Process Design for Digital Innovation Portfolio Management

A MASTER THESIS REPORT

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Graduation Committee

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Master Thesis Report

Process Design for Digital Innovation Portfolio Management

Master thesis submitted to Delft University of Technology in partial fulfillment of the requirements for the degree of

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Acknowledgments

The report that you're about read right now titled "Process Design for Digital Innovation Portfolio Management" presents my research on the steps used to design a process for innovation portfolio management of digital innovation projects undertaken by rental equipment companies. This research was in collaboration with Riwal Holding Group where I was working as an intern in their digital innovation team. The thesis was written to complete the Management of Technology program's graduation requirements at Delft University of Technology (TUD). I began this journey of pursuing a Master's degree with my grandfather as my inspiration. A teacher himself, his sense of curiosity and thirst for knowