4:30).

In Company E, experimentation is supported by access to specialised digital tools and internal support structures (ID: 5:19, 5:20). These resources are essential for the development and testing of new ideas, even when execution requires outsourcing to dedicated teams. The industry's approach to adaptation is marked by the long timelines typical of its projects, which often necessitate continuous adjustments to align with evolving goals and conditions (ID: 5:32). This iterative process is critical for managing the complex and large-scale projects that are common in construction.

Company C balances structure with adaptability in its approach to experimentation and execution. Decisions to experiment with new ideas often require approval from higher management levels, especially when the potential impact extends beyond small teams (ID: 8:29, 8:30). However, within smaller teams, there is considerable flexibility to test ideas autonomously, provided they align with broader organisational objectives (ID: 8:31). Legal and regulatory compliance is also a significant consideration during the execution phase, ensuring that all innovations adhere to the necessary standards and guidelines (ID: 8:27, 8:28).

Finally, the agricultural sector adopts a community-driven and highly collaborative approach to experimentation and adaptation. Farmers frequently test innovations independently or in

collaboration with machinery manufacturers, with rapid iterations based on practical feedback from the farming community (ID: 10:15, 10:16, 10:17). This sector values the swift transition from idea to market-ready product, facilitated by a robust network of peers and industry experts (ID: 10:18). The focus is on immediate utility, with innovations quickly adapted to meet specific needs, reflecting the sector's practical and results-oriented nature (ID: 10:22).

In conclusion, while all companies recognise the importance of experimentation, execution, and adaptation in the innovation process, the way these phases are managed varies significantly. Company A and Company E emphasise thorough validation and structured processes to ensure innovations are technically and operationally sound. In contrast, Company D prioritises flexibility and client involvement, leveraging rapid iterations and continuous feedback. Company B blends structured testing with the need for operational flexibility, while Company C carefully balances bureaucratic oversight with the need for practical experimentation. The agricultural sector, meanwhile, is distinguished by its community-driven approach, focusing on rapid prototyping and adaptation to meet immediate needs. These diverse approaches underscore the necessity of tailoring innovation practices to the specific demands and realities of each industry.

Project Review

The process of project review plays a crucial role in refining practices and improving outcomes across various industries. However, the way these processes are implemented varies significantly, reflecting the distinct operational challenges and strategic priorities of each sector.

In Company D, project reviews are structured through “Failure Feedback” sessions. These sessions focus on analysing project failures to identify what went wrong and to extract key lessons. This approach not only helps to mitigate the negative impact of failures but also fosters a culture of continuous improvement. By framing failures as learning opportunities, the construction and engineering sector encourages innovation and adaptability, aligning with its agile methodologies that emphasise iterative development and rapid adaptation (ID: 4:15).

In contrast, the Company E employs a more comprehensive approach to lessons learned, deeply embedding it within the project lifecycle. At the end of each construction project, a large-scale review is conducted, often involving a wide range of stakeholders - sometimes as many as 40 to 50 people. These sessions cover a broad spectrum of topics, from financial success to on-site safety and team dynamics, ensuring that every aspect of the project is thoroughly evaluated. This detailed review process allows the industry to continuously refine its methods and improve future project outcomes. Additionally, Company E places a strong emphasis on documentation, with extensive presentation templates and other materials being made available online for easy access and review (ID: 5:24, 5:25).

Company A integrates lessons learned not only into project reviews but also into its broader innovation management strategies. Here, the focus is on ensuring that any failures are documented and analysed to prevent the repetition of mistakes in future projects. This process is systematic, with lessons learned being used to inform both current and future projects, ensuring that foundational issues are addressed early in the development phase. This approach

highlights the importance of learning from both successes and failures to continuously improve processes and outcomes (ID: 9:41).

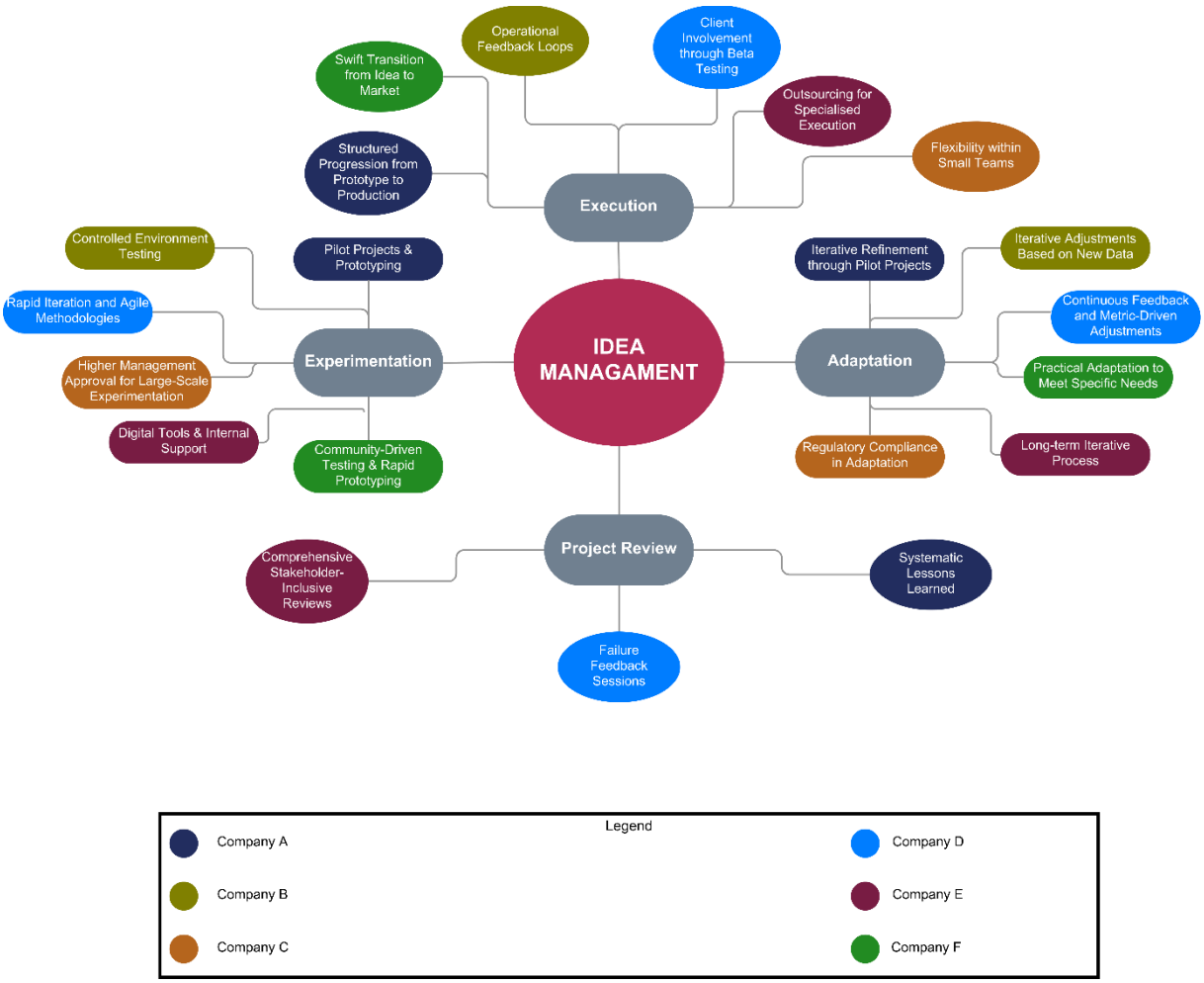
In summary, while all three industries recognise the importance of project reviews and lessons learned, their approaches reflect the distinct operational challenges and strategic priorities of each sector. Company D's focus on rapid feedback and iterative learning contrasts with Company E's comprehensive and stakeholder-inclusive review processes, while Company A blends these approaches with a strong emphasis on systematic documentation and process improvement. Each method is tailored to meet the specific needs of the industry, ensuring that lessons learned effectively contribute to future success.

The following figure illustrates the distinct innovation practices employed across various industries during the critical stages of experimentation, execution, adaptation, and project review within the broader context of idea management. Each node represents a specific practice adopted by a particular industry, highlighting how different sectors approach innovation to meet their unique operational demands and strategic goals.

The mind map visually categorises these practices by company, showcasing how the automotive, logistics, construction and engineering, construction, municipal administration, and agricultural sectors each tailor their innovation strategies to ensure effectiveness and efficiency. From the structured progression of prototypes in the automotive industry to the community-driven experimentation in agriculture, the figure encapsulates the diverse methods these industries use to innovate and continuously improve their processes.

By visualising these practices, the figure provides a comprehensive overview of how each sector navigates the challenges of bringing new ideas from concept to reality, ensuring that innovations are not only developed but also successfully implemented and refined over time.

Figure 2: Industry-Specific Innovation Practices in Experimentation, Execution, Adaptation, and Project Review



4.2.2. Innovation Governance

Effective governance is crucial in steering innovation efforts towards aligning with an organisation's strategic objectives. This section examines the various tools and methods that organisations across different industries use to manage and guide their innovation processes. By focusing on aspects such as incentives, communication, and the roles dedicated to driving innovation, this section sheds light on how companies create environments conducive to innovation while maintaining control over the direction and outcomes of their innovative efforts. The analysis also highlights the challenges and best practices in embedding innovation governance within organisational structures, ensuring that innovation is not just encouraged but systematically managed for sustainable success.

Incentives

Incentivising innovation is a crucial strategy for organisations across various industries to foster creativity, enhance productivity, and maintain a competitive edge. However, the methods and structures of these incentive systems vary widely depending on the unique demands and characteristics of each sector. This analysis compares how different industries – including the automotive, logistics, construction, and agnostic sectors – approach the challenge of motivating their employees to innovate, highlighting the strengths and focus areas of each strategy.

Company A uses a highly structured approach to incentives, focusing on formal rewards such as innovation competitions, awards, and financial bonuses. These incentives are often linked to specific achievements, such as securing patents or successfully implementing new ideas into production (ID: 1:16, 1:17, 1:18). This approach aligns with the industry's need for precision and reliability, ensuring that innovations are thoroughly vetted before they are rewarded. In addition to these formal incentives, intrinsic motivation plays a significant role in

fostering innovation at Company A. Employees are driven by a sense of self-fulfilment and the desire to make meaningful contributions to product development, with the added benefit of securing their positions within the company (ID: 2:21, 2:40). As interviewee 3 remarks, this intrinsic motivation is complemented by formal recognition, such as monetary rewards and the promotion of successful ideas, further reinforcing a culture of continuous improvement (ID: 9:16, 9:20). Together, these incentives - both extrinsic and intrinsic - motivate employees to contribute innovative ideas that can be practically applied within the industry.

In Company B, incentives are similarly structured but with a strong emphasis on recognising and rewarding the practical implementation of ideas. This sector frequently uses awards, financial bonuses, and public recognition through internal platforms to encourage innovation (ID: 3:24, 3:25, 3:26). The logistics industry places a high value on operational efficiency, and the incentive system reflects this by rewarding ideas that improve processes and enhance productivity. This approach helps to foster a culture where practical, implementable innovations are highly valued and regularly rewarded.

Company D prioritises a comprehensive incentive system that encourages innovation at all levels of the organisation. Notably, it includes prestigious awards like “Innovator of the Year”, which not only offer financial rewards but also provide significant opportunities for career advancement, such as leading strategic innovation projects (ID: 4:54, 4:55). This company’s approach to incentives is closely tied to its agile methodologies, promoting a culture of continuous improvement and rapid iteration. By linking incentives to both individual and team achievements, the company effectively fosters a collaborative environment where innovation is a key focus.

In Company E, incentives are primarily focused on financial rewards and recognition for innovative ideas that contribute to the successful completion of projects. These incentives are often tied to specific milestones within a project, reflecting the sector’s need for thorough

planning and risk management (ID: 5:14, 5:31, 5:33). Interviewee 8 also emphasises the importance of documenting and sharing successful innovations through internal platforms, ensuring that the lessons learned from each project can be applied to future work.

Company G adopts a more flexible and personalised approach to incentives. In this company, incentives are aligned closely with the innovative projects of employees and can include not only monetary rewards but also opportunities for career growth, such as leading new divisions or gaining equity in new ventures (ID: 7:24). This approach recognises the diverse motivations of employees and offers a range of incentives that cater to individual preferences and career aspirations. By integrating incentives with employee development and training, the company fosters a culture where innovation is closely linked to personal and professional growth, encouraging employees to take ownership of their ideas and drive them forward.

While all companies recognise the importance of incentivising innovation, the methods employed vary significantly. Company A and Company B favour structured, formal incentives that reward practical, implementable ideas, aligning with their operational needs. Company D combines financial rewards with career advancement opportunities, promoting a culture of rapid iteration and continuous improvement. Company E ties incentives to project milestones, emphasising thorough documentation and risk management. In contrast, Company G offers a flexible, personalised approach to incentives, aligning rewards with individual career growth and development, which is particularly effective in dynamic and diverse environments. This comparison highlights the importance of tailoring incentive strategies to the specific demands and characteristics of each industry, ensuring that they effectively motivate employees to contribute to the organisation's innovative efforts.

Internal and External Communication

The analysis of communication and innovation practices across various industries reveals distinct approaches that reflect the unique needs and operational contexts of each sector. These differences are particularly evident in how companies manage internal and external communication channels, collect ideas, and approach the process of experimentation, execution, and adaptation.

In Company A, communication is characterised by a highly structured and formalised approach. Internal communication within departments involved in product development and manufacturing is tightly integrated, with frequent meetings and working groups dedicated to sharing innovations and solutions (ID: 1:44, 1:49, 1:50). External communication is also present but tends to be more formalised, with strict protocols in place to maintain confidentiality and security (ID: 9:27). The innovation process in this industry emphasises rigorous vetting and thorough planning before implementation, reflecting the need for precision and reliability in automotive production (ID: 9:32).

By contrast, Company B combines both formal and informal communication practices. Regular internal meetings and workshops play a crucial role in discussing new ideas and resolving operational issues (ID: 3:52, 3:53). Interviewee 5 talked about digital platforms that are utilised for idea collection, though engagement can vary based on cultural factors within different regions (ID: 6:24). External communication in Company B is pragmatic and focused on maintaining operational efficiency through scheduled meetings with manufacturers and service providers (ID: 3:50, 3:51). The sector's approach to innovation is practical and continuous, emphasising operational improvements through iterative problem-solving (ID: 6:26).

Company D stands out for its dynamic and agile communication environment. Internal communication is facilitated by informal channels such as “InnovAI Café”, which promote cross-departmental exchange of ideas in a less formal setting (ID: 4:49). External communication is equally significant, with the industry frequently organising public hackathons that invite collaboration with the broader tech community (ID: 4:50). This open approach is central to the sector’s innovation process, which is characterised by rapid experimentation and quick adaptation to new technologies and market demands (ID: 4:48).

In Company E, communication relies heavily on digital platforms that resemble social media networks, enabling widespread information sharing and collaborative problem-solving across the company (ID: 5:26). While external communication is present, it is less emphasised compared to internal channels (ID: 5:27). The innovation process in Company E is focused on leveraging digital tools to improve project efficiency, but the industry’s approach to adopting new practices tends to be more conservative and slower due to the large scale and long timelines of its projects (ID: 5:30).

Company C employs a combination of formal learning groups and specialised committees for internal communication (ID: 8:43). However, information often does not disseminate widely throughout the organisation, with communication typically stopping at certain hierarchical levels (ID: 8:52). External communication is managed through formal networks with less emphasis on innovative or informal external interactions (ID: 8:44). Innovation in this sector is often constrained by limited resources and time, leading to a slower pace of adoption and a focus on improving existing processes rather than pursuing radical innovation (ID: 8:54).

Lastly, the agriculture sector is notable for its strong culture of collaboration and extensive use of both internal and external communication channels. This industry is highly networked, with farmers regularly exchanging ideas and innovations through a variety of forums, digital platforms, and social media (ID: 10:18, 10:21). The innovation process in agriculture is

community-driven, with a focus on practical applications that can be quickly tested and implemented (ID: 10:17). This sector's approach to communication and innovation is more grassroots and adaptable, enabling swift responses to emerging challenges and opportunities (ID: 10:26).

In summary, the analysis highlights significant differences in how companies in various industries approach communication and innovation. Company A and Company C lean towards structured, formal communication and a slower, more deliberate innovation process. In contrast, Company D and the agriculture sector prioritise flexibility, openness, and rapid adaptation, reflecting their need to stay competitive in fast-changing environments. Company B and Company E occupy a middle ground, balancing structured communication with practical, continuous improvement efforts. Each company's approach is tailored to its specific operational demands, illustrating the importance of aligning communication and innovation practices with the unique challenges and goals of the sector.

Tools and Methods for the Governance of Innovation

In the context of the interviews conducted, the discussion surrounding "Tools and Methods for the Governance of Innovation" was primarily addressed by Interviewee 10. This respondent provided valuable insights into various facets of innovation management within their organisation, focusing particularly on the promotion of entrepreneurship, the execution of venture-building projects, and the challenges inherent in fostering a corporate culture that supports innovative thinking (ID: 7:4).

Interviewee 10 described their role in launching programs aimed at nurturing entrepreneurship. These programs are designed to develop and collect employees' ideas, providing them with the necessary tools, such as the business model canvas and value

proposition canvas, to transform these ideas into viable business models. This approach underscores the importance of structured methods in driving innovation, ensuring that employees are not only encouraged to innovate but also equipped with the right frameworks to bring their ideas to fruition (ID: 7:4).

Venture-building projects were highlighted as particularly complex yet essential components of innovation governance. Interviewee 10 explained that these projects involve identifying gaps and opportunities from corporate strategic plans and IT sources, such as patents, and developing entrepreneurial ideas that can be brought to market. This process reflects a deep integration of innovation governance methods, where the focus extends beyond mere idea generation to include the practicalities of market entry and business development (ID: 7:4).

One of the significant challenges identified by Interviewee 10 was the difficulty in shifting the corporate mindset towards a more startup-like, innovative approach. This challenge, particularly prevalent among employees, managers, and directors, illustrates the critical role of leadership and cultural change in the effective governance of innovation. The need to foster a culture that embraces experimentation and new ways of thinking is essential for sustaining innovation, especially in larger, more established corporations (ID: 7:5).

Interestingly, other interviewees did not address the topic of innovation governance tools and methods. This could be attributed to the specific focus of their roles, which may be more operational or technical, thus limiting their engagement with broader strategic aspects of innovation. Moreover, the level of involvement in innovation governance might vary depending on the interviewee's position within the company, with senior leaders or those in dedicated innovation roles more likely to engage with these tools and methods.

The insights provided by Interviewee 10 emphasise the importance of a multifaceted approach to innovation governance, where structured tools and methods play a crucial role in

managing and guiding innovation efforts. The challenges of shifting corporate mindsets and fostering a culture of innovation reflect the broader difficulties faced by many organisations in embedding innovation into their core operations. The absence of discussion on these topics by other interviewees suggests that tools and methods for the governance of innovation is a specialised area, primarily relevant to those directly responsible for driving strategic innovation within the organisation.

Roles of innovation

In examining the roles of innovation across various companies, it becomes clear that the structure and focus of these roles are deeply influenced by the specific needs and challenges of each sector. In Company A, innovation is managed through highly specialised departments dedicated to improvement management, market forecasting, and innovation processes. These roles are centralised and systematically integrated into the company's broader strategy, reflecting the complexity and scale of the industry (IDs 1:14, 1:51, 1:52, 1:56). The structured approach ensures that innovation efforts are aligned with the company's long-term survival and economic goals. However, the sheer volume of products and the complexity of operations present ongoing challenges in effectively managing and implementing innovations without duplication of efforts (IDs 1:54, 1:55).

In contrast, Company B demonstrates a more decentralised approach to innovation. While there is an openness to innovation across the company, with employees encouraged to contribute ideas, the roles related to innovation are less formalised and often confined to specific departments such as digitalisation (IDs 3:54, 3:55, 3:56). This lack of clear structure can lead to challenges in managing innovation effectively, as responsibilities and priorities may be unclear, potentially hindering the overall impact of innovation efforts (IDs 3:57, 3:58). Notably,

Interviewee 4 expressed uncertainty about specific tasks or roles related to innovation, indicating possible gaps in communication or role clarity within the organisation (IDs 3:54, 3:55, 3:57, 3:58). This sentiment is further supported by insights from Interviewee 5, who highlighted the challenges of replacing long-established processes with innovative solutions and generating ideas that are both creative and practical within the existing organisational framework (IDs 6:6, 6:7).

Company D, on the other hand, showcases a more formalised approach with specific roles such as Open Innovation Facilitators, who are responsible for managing external collaborations and integrating these into the company's innovation processes (IDs 4:51, 4:52). This highlights the sector's focus on leveraging external networks to drive innovation. In Company E, there is a strong emphasis on digitalisation, with significant investments in personnel and tools aimed at enhancing process efficiency through innovations like automated documentation and digital construction management (IDs 5:28, 5:29, 5:30).

In Company G, represented by the insights of Interviewee 10, there is a comprehensive and strategic approach to innovation governance. This includes fostering entrepreneurship through programmes that develop employees' ideas, executing complex venture-building projects, and creating ecosystems that support innovation (IDs 7:21, 7:22, 7:26). The role of the Chief Innovation Officer (CINO) is highlighted as critical in aligning innovation with corporate strategy, ensuring that innovation efforts are not only strategically aligned but also resourced and supported across the organisation (IDs 7:23, 7:26). The primary challenge is the need to shift corporate mindsets towards a more startup-like, innovative approach, particularly within large, established corporations (ID 7:26).

Interviewee 6 working in Company C, meanwhile, presents a different landscape where innovation roles are more dispersed across various departments. These roles are often focused on making cities more attractive and future-proof through sustainable initiatives such as

electromobility and photovoltaic systems (IDs 8:19, 8:21, 8:46, 8:47). The decentralised nature of innovation in this company reflects the public sector's unique priorities, where the impact on society and sustainability takes precedence. However, this also presents challenges in balancing innovation with the often slow-moving bureaucratic processes, ensuring that resources are used efficiently while still meeting public expectations (IDs 8:48, 8:50).

A key insight from this comparative analysis is the contrast between centralised and decentralised approaches to innovation. In companies like A and D, innovation roles are centralised within specialised departments, allowing for a more structured and strategic approach (IDs 1:14, 1:51, 4:51). Conversely, in companies like B and C, innovation roles tend to be more decentralised, which can lead to challenges in coordination and effectiveness (IDs 3:54, 3:55, 8:19, 8:21).

Across all sectors, the role of leadership emerges as a critical factor in driving innovation. Whether through the strategic alignment provided by a CINO or the support from top management in municipal settings, effective leadership is essential in integrating innovation into the broader organisational strategy (IDs 7:21, 8:46). Furthermore, sector-specific focuses reveal that industries like automotive manufacturing and construction prioritise process efficiency and technological advancement, while construction and engineering and agnostic sectors emphasise external collaboration and strategic alignment. Municipal administration, with its public sector focus, highlights societal impact as a key driver of innovation.

Despite the differences in structure and focus, common challenges emerge across sectors. These include the need for alignment between innovation efforts and organisational strategy, the integration of new tools and processes, and the management of innovation across different levels and departments. The complexity of these challenges varies depending on the maturity

of innovation within each sector, but they underline the importance of a well-coordinated approach to innovation governance.

In conclusion, the roles of innovation across different companies in various sectors are shaped by the specific demands and challenges of each sector. While the approaches may differ - ranging from highly centralised and structured to more decentralised and open - the underlying principles of aligning innovation with strategic goals, fostering effective leadership, and managing the integration of innovation processes remain critical for success. As organisations continue to navigate the complexities of innovation, these insights provide valuable guidance on how to structure and manage innovation roles to maximise impact and drive long-term success.

The following mind map visually summarises the key innovation governance practices discussed in this section, focusing on the internal and external communication strategies, incentives, and roles of innovation across various industries.

Figure 3: Company-Specific Innovation Practices in Innovation Governance

4.2.3. Metrics

Key Performance Indicators (KPIs) are vital tools for measuring the success and impact of innovation within an organisation. This section investigates how different companies prioritise and implement KPIs to track their innovation activities, focusing on how employee roles, responsibilities, and experiences influence the selection and emphasis of these metrics. By comparing the use of KPIs across sectors like automotive manufacturing, logistics, and construction, the analysis uncovers the diverse approaches to evaluating innovation performance. This section also highlights the importance of aligning KPI frameworks with sector-specific challenges and goals, ensuring that the metrics used effectively support strategic decision-making and long-term growth.

In analysing the influence of employee roles, responsibilities, and experiences on the types of Key Performance Indicators (KPIs) emphasised across various sectors, it becomes evident that the specific context in which these KPIs are applied plays a significant role in shaping their focus and implementation.

In Company A, employees involved in research and development (R&D), such as Interviewees 1, 2 and 3, demonstrate a strong emphasis on KPIs related to product refinement, efficiency, and cost reduction. For example, Interviewees 1, 2, and 3 with substantial experience (IDs 1:6, 2:7) are deeply involved in the technical aspects of the company. This involvement naturally aligns their focus towards metrics that assess cost efficiency, the progress of product testing phases, and overall operational improvements (ID 1:41, 2:30). Additionally, the broader economic context within the automotive industry, which necessitates staying viable amidst stringent regulatory demands, further underscores the importance of economic KPIs. For instance, Interviewee 3 involved in development highlighted the critical balance between ecological concerns and economic imperatives (ID 9:7), demonstrating the company's intricate KPI landscape that intertwines technical efficiency with broader economic goals (ID 9:6).

In Company B, the focus on KPIs is closely tied to operational efficiency and personnel management. Roles such as those held by Interviewee 4 (IDs 3:3, 3:4) involve the management of daily operations and the oversight of key figures related to staff performance. This operational focus is reflected in the types of KPIs prioritised, which often measure system errors, project success rates, and employee productivity (ID 3:6). Furthermore, the sector's growing emphasis on digital transformation, illustrated by the introduction of a company-wide digitisation index (ID 6:22), shows a shift towards integrating digital tools and processes to enhance operational efficiency and communication.

Company D places a significant emphasis on KPIs that measure the success of innovation initiatives, particularly those involving cross-functional collaboration and client satisfaction. Professionals, such as Interviewee 7 working as a project manager (ID 4:3), prioritise KPIs that track project deadlines and the financial impact of innovative solutions (IDs 4:6, 4:19). Their leadership roles in managing multidisciplinary teams and overseeing complex projects drive them to focus on KPIs that align with these responsibilities, ensuring that innovation efforts are both timely and strategically impactful. Moreover, the strategic use of KPIs in Company D, to prioritise resources and track the outcomes of innovation, highlights the company's commitment to ensuring that developed solutions are not only innovative but also financially viable and aligned with the company's long-term goals (IDs 4:40, 4:41).

In Company E, KPIs are often related to sales performance, process efficiency, and managing economic fluctuations. Senior employees in sales (ID 5:3) focus on securing orders and developing processes, with KPIs closely tied to market responsiveness and operational success (IDs 5:6, 5:7). Leadership roles in construction are particularly concerned with adapting to market changes, which is reflected in the KPIs that are prioritised. These KPIs often relate to managing economic cycles and competitive positioning, underscoring the industry's need to stay agile and responsive to external market forces (ID 5:8).

The analysis also reveals that the background and experience of employees significantly shape the types of KPIs they prioritise. In Company A, Interviewees 1 and 2 with extensive experience (IDs 1:6, 2:7) and those in leadership positions like Interviewee 1 (ID 1:5) are more inclined to focus on KPIs that drive long-term efficiency and cost management. Their deep involvement in technical and operational aspects naturally aligns their focus on refining processes, reducing costs, and ensuring the viability of innovations within the competitive automotive industry.

In contrast, younger employees in Company B, such as Interviewee 4 (IDs 3:2, 3:3), who occupy technical roles, tend to prioritise KPIs that ensure the smooth functioning of systems and daily operations. The emphasis on immediate operational metrics reflects the tactical and process-oriented nature of their responsibilities. Additionally, the logistics sector's increasing focus on digital transformation, as evidenced by the mention of a company-wide digitisation index (ID 6:22), illustrates the sector's efforts to measure and improve the integration of digital tools across various operations.

In Company D, the focus on innovation KPIs by those in leadership and project management roles (IDs 4:3, 4:8) is driven by the need to ensure that innovative solutions are delivered on time and contribute meaningfully to the company's strategic objectives. Interviewee 7's experience in managing complex, multidisciplinary projects (ID 4:9) reinforces the importance of KPIs that track both financial performance and innovation outcomes.

This analysis demonstrates that the roles, responsibilities, and experiences of employees play a critical role in shaping the types of KPIs they prioritise. In companies like Company A, where product refinement and cost efficiency are paramount, employees involved in R&D and development naturally emphasise KPIs that reflect these priorities. Conversely, in companies

like B and D, where operational efficiency and innovation are key drivers, KPIs are focused more on process management, project success, and the financial impact of innovation.

The alignment between employee roles and KPI focus underscores the importance of tailoring KPI frameworks to the specific needs and contexts of different sectors and roles within an organisation. By understanding the underlying drivers of these KPIs, organisations can better support their employees in achieving strategic objectives and ensuring that innovation efforts are both impactful and aligned with broader business goals.

The following table summarises the key findings from the analysis, providing a clear overview of how the sector, roles, responsibilities, and employee experience shape the focus and implementation of KPIs across different industries.

Table 7: Key Findings from the Analysis of Metrics

Sector	Main KPI Focus Areas	Influential Roles & Responsibilities	Impact of Employee Experience
Automotive Manufacturing	- Product refinement - Efficiency - Cost reduction	- R&D roles: Constructors, Development Specialist - Leadership roles	- Experienced employees who focus on long-term efficiency and cost management. - Technical expertise aligns with refining processes.
Logistics	- Operational efficiency - Personnel management - Digitalisation	- HR System Specialist - Digital HR Transformation Expert - Daily business operations - Digitalisation roles	- Younger employees who focus on immediate operational KPIs. - Digital transformation KPIs reflect sector's adaptation to technology.
Construction and Engineering	- Innovation success - Cross-functional collaboration - Client satisfaction	- Project Manager - Multidisciplinary team leader - Strategic roles	- Leadership roles drive focus on innovation and financial KPIs. - Experience in managing complex projects influences KPI prioritisation.
Construction industry	- Sales performance - Process efficiency - Market adaptation	- Senior Sales Employees - Leadership roles in adapting to market changes	- Emphasis on KPIs related to securing orders and operational success. - Leadership focus on economic cycles and competitive positioning.

4.3. Summary of Findings

The analysis of interview data across different companies operating in various industries reveals distinct approaches to innovation management, highlighting how industry-specific contexts shape practices in Idea Management, Innovation Governance, and the use of Metrics.

Idea Management practices differ significantly across companies, reflecting the unique operational demands and strategic priorities of each industry. In regulated industries like automotive and municipal administration, idea generation is often driven by the need to comply with external regulations, leading to a systematic and structured approach. In contrast, sectors such as construction and engineering and logistics prioritise flexibility and immediate applicability, fostering creativity through regular brainstorming sessions and collaborative environments. The use of Idea Mapping and Evaluation tools also varies, with digital tools playing a crucial role in construction and engineering, where these processes are highly structured and data-driven. In industries like logistics and construction, more traditional and collaborative approaches are favoured, emphasising practicality and alignment with operational goals. When it comes to Idea Selection and Rejection, the process is formalised in sectors like automotive and construction, where ideas undergo rigorous scrutiny. Meanwhile, in dynamic industries like construction and engineering, the process is more iterative, allowing for continuous refinement. The approach to idea rejection varies as well; some sectors use it as a learning opportunity, while others focus on strategic alignment and long-term goals.

Experimentation and Execution practices also vary widely. The automotive and construction sectors emphasise structured processes and thorough validation before large-scale implementation, reflecting their focus on technical and operational reliability. In contrast, the construction and engineering sector prioritises rapid iteration and client involvement, adopting a “fail fast, learn fast” mentality to drive continuous improvement. The logistics sector blends

controlled experimentation with operational flexibility, while municipal administration balances bureaucratic oversight with the need for practical experimentation.

Project Review processes show further variation, reflecting the distinct operational challenges and strategic priorities of each industry. In the construction and engineering sector, reviews focus on learning from failures through structured "Failure Feedback" sessions, aligning with agile methodologies. The construction industry employs comprehensive reviews involving a broad range of stakeholders, ensuring that lessons learned are thoroughly documented and applied. The automotive sector integrates lessons learned into broader innovation strategies, emphasising systematic documentation and process improvement to enhance future project outcomes.

Innovation Governance practices are equally diverse across industries. Structured financial incentives are prevalent in sectors like automotive and logistics, where rewards are tied to specific, practical outcomes, such as patents or successful project implementations. The construction and engineering sector combines financial rewards with opportunities for career advancement, fostering a culture of continuous improvement and rapid iteration. In contrast, the agnostic sector adopts a more flexible approach, offering personalised incentives that align with individual career growth and aspirations, particularly effective in dynamic and diverse environments.

Internal and External Communication practices range from highly structured and formalised in sectors like automotive and municipal administration to more open and flexible in the construction and engineering and agriculture sectors. The effectiveness of these practices in fostering innovation depends on how well they align with the industry's operational context. For instance, formal internal communication is essential in sectors where precision and reliability are critical, while sectors that prioritise rapid innovation benefit from more fluid communication channels, both internally and externally.

The Roles of Innovation are centralised in industries like automotive and construction and engineering, where innovation needs to be strategically aligned with broader business goals. In contrast, sectors like logistics and municipal administration exhibit a more decentralised approach, which can sometimes lead to challenges in coordination and effectiveness. Across all industries, leadership plays a critical role in integrating innovation into the overall organisational strategy, ensuring that innovation efforts are aligned with long-term objectives and adequately resourced.

The use of Tools and Methods for the Governance of Innovation is crucial for effective innovation management. In Company G, tools like the Business Model Canvas and Value Proposition Design are commonly used to align innovation efforts with strategic goals. These tools help in systematically managing the innovation process from idea generation to market implementation. However, challenges remain in shifting corporate mindsets towards more innovative approaches, particularly in larger organisations where traditional processes may be deeply entrenched.

Metrics used to measure and manage innovation activities highlight both commonalities and differences across industries. In sectors like automotive manufacturing, KPIs focus heavily on product refinement, efficiency, and cost reduction, driven by roles in R&D and development. In contrast, the construction and engineering sector prioritises innovation success, cross-functional collaboration, and client satisfaction, reflecting the sector's dynamic and project-based nature.

The types of KPIs emphasised are strongly influenced by the roles, responsibilities, and experience of employees. For example, experienced employees in the automotive sector prioritise long-term efficiency and cost management, while younger employees in logistics focus on operational efficiency and digital transformation. This alignment between roles and

KPI focus underscores the need for tailored KPI frameworks that reflect the specific needs and challenges of each sector.

5. Discussion of Findings

This section aims to compare the results of the data analysis with findings from the literature review, focusing on innovation management practices across various industries. The objective is to identify similarities and differences between theoretical frameworks and actual practices observed in real-world settings. By examining whether the practices advocated in the literature are truly implemented in different industries, this discussion seeks to reveal both the alignment and the discrepancies between theory and practice. Additionally, this analysis will explore whether these differences vary across industries, providing insights into how innovation management is tailored to specific sectoral needs and challenges.

5.1. Idea Management

Idea management is a critical component of innovation, encompassing the processes of generating, organising, evaluating, selecting, and rejecting ideas, experimentation, execution and adaptation of ideas as well as completing a project review within an organisation. This section delves into how different industries handle these stages, comparing the theoretical approaches advocated in the literature with the practical methods observed in various sectors. By examining these processes, patterns that inform effective idea management strategies tailored to specific industry needs can be identified.

5.1.1. Idea Generation, Mapping, Evaluation, Selection, Rejection

The innovation process, encompassing stages such as idea generation, mapping, selection, evaluation, and rejection, is fundamental to organisational growth and adaptation. The way these processes are handled varies significantly across industries, shaped by external pressures, industry-specific needs, and internal cultures. A comparative analysis of these processes in the

automotive, logistics, construction, and other sectors reveals patterns that both align with and diverge from existing literature.

Idea Generation

Idea generation is widely recognised as a creativity-intensive and often unstructured process, crucial for the development of novel ideas that can drive innovation forward (Christiansen & Gasparin, 2016; Perry-Smith & Mannucci, 2017). The literature suggests that this stage involves a high degree of uncertainty, requiring tools and methodologies that can stimulate creative thinking even under ambiguous conditions (Zhou et al., 2021). Traditional methods such as empathetic design and qualitative interviews, as well as modern digital tools like corporate online ideation platforms, are frequently employed to foster idea generation (Leonard & Rayport, 1997; Kruft et al., 2019).

However, the empirical findings from this study indicate that the approach to idea generation varies significantly across industries, often influenced by external regulatory pressures or the specific operational needs of the sector. In Company A as well as Company C, idea generation is heavily shaped by the need to comply with stringent regulations. This external focus aligns with the literature's acknowledgment of uncertainty but places a stronger emphasis on compliance and foresight rather than purely creative exploration. In contrast, Company D aligns closely with the literature's emphasis on creativity, fostering idea generation through environments that encourage collaboration and the use of digital tools to facilitate the flow of new ideas. Company E presents a more structured approach, where idea generation is directly tied to project needs, reflecting a pragmatic and immediate application of innovative thinking. This suggests that while the literature broadly supports unstructured creativity, industries like automotive and construction demonstrate that a structured, compliance-driven approach is also crucial in certain contexts.

Idea Mapping

Idea mapping, which involves structuring and organising ideas using both digital and physical tools, is another critical stage in the innovation process. The literature highlights the advantages of digital tools like MURAL for virtual brainstorming, which can eliminate production blocking and provide a persistent space for continuous idea improvement (Nijstad et al., 2003; Tsipursky, 2022). Analytical tools such as SWOT and PESTLE analysis are also emphasised for their role in evaluating the potential impact of ideas (Bouhali et al., 2015).

In practice, the empirical data reveals a clear distinction between industries in their approach to idea mapping. Company D fully embraces the digital tools advocated in the literature, using platforms like Miro to categorise and assess ideas with precision. This approach not only supports the literature's emphasis on digital tools but also underscores the importance of scalability in rapidly evolving industries. Conversely, Company B favours more manual methods, such as using whiteboards during brainstorming sessions which contrasts with the literature's focus on digital solutions, highlighting that traditional, physical tools remain valuable in certain contexts.

Idea Evaluation

The literature emphasises the importance of idea evaluation in the innovation process, highlighting its role in assessing the quality, risks, and feasibility of ideas before advancing them further (Girotra & Netessine, 2020). This aligns well with the empirical findings across various industries, though each sector tailors its evaluation process to fit its unique operational demands.

In Company A, the evaluation process is marked by a highly structured approach, where technical feasibility, financial metrics, and alignment with existing systems take precedence. This rigorous method, supported by continuous feedback loops and strict criteria, mirrors the

literature's emphasis on thorough assessment and managerial oversight, ensuring that only the most viable ideas progress. This structured approach in the automotive sector echoes the literature's assertion that idea evaluation often involves specific individuals, such as executives or R&D heads, who play a critical role in the selection process (Poetz & Schreier, 2012).

In contrast, Company D adopts a more iterative and dynamic approach to idea evaluation. Structured sessions like "Future Fridays" and "Pitch Days", which involve both executives and potential clients, allow for continuous refinement and agility – key elements in a rapidly evolving technological landscape. While the literature acknowledges the importance of group settings for evaluation (Rietzschel et al., 2019), the construction and engineering sector's emphasis on flexibility and rapid adaptation extends the literature's principles, showcasing how industries that face technological shifts must remain nimble in their evaluation processes. Similarly, Company B integrates evaluation into regular team meetings, where ideas are assessed and prioritised based on practical considerations. This company's focus on cross-functional collaboration ensures that ideas are not only feasible but also aligned with operational constraints, reflecting the literature's guidance on using criteria like cost, time, and impact in the evaluation matrix (Bureau, 2020). The logistics sector's approach reinforces the literature's view that practical feasibility and alignment with broader organisational goals are crucial components of the evaluation process. Company E also reflects the literature's emphasis on structured evaluation, employing both digital tools and formal committees to ensure a thorough and methodical assessment. This industry's use of systematic processes and formal committees aligns closely with the literature's best practices, where structured evaluation is essential for aligning ideas with strategic objectives and ensuring accountability throughout the innovation process.

Idea Selection

The selection of ideas, where the most promising concepts are chosen for further development, is another stage where practice often diverges from theory. The literature generally supports a formal and structured approach to idea selection, often involving ranking and prioritisation techniques to ensure that only the most viable ideas are pursued (Sakamoto & Bao, 2011; Garbuio & Lin, 2019).

Empirically, Company A, Company B as well as Company E align closely with the literature, exhibiting highly formal and structured selection processes. These industries rely on multi-layered review stages to ensure that selected ideas align with long-term strategic goals and regulatory requirements. However, in Company C as well as in Company B, there is a specific decision-maker responsible for deciding which ideas to further pursue. In contrast, Company D demonstrates more flexibility in its selection process. This iterative approach reflects the fast-paced and dynamic nature of the engineering industry, where the ability to adapt and refine ideas continuously is critical for maintaining competitive advantage.

Idea Rejection

The rejection of ideas is a crucial stage in the innovation process, ensuring that only the most viable and strategically aligned concepts move forward. According to the literature, common reasons for rejecting ideas include resource constraints (Caniëls & Rietzschel, 2015), strategic misalignment, high risk (McNally et al., 2010), and technological challenges. Decision-making in this phase often involves multiple stakeholders, such as executives and innovation teams, who use specific criteria to assess whether an idea fits the organisation's goals and capabilities (Amabile & Mukti, 2008; McNally et al., 2011). Effective communication of rejections is essential to maintain employee motivation and creativity, with research suggesting that constructive feedback can mitigate negative impacts (Baer, 2012). Additionally, documenting

and periodically revisiting rejected ideas can lead to new opportunities, as some concepts may become viable later due to changing circumstances or technological advancements (Mascareño et al., 2021).

Empirical data from different companies operating in various industries shows that while these theoretical principles are generally upheld, the approach to idea rejection differs by sector. In Company A representing the automotive manufacturing sector, rejections often stem from technical feasibility issues and strategic misalignment, reflecting the industry's focus on long-term goals. Company D representing the construction and engineering sector, however, treats rejections as learning opportunities, using “Failure Feedback” sessions to extract valuable lessons for future projects. Company E representing the construction industry combines structured evaluation with a cultural encouragement to experiment and learn from failures, viewing setbacks as steps toward eventual success. In Company C representing the municipal administration sector, rejections are primarily driven by regulatory and practical constraints, ensuring that ideas align with these operational realities. Meanwhile, both Company B representing the logistics industry and Company E representing the construction sector illustrate how rejected ideas can be revisited and revised as part of continuous improvement efforts.

In summary, while the literature provides a general framework for idea rejection, industries adapt these guidelines to suit their specific operational contexts, balancing strategic alignment with flexibility and continuous learning.

5.1.2. Experimentation, Execution, Adaptation

The phases of experimentation, execution, and adaptation are pivotal in the innovation process, where ideas transition from concepts to practical applications. Both the literature and empirical data recognise the critical nature of these stages, though the approach varies significantly across industries, reflecting their distinct operational contexts and strategic imperatives.

The literature on experimentation and adaptation emphasises agility, which is defined as the capability to rapidly adjust to environmental changes. Agility encompasses flexibility, speed, and resilience, enabling organisations to respond effectively to market dynamics (Salo, 2017; Rigby et al., 2018). Various frameworks, such as Scrum, Kanban, and Lean, are proposed to facilitate this agility, with a focus on iterative processes that incorporate continuous feedback and adjustment (Schwaber & Sutherland, 2017; Anderson, 2010; Womack & Jones, 2003).

Empirical data from Company A aligns closely with the literature's emphasis on structured processes. This industry employs a meticulous approach to experimentation and execution, moving from prototypes to full-scale production only after thorough validation of all technical aspects. Pilot projects, often exploring new frameworks like agile methodologies, are used to ensure robustness and feasibility. This structured, step-by-step approach mirrors the literature's focus on minimising risks through rigorous testing.

In contrast, Company D exemplifies the literature's ideal of agility more directly. This company prioritises flexibility and rapid iteration, embodying a "fail fast, learn fast" ethos. Agile methodologies, such as rapid Proof of Concepts (PoCs) and pilot projects, are employed to test ideas in real-world conditions, allowing for quick adaptation based on feedback. The company's use of continuous feedback and client engagement, particularly through "Beta

Client" agreements, strongly supports the literature's argument that agility is crucial for maintaining competitiveness in fast-paced environments.

Company B presents a more pragmatic approach, blending elements of both structured and agile methodologies. Experimentation is conducted within controlled environments that prevent disruption to core operations, a practice that aligns with the literature's advocacy for flexibility tempered by operational stability. Company B's reliance on feedback and its iterative nature – where adaptations are frequently made as new data emerges – resonates with the literature's emphasis on continuous improvement.

In Company E, the approach to experimentation and adaptation is supported by specialised digital tools and internal support structures, which facilitate the development and testing of new ideas. However, the long timelines typical of construction projects often necessitate continuous adjustments, a reality that aligns with the literature's discussion of the challenges of maintaining agility in complex, long-term projects. The construction sector's approach highlights the necessity of balancing rigorous planning with the flexibility to adapt to evolving project requirements.

Company C demonstrates a blend of structure and adaptability. Experimentation often requires approval from higher management, particularly when the potential impact is significant, reflecting a more bureaucratic approach compared to the agile frameworks discussed in the literature. However, within smaller teams, there is a degree of flexibility to experiment autonomously, provided the initiatives align with broader organisational goals. The need for legal and regulatory compliance during the execution phase further distinguishes this sector's approach from the more agile and flexible models advocated in the literature.

Finally, the agricultural sector adopts a highly collaborative and community-driven approach to experimentation and adaptation. Innovations are often tested independently by farmers or in

collaboration with machinery manufacturers, with rapid feedback loops facilitating swift adaptation. This sector's emphasis on practical, immediate results contrasts with the more structured approaches of other industries and underscores the importance of tailoring innovation processes to specific sector needs. The agricultural sector's approach reflects the literature's recognition of the value of rapid prototyping and adaptation but highlights the distinct ways in which different sectors operationalise these principles.

In summary, while the literature provides a broad framework for understanding the importance of agility and iterative processes in experimentation, execution, and adaptation, the empirical data reveals significant variations in how these principles are applied across different industries. The automotive and construction industries align more closely with the literature's emphasis on structured, risk-averse processes, while the construction and engineering and agricultural sectors embody the agility and rapid iteration that the literature champions. The logistics sector, meanwhile, represents a hybrid approach, balancing structured experimentation with the need for operational flexibility. Municipal administration, with its emphasis on compliance and hierarchical decision-making, presents a unique case that highlights the challenges of implementing agile methodologies in more regulated environments. These variations underscore the importance of contextualising the literature's insights within the specific operational realities of each industry.

5.1.3. Project Review

The literature consistently emphasises the importance of project reviews as a tool for learning from both successes and failures. Project reviews are seen as critical for understanding where projects went right or wrong, enabling organisations to refine their processes and improve future outcomes (Szatmari et al., 2021; Marwa & Zairi, 2008). The data analysis aligns well with this view, as seen in the practices of the construction and engineering, construction, and automotive industries, where systematic reviews are conducted to capture lessons learned.

Company D's approach to project reviews, characterised by "Failure Feedback" sessions, is highly reflective of the literature on agile methodologies. These sessions focus on quickly identifying and correcting mistakes to enable rapid adaptation and continuous improvement, which is consistent with the agile principle of iterative learning (Shepherd & Cardon, 2009). The literature supports this approach, noting that in uncertain environments like engineering, quick feedback loops and adaptive learning are essential for maintaining competitive advantage (García-Quevedo et al., 2018). This aligns with the data, where Company D uses these sessions to frame failures as opportunities for growth.

In contrast, the construction industry's approach is more comprehensive and structured, involving large-scale reviews with extensive documentation. The literature suggests that such thorough reviews are crucial in industries where projects are complex, large-scale, and involve multiple stakeholders (Nägele, 2019). The data analysis confirms this, showing that construction companies engage in detailed evaluations of project outcomes, covering various aspects from financial performance to safety and team dynamics. This approach ensures that all potential learning opportunities are captured, which is essential for continuous improvement in such a high-stakes environment.

Company A's practice of integrating lessons learned into both project reviews and broader innovation management reflects a strategic approach to organisational learning. The literature

highlights the importance of systematic learning in reducing the risks associated with innovation projects (Greve, 2003). The data shows that Company A focuses on documenting and analysing failures to avoid repeating mistakes, which is consistent with the concept of Learning from Experience Deficiency (LDEF) discussed in the literature. This ensures that foundational issues are addressed early, thereby improving the likelihood of success in future projects.

The literature underscores the significance of organisational culture in the effectiveness of project reviews. A blame culture can hinder open discussions and learning, while a culture of psychological safety encourages transparency and constructive feedback (Carmeli et al., 2012). The practices observed in the construction and engineering and automotive sectors, where failures are discussed openly and used as learning opportunities, suggest a culture that supports psychological safety. This cultural aspect is crucial for fostering an environment where project reviews can lead to meaningful improvements.

The data analysis from the construction and engineering, construction, and automotive industries aligns well with the key themes identified in the literature. Company D's focus on rapid feedback and iteration is well-suited to its uncertain environment, as supported by the literature. Company E's comprehensive and structured reviews are consistent with the need for thorough evaluation in complex projects. Meanwhile, Company A's systematic integration of lessons learned underscores the importance of strategic learning, as highlighted in the literature. Across all sectors, the role of organisational culture and the use of modern tools are critical factors that influence the effectiveness of project reviews. These findings reinforce the idea that while the core purpose of project reviews is consistent – learning from past experiences – the methods and emphasis vary significantly depending on the operational context and strategic priorities of each industry.

5.2. Innovation Governance

Effective innovation governance is crucial for aligning innovation activities with an organisation's strategic goals. This section compares and analyses the incentives, tools and methods, communication, and leadership roles that support innovation governance, drawing on both theoretical frameworks and empirical data.

5.2.1. Incentives

In today's rapidly evolving business environment, incentivising innovation is vital for organisations aiming to maintain a competitive edge. Both the literature and practical observations across various industries highlight the importance of carefully designed incentive systems to foster creativity and drive innovation. However, the specific approaches and structures of these incentives vary significantly across different sectors, reflecting each industry's unique operational demands and strategic priorities.

Company A exemplifies a highly structured approach to incentives, focusing predominantly on financial rewards such as bonuses, innovation competitions, and awards. These incentives are closely tied to specific achievements, such as securing patents or successfully integrating new ideas into production processes. This method aligns well with the industry's emphasis on precision, reliability, and continuous improvement, ensuring that innovations are thoroughly vetted and practically applicable before they are rewarded. The structured nature of these incentives helps maintain a focus on operational efficiency and long-term sustainability, as highlighted in the literature (Manso, 2017). However, the heavy reliance on financial incentives may pose challenges in balancing short-term rewards with the need for sustained innovation, a concern also noted in academic discussions (Aschenbrücker & Kretschmer, 2022).

Similarly, Company B employs structured financial incentives, with a strong focus on recognising and rewarding the practical implementation of ideas. This company uses awards, financial bonuses, and public recognition through internal platforms to encourage innovation. The company's approach is closely aligned with its industry's operational focus on efficiency and productivity, where practical, implementable innovations are highly valued. This structured incentive system, as observed in the data, supports the company's goal of fostering a culture of continuous improvement. However, the literature suggests that while financial incentives are effective, they should be complemented by non-financial rewards to avoid potential pitfalls like short-termism and inequity among employees.

In contrast, Company D adopts a more comprehensive and integrated approach to incentives. Alongside financial rewards, such as the prestigious "Innovator of the Year" award, the sector offers significant opportunities for career advancement, thereby promoting a culture of continuous learning and rapid iteration. This approach is closely tied to the sector's agile methodologies, which emphasise iterative development and adaptation. The integration of both financial and non-financial incentives aligns well with the literature's recommendation for a balanced incentive system that motivates sustained innovation while fostering a collaborative and dynamic work environment (Manso, 2011). By linking incentives to both individual and team achievements, the company effectively cultivates an environment where innovation is a key focus, supporting the literature's emphasis on the need for holistic incentive structures.

Company E also leverages financial incentives, primarily focusing on rewards tied to specific project milestones. This approach reflects the industry's need for thorough planning and risk management, ensuring that innovation is aligned with the successful completion of key deliverables. Additionally, the company places significant importance on the documentation and sharing of successful innovations through internal platforms, which helps embed lessons learned into future projects. While this approach is effective in ensuring that innovations are

practically implemented, the literature suggests that incorporating more non-financial incentives could further enhance employee engagement and long-term commitment to innovation (Babu, 2018).

Finally, Company G represents a flexible and personalised approach to incentivising innovation. This company aligns incentives closely with the innovative projects of employees, offering not only monetary rewards but also opportunities for personal and professional growth, such as leading new divisions or gaining equity in new ventures. This personalised approach recognises the diverse motivations of employees and caters to individual preferences and career aspirations. By integrating incentives with employee development and training, the company fosters a culture where innovation is closely linked to personal growth, effectively encouraging employees to take ownership of their ideas and drive them forward. This approach resonates strongly with the literature's emphasis on the importance of non-financial incentives, such as career advancement and professional development, in sustaining long-term innovation efforts (Manso, 2011).

Incentivising innovation is a complex yet critical component of organisational strategy, and the methods employed vary significantly across industries. The automotive and logistics sectors favour structured, financial incentives that reward practical, implementable ideas, aligning with their operational needs. The construction and engineering sector combines financial rewards with opportunities for career advancement, fostering a culture of rapid iteration and continuous improvement. The construction industry ties incentives to project milestones, with a strong emphasis on documentation and risk management. In contrast, the agnostic sector offers a flexible, personalised approach, aligning rewards with individual career growth and development. This diversity in incentive strategies underscores the importance of tailoring

incentive systems to the specific demands and characteristics of each industry, ensuring that they effectively motivate employees to contribute to the organisation's innovative efforts.

5.2.2. Internal and External Communication

In today's complex and interconnected business landscape, the effectiveness of an organisation's communication strategy can significantly impact its capacity to innovate, adapt, and thrive. Internal communication ensures that knowledge flows seamlessly across departments, fostering a culture of collaboration, transparency, and shared vision. Meanwhile, external communication extends these dialogues beyond the organisation, engaging key stakeholders, gathering valuable insights, and forging partnerships that are crucial for sustaining innovation.

The importance of internal communication in driving innovation is well-documented, with the literature and data both underscoring its critical role. For example, in Company A, structured internal communication channels, such as working groups and digital platforms, are integral to ensuring that innovations and solutions are effectively disseminated across the organisation. This approach mirrors the findings of De Jong et al. (2015) and Babu (2018), who highlight the significance of transparency and collaboration in fostering collective learning and innovation. Similarly, Company B employs regular internal meetings and digital tools to facilitate idea collection and discussion, further emphasising the importance of communication in nurturing a continuous improvement culture.

Leadership also plays a pivotal role in shaping the organisation's communication culture, particularly in innovation-driven environments. In Company E, leaders are instrumental in promoting openness and daily communication, setting the tone for how innovation is perceived and pursued within the organisation. This observation is consistent with the literature, which emphasises the importance of leadership in communicating a clear vision for innovation, maintaining morale during challenges, and ensuring alignment with broader organisational

goals (De Jong et al., 2015). Moreover, ethical communication, as both the data and literature suggest, is crucial for maintaining trust within the organisation, especially in innovation contexts where the excitement of new ideas can sometimes lead to overpromising or unrealistic expectations.

Beyond the organisational boundaries, external communication plays a vital role in extending the innovation dialogue to include stakeholders such as customers, suppliers, and investors. Company D's use of public hackathons and collaboration with the broader tech community is a prime example of how external communication can integrate external ideas and perspectives, driving innovation forward. This approach aligns with the insights of Souitaris (2001) and Sherman (n.d.), who highlight the importance of scanning external information and cooperating with external entities to foster innovation.

The agricultural sector further exemplifies the critical role of external communication, with its extensive networking and collaboration through various forums, digital platforms, and social media. This sector's grassroots communication strategies support rapid innovation and practical application, reinforcing the literature's discussion on the impact of external communication in shaping public image and fostering external collaborations (Ober & Kochmańska, 2023; Croeser, 2022).

However, managing the complexities of communication in a digital age also requires organisations to address the challenges posed by the sheer volume of data and the potential for miscommunication. Company B's experience with varying levels of digital engagement across different cultural contexts underscores the need for tailored communication strategies that consider cultural nuances. This insight is echoed in the literature, which cautions against the potential downsides of digital communication and advocates for a balanced approach that maintains the effectiveness of communication channels.

Ultimately, maintaining consistency between internal and external communication is paramount. As the literature suggests, aligning these messages fosters trust, transparency, and overall credibility (Wells, 2019). The data from various industries, particularly Company A and the agriculture industry, supports this view by demonstrating the importance of coherent communication strategies that integrate both internal and external perspectives to support innovation.

In conclusion, the analysis of communication practices across different industries confirms and extends the insights from the literature on the critical role of communication in driving innovation. While the core principles of transparency, collaboration, and ethical communication are universally applicable, the specific practices and challenges vary across industries. Each sector – automotive, logistics, construction and engineering, construction, and agriculture – demonstrates unique approaches to managing internal and external communication, reflecting their distinct operational contexts and innovation needs. By understanding and effectively managing these communication strategies, organisations can enhance their innovation capabilities and sustain their competitive advantage in an increasingly complex and interconnected business environment.

5.2.3. Tools and Methods for the Governance of Innovation

The strategic use of tools and methodologies is paramount to ensuring that innovation efforts are aligned with an organisation's broader strategic goals and long-term vision. The literature review provides a comprehensive theoretical framework, highlighting a range of tools and methods essential for effective innovation governance. Among these, the Business Model Canvas and Value Proposition Design stand out as foundational frameworks for developing and refining business models, ensuring that innovation efforts are closely aligned with customer needs and adaptable to changing market conditions. The review also emphasises the importance of scenario planning, the Balanced Scorecard, portfolio management, and corporate venturing, all of which contribute to a holistic approach to managing innovation within an organisation.

The practical application of these tools is vividly illustrated in the data analysis, particularly through the insights provided by Interviewee 10. This respondent detailed how tools like the Business Model Canvas and Value Proposition Design are employed within their organisation to foster entrepreneurship and manage complex venture-building projects. These projects, which involve identifying gaps and opportunities from corporate strategic plans and IT sources, reflect a deep integration of innovation governance methods. The emphasis on venture-building highlights the importance of not only generating ideas but also navigating the complexities of bringing these ideas to market, a process that is critical for sustaining innovation in a competitive environment.

Both the literature and the data analysis underscore the critical role of leadership in the governance of innovation. The literature discusses leadership as essential in setting the tone for innovation, aligning efforts with a clear vision, and maintaining morale, especially during times of crisis. Similarly, the insights from Interviewee 10 working in Company G focus on the challenges of fostering a corporate culture that supports innovative thinking. The difficulty in

shifting the corporate mindset towards a more startup-like approach, particularly among employees, managers, and directors, underscores the broader challenges faced by many organisations in embedding innovation into their core operations. This challenge is particularly pronounced in larger, more established corporations, where entrenched ways of thinking can hinder the adoption of new, innovative practices.

Interestingly, the other interviewees did not address the topic of innovation governance tools and methods, which could suggest that these strategic functions are typically the domain of those in specialised roles, such as senior leaders or innovation managers. This aligns with the literature's emphasis on the need for a structured and multifaceted approach to innovation governance, where specific tools and methods are integral to managing and guiding innovation efforts effectively.

Overall, the comparison between the literature review and the data analysis reveals a strong alignment between the theoretical underpinnings of innovation governance and its practical application within organisations. While the literature provides a broad, strategic overview, the data analysis offers tangible examples of how these strategies are implemented on the ground. Both perspectives highlight the importance of structured tools and methods in driving innovation, as well as the significant role of leadership in fostering a culture that embraces experimentation and continuous improvement. Together, these insights provide a comprehensive understanding of how innovation governance can be effectively managed to ensure long-term success.

5.2.4. Roles of Innovation

In examining the roles of innovation across different companies operating in various sectors, it becomes evident that the structure and focus of these roles are deeply influenced by the specific needs and challenges of each sector. The literature provides a robust theoretical foundation for understanding these roles, emphasising the importance of leadership, strategic alignment, and cross-functional collaboration in driving successful innovation. Roles such as the Chief Innovation Officer (CINO) and Innovation Manager are highlighted as crucial for ensuring that innovation efforts are aligned with organisational goals and contribute meaningfully to long-term business success (Hübner, 2023; Maier & Brem, 2018).

The CINO, in particular, is identified as a pivotal figure in the literature, responsible for bridging the gap between various departments and ensuring that innovation is integrated across the organisation. The CINO's role involves overseeing the innovation portfolio, fostering a culture of creativity, and ensuring that innovation initiatives are strategically aligned with the organisation's long-term objectives (Stevenson & Euchner, 2013; Evans, 2021). This theoretical perspective underscores the importance of having dedicated leadership roles that can drive innovation at a strategic level, ensuring that resources are allocated effectively and that innovation is not confined to silos (Jain & Schulman, 2018; Servatius, 2012b).

However, the data analysis reveals that the practical implementation of these roles can vary significantly across different industries. In Company A, for instance, innovation is managed through highly specialised and centralised departments dedicated to improvement management, market forecasting, and innovation processes. This structured approach ensures that innovation efforts are systematically integrated into the company's broader strategy, reflecting the complexity and scale of the industry. However, the sheer volume of products and operations presents ongoing challenges in managing innovation effectively and avoiding duplication of efforts.

In contrast, Company B demonstrates a more decentralised approach to innovation. While there is an openness to innovation across the company, with employees encouraged to contribute ideas, the roles related to innovation are less formalised and often confined to specific departments such as digitalisation. This lack of clear structure can lead to challenges in managing innovation effectively, as responsibilities and priorities may be unclear, potentially hindering the overall impact of innovation efforts. Notably, Interviewee 4 expressed uncertainty about specific tasks or roles related to innovation, indicating possible gaps in communication or role clarity within the organisation. This sentiment is further supported by insights from Interviewee 5, who highlighted the challenges of replacing long-established processes with innovative solutions and generating ideas that are both creative and practical within the existing organisational framework.

Company D, on the other hand, showcases a more formalised approach with specific roles such as Open Innovation Facilitators, who are responsible for managing external collaborations and integrating these into the company's innovation processes. This company's focus on leveraging external networks to drive innovation is consistent with the literature's emphasis on the importance of cross-functional collaboration and external engagement in fostering innovation (de Jong et al., 2015). In the construction industry, there is a strong emphasis on digitalisation, with significant investments in personnel and tools aimed at enhancing process efficiency through innovations like automated documentation and digital construction management. However, both companies face distinct challenges: Company D must manage and maintain its external innovation ecosystem effectively, while Company E grapples with integrating new digital tools into traditional workflows.

In Company G, there is a comprehensive and strategic approach to innovation governance. This includes fostering entrepreneurship through programmes that develop employees' ideas, executing complex venture-building projects, and creating ecosystems that support innovation.

The role of the CINO is highlighted as critical in aligning innovation with corporate strategy, ensuring that innovation efforts are not only strategically aligned but also resourced and supported across the organisation. Interviewee 10 elaborated the primary challenge being the need to shift corporate mindsets towards a more startup-like, innovative approach, particularly within large, established corporations.

Company C presents a different landscape, where innovation roles are more dispersed across various departments. These roles are often focused on making cities more attractive and future-proof through sustainable initiatives such as electromobility and photovoltaic systems. The decentralised nature of innovation in this sector reflects the public sector's unique priorities, where the impact on society and sustainability takes precedence. However, this also presents challenges in balancing innovation with the often slow-moving bureaucratic processes, ensuring that resources are used efficiently while still meeting public expectations.

A key insight from this comparative analysis is the contrast between centralised and decentralised approaches to innovation. In Companies A and D, innovation roles are centralised within specialised departments, allowing for a more structured and strategic approach. Conversely, in Companies B and C, innovation roles tend to be more decentralised, which can lead to challenges in coordination and effectiveness. Additionally, the uncertainty expressed by some interviewees regarding the specific responsibilities of innovation roles suggests a need for better communication and role definition in certain organisations.

Across all sectors, the role of leadership emerges as a critical factor in driving innovation. Whether through the strategic alignment provided by a CINO or the support from top management in municipal settings, effective leadership is essential in integrating innovation into the broader organisational strategy. Furthermore, sector-specific focuses reveal that industries like automotive and construction prioritise process efficiency and technological advancement (Vahs & Brem, 2015; Cheng & Love, 2022), while construction and engineering

and agnostic sectors emphasise external collaboration and strategic alignment. Municipal administration, with its public sector focus, highlights societal impact as a key driver of innovation.

Despite the differences in structure and focus, common challenges emerge across sectors. These include the need for alignment between innovation efforts and organisational strategy, the integration of new tools and processes, and the management of innovation across different levels and departments. The complexity of these challenges varies, but they underline the importance of a well-coordinated approach to innovation governance.

In conclusion, the roles of innovation across different industries are shaped by the specific demands and challenges of each sector. While the approaches may differ – ranging from highly centralised and structured to more decentralised and open – the underlying principles of aligning innovation with strategic goals, fostering effective leadership, and managing the integration of innovation processes remain critical for success. As organisations continue to navigate the complexities of innovation, these insights provide valuable guidance on how to structure and manage innovation roles to maximise impact and drive long-term success.

5.3. Metrics

In the analysis of Key Performance Indicators (KPIs) related to innovation management, both the literature and data from real-world practices provide valuable insights into how organisations measure and manage their innovation activities. A comparative analysis reveals several key takeaways that highlight the alignment as well as the gaps between theoretical frameworks and practical application.

One of the most striking areas of alignment is in the focus on financial and strategic KPIs. Both the literature and data analysis underscore the importance of measuring the financial impact of innovation activities and ensuring that these efforts are strategically aligned with broader business goals. This shared emphasis reflects a common understanding across theory and practise that financial returns and strategic direction are critical to the success of innovation initiatives.

However, when it comes to Innovation Output Metrics, such as the number of patents or the success of new innovations, a noticeable divergence emerges. The literature heavily emphasises these metrics as key indicators of innovation success. In contrast, the data analysis shows that these metrics are less frequently prioritised in practice, suggesting that while innovation outputs are theoretically valued, they may not be as prominently featured in day-to-day management and reporting within organisations.

Employee Engagement and Organisational Culture also emerge as significant areas of focus in both contexts. KPIs related to the participation of employees in innovation activities and the generation of new ideas are consistently highlighted, indicating a widespread recognition of the importance of fostering a culture that encourages innovation at all levels of the organisation.

Risk Management and Experimentation, while acknowledged in both the literature and the data, receive a more comprehensive treatment in theoretical frameworks. The literature not only

addresses the need to track failures and learn from them but also emphasises the importance of allocating budgets specifically for experimentation and maintaining an organisational tolerance for risk. This broader perspective on managing risk in innovation could offer practical organisations additional strategies for fostering a more dynamic and resilient innovation environment.

Another notable difference is found in the area of External Collaboration. The literature strongly advocates for metrics related to external partnerships, such as investments in startups and the formation of joint ventures. However, these metrics are noticeably absent from the data analysis, which may indicate a gap between the strategic recommendations found in theory and the actual practices within the organisations studied. This suggests that organisations might not be fully capitalising on external sources of innovation or that these activities are not being adequately measured.

It is also important to note that there are differences in how these KPIs are prioritised across different companies operating in various industries. For instance, while companies like Company A may focus heavily on metrics related to product refinement and cost efficiency, other companies, such as Company D, might prioritise innovation speed and client satisfaction. These industry-specific differences highlight the need for a tailored approach to KPI selection, ensuring that the metrics used are relevant to the unique challenges and objectives of each sector.

The following table not only highlights the areas of convergence between theory and practice but also brings attention to the discrepancies that could inform future improvements in how organisations measure and manage innovation.

Table 8: Comparison between KPIs from Literature and KPIs from Data Analysis

Category	KPIs from Literature	KPIs from Data Analysis	Observations
Innovation Output	Number of patents; Number of new patents generated; Number of innovative projects; Number of innovations that have made a considerable impact on the business	-	Literature focuses more on innovation output metrics like patents and successful innovations, which were not explicitly mentioned from the interview participants.
R&D Investment & Resources	Total number of employees in R&D; Percentage of R&D expenses in relation to sales; Resources invested in R&D (financial or human)	-	Literature provides more detailed KPIs regarding the allocation of resources to R&D, which are not specifically mentioned from interview participants.
Project & Portfolio Management	Number of projects in active development; Deviation from the schedule; Budget deviation; Projected value of R&D pipeline	New projects (IDs 3:47, 4:19); New locations (ID 3:48); Tenders (ID 3:49)	Both analyses cover project and portfolio management, but the data analysis focuses more on the initiation and location of projects.
Financial Performance	Net present value of new products/services; Financial return to business; Profit from new product sales; Cost reduction relative to R&D investment	Financial indicators to measure the success of innovation (IDs 4:40, 4:44); Strategic focus on financial performance and cost reduction (ID 4:45)	Both analyses place a strong emphasis on financial performance, with some KPIs overlapping, particularly in assessing profitability and cost reduction.
Time-to-Market & Speed	Time-to-market; Targeted vs. actual break-even time	-	Literature highlights speed-related metrics, which are not explicitly discussed in the data analysis.

Category	KPIs from Literature	KPIs from Data Analysis	Observations
Productivity & Efficiency	Comparative manufacturing costs; Accomplishment of project milestones; Achievement of R&D pipeline objectives	Market share trends (ID 5:21); Productivity metrics for systems and processes (ID 3:46)	Both emphasise efficiency, but the literature provides more specific metrics related to manufacturing and project milestone tracking.
Market & Sales Impact	Market share trends; New product sales; Sales or gross profits from new products	Percentage of sales of the current year concerning new products and services (ID 3:45); Number of products sold in recent years (ID 4:41)	Both analyses highlight the importance of market and sales impact, with significant overlap in measuring sales from new products.
Strategic Alignment & Leadership	Strategic alignment with business; Leadership effectiveness in driving innovation; Alignment of leadership vision with overall strategy	Leadership priorities in project delivery and innovation alignment with company goals (IDs 7:13, 7:20)	Both analyses stress the importance of strategic alignment and leadership, though the literature delves deeper into formal processes and training.
Employee & Organisational Engagement	Participation rates in innovation workshops; Number of implemented ideas generated by employees; Collaboration and knowledge-sharing	Innovation culture indicators (ID 4:42); Employee participation in innovation initiatives (ID 4:47)	Employee engagement is a strong focus in both analyses, particularly around participation and idea implementation.
Risk & Experimentation	Tolerance for experimentation; Time/resources for unconventional ideas; Budget for experimental projects	Number of failed innovation projects and the lessons learned (ID 7:13); Percentage of budget for high-risk innovation projects (ID 7:20)	Both analyses cover risk and experimentation, with the literature focusing on budget and tolerance and the data analysis on learning from failures.

Category	KPIs from Literature	KPIs from Data Analysis	Observations
External Collaboration	Investment in external startups; Number of joint ventures or alliances; Percentage of R&D budget for collaborations	-	External collaboration is more prominently featured in the literature, suggesting a strategic emphasis not echoed in the data analysis.
Quality & Reliability	Product quality and reliability	-	Quality and reliability are discussed in the literature but not explicitly in the data analysis.

In conclusion, while there is considerable overlap between theoretical KPIs and those observed in practice, there are also key areas where either theory or practice might benefit from greater attention. For instance, the practical application of KPIs related to external collaboration and risk management could be enhanced by drawing on the comprehensive strategies suggested in the literature. Similarly, the theoretical frameworks could gain from a closer examination of how KPIs are used in real-world settings to ensure they remain relevant and actionable in diverse organisational contexts. By bridging these gaps, organisations can develop a more comprehensive approach to innovation management that is both theoretically sound and practically effective.

5.4. Limitations

While this study offers valuable insights into innovation practices, several limitations should be acknowledged that may influence the interpretation of its findings. One of the primary limitations is the relatively small sample size, with only ten interviews conducted. This makes it difficult to draw comprehensive conclusions about specific industries, as the findings may reflect the practices of the individual organisations rather than the broader industry trends. Furthermore, the majority of participants are German, which could lead to an overrepresentation of innovation practices shaped by German cultural norms. As a result, the findings may not fully capture the nuances of innovation across different cultural contexts.

Another limitation is the difficulty in comparing small, medium, and large-sized companies due to the limited sample size. With a larger and more varied sample, more meaningful comparisons could be made across different organisational sizes. Despite these challenges, the study identifies emerging trends that could serve as a foundation for future research. Expanding the sample size and incorporating quantitative methods in subsequent studies would help to validate and potentially extend the findings presented here.

The study also operates on several key assumptions, including the expectation that participants provided honest and accurate responses during the interviews. Additionally, the practices and challenges discussed are presumed to be representative of broader industry trends. However, given the focus on specific sectors and the small sample size, the generalisability of the results to other industries or cultural contexts may be limited. Future research could address these issues by employing a more diverse and larger participant pool, enabling a more robust analysis of innovation practices across various industries and organisational contexts.

6. Conclusion

This master's thesis has explored key aspects of innovation management with a particular focus on the practical dimensions of organisational innovation. The research questions underpinning this study are:

1. What are the key dimensions of organisational innovation, and how do they impact business success?
2. What innovation practices are currently utilised by organisations, and what additional practices could be implemented to enhance innovation?
3. How can the success of innovation initiatives be effectively measured and assessed within organisations?

In addressing these questions, the practical dimensions of organisational innovation identified in this thesis are structured around three essential areas:

Idea Management: This process encompasses several phases, starting with idea generation, mapping, evaluation, and selection, and extending to the rejection of ideas. This is followed by the phases of experimentation, execution, and adaptation, and finally, project review. Each of these stages plays a crucial role in the innovation process, ensuring that only the most promising ideas are pursued and brought to fruition. A systematic approach to idea management can significantly enhance an organisation's innovative capacity.

Innovation Governance: This includes incentives, various roles within innovation, the tools and methods employed, as well as internal and external communication. A well-structured innovation governance system ensures that innovation is not only encouraged but also effectively managed. Incentives motivate employees to actively participate in innovation processes, while clear role definitions and appropriate tools and methods make the innovation

process efficient and focused. Moreover, transparent communication, both internally and externally, supports knowledge transfer and collaboration within and outside the organisation.

Metrics: The development and application of metrics and KPIs are crucial for making the success of innovation initiatives measurable. The structure developed in this thesis demonstrates how a combination of objective and subjective metrics allows for a comprehensive assessment of innovation performance. These indicators assist organisations in monitoring their innovation processes, identifying weaknesses, and continuously making improvements.

The study has shown that organisations have implemented different practices for fostering innovation depending on their specific industry-driven need. Implementing agile methods such as Scrum or Kanban, along with applying Design Thinking, promotes organisational flexibility and adaptability. Furthermore, it has been found that the introduction of innovation governance mechanisms and the targeted use of metrics can further enhance an organisation's innovative capabilities. It is recommended that, in addition to existing practices, companies should increasingly focus on fostering an innovation-friendly culture and creating spaces for creative thinking that is adapted within their industry-specific needs.

The thesis emphasises the necessity of a holistic approach to measuring innovation success, which includes both quantitative and qualitative metrics. A balanced set of KPIs enables organisations to accurately track the progress of their innovation projects and make data-driven decisions. By combining different evaluation approaches, organisations can ensure that both short-term successes and long-term innovation goals are taken into account.

In conclusion, this master's thesis has demonstrated that the practical dimensions of organisational innovation – specifically idea management, innovation governance, and the application of metrics – are central to the long-term success of innovation initiatives.

Organisations that systematically integrate these dimensions into their innovation process can sustainably enhance their competitiveness. The findings of this research provide valuable insights and practical recommendations for organisations looking to further develop their innovation capabilities.

This study contributes to the existing body of knowledge in innovation management by outlining concrete, practice-oriented structures and strategies that can be applied across industries. Future research could focus on refining these approaches and examining their application in specific industries or under particular market conditions.

7. End Matter

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7.2. Appendix

7.2.1. Questionnaire for my master thesis (English and German Versions)

Questionnaire for my master thesis

~ ENGLISH VERSION ~

Section 1: Demographic Information

1. What is/are your nationality/ies? Approximately what age are you currently?
2. What is your role within the organisation? Specifically, what are your key tasks, priorities and challenges?
3. Do you have some leadership responsibilities?
4. How many years have you been working in this organisation?
5. In which industry does your organisation operate?

Section 2: Organisational Innovation Dimensions

6. What does it mean to innovate within your company? What are the priorities from this point of view?
7. What specific practices or strategies does your organisation currently use to foster innovation?
    a. *Generate, map, collect, select & reject ideas*
        i. What mechanisms exist in your organisation to collect and implement ideas from employees?
        ii. How do you and your colleagues typically handle new ideas? Can you share an example of a successful idea contributed by an employee?
    b. *Experiment, execute & adapt ideas/ projects*
        i. Do you work with (agile) frameworks? If so, which ones and how have they helped being innovative?
        ii. Do you have the opportunity to experiment/ test your ideas to develop and improve them?

c. *Evaluate innovation success* (Key Performance Indicators (KPIs), e.g., number of new products, revenue growth, market share)
    i. What key performance indicators (KPIs) does your organisation use to evaluate innovation success (e.g., number of new products, revenue growth, market share)?

d. *Communication (internal & external)*
    i. Do you have open communication channels with people from other departments (to get new ideas/ talk about new ideas) or even people outside of your company to discuss ideas/ improvements?

e. *Roles of Innovation*
    i. Are there any specific roles supporting innovation? If so, what are their specific tasks, responsibilities and priorities? What benefits have they brought to the company?

f. *Incentives*
    i. Are there any specific incentives used to support innovation?

8. What benefits has (pick one example named in question 7) brought?
9. In your opinion, what are the biggest barriers to innovation in your organisation?
10. Do you have materials (e.g. PP presentations, docs, outcomes, etc.) you can share?

Fragebogen für meine Masterarbeit

~ DEUTSCHE VERSION ~

Abschnitt 1: Demographische Informationen

1. Welche Nationalität(en) haben Sie? Wie alt sind Sie ungefähr?
2. Welche Position haben Sie innerhalb des Unternehmens inne? Welche Funktion/ welcher Bereich (z.B. Marketing, Finanzen, etc.)
3. Haben Sie eine gewisse Führungsverantwortung?
4. Wie viele Jahre arbeiten Sie bereits in dieser Organisation?
5. In welcher Branche ist Ihr Unternehmen tätig?

Abschnitt 2: Organisatorische Innovationsdimensionen

6. Was bedeutet es, in Ihrem Unternehmen zu innovativen Maßnahmen zu greifen? Was sind die Prioritäten in dieser Hinsicht? Welche spezifischen Praktiken oder Strategien wendet Ihr Unternehmen derzeit an, um Innovationen zu fördern?
    a. Ideen generieren, erfassen, sammeln, auswählen und verwerfen
        i. Welche Mechanismen gibt es in Ihrem Unternehmen, um Ideen von Mitarbeitern zu sammeln und umzusetzen?
        ii. Wie gehen Sie und Ihre Kollegen normalerweise mit neuen Ideen um? Können Sie ein Beispiel für eine erfolgreiche Idee nennen, die von einem Mitarbeiter eingebracht wurde?
    b. Experimentieren, Ausführen und Anpassen von Ideen/Projekten
        i. Arbeiten Sie mit (agilen) Frameworks? Wenn ja, welche sind es und wie haben sie Ihnen geholfen, innovativ zu sein?
        ii. Haben Sie die Möglichkeit, Ihre Ideen zu erproben (Experimente, Tests,…), um sie zu entwickeln und zu verbessern?
    c. Bewertung des Innovationserfolgs (Key Performance Indicators (KPIs), z. B. Anzahl der neuen Produkte, Umsatzwachstum, Marktanteil)
        i. Welche wichtigen Leistungsindikatoren (KPIs) verwendet Ihre Organisation zur Bewertung des Innovationserfolgs (z. B. Anzahl neuer Produkte, Umsatzwachstum, Marktanteil)?
    d. Kommunikation (intern und extern)

        i. Haben Sie offene Kommunikationskanäle mit Leuten aus anderen Abteilungen (um neue Ideen zu bekommen/über neue Ideen zu sprechen) oder sogar mit Leuten außerhalb Ihres Unternehmens, um Ideen/Verbesserungen zu diskutieren?

    e. Rollen der Innovation
        i. Gibt es bestimmte Rollen in Ihrem Unternehmen, die die Innovation unterstützen? Wenn ja, was sind ihre spezifischen Aufgaben, Verantwortlichkeiten und Prioritäten? Welchen Nutzen haben sie dem Unternehmen gebracht?

    f. Anreize
        i. Gibt es besondere Anreize zur Förderung der Innovation?

7. Welchen Nutzen hat (wählen Sie ein in Frage 7 genanntes Beispiel) gebracht?
8. Was sind Ihrer Meinung nach die größten Hindernisse für Innovationen in Ihrem Unternehmen?
9. Haben Sie Materialien (z. B. PP-Präsentationen, Dokumente, Ergebnisse usw.), die Sie weitergeben können?

7.2.2. Link to Codes used in my Master Thesis

Codes used for the Analysis of my Master Thesis

https://docs.google.com/spreadsheets/d/1yqTjaiVWB-eSaol634dGail8rNsl2fol8JaG2cJB97s/edit?usp=sharing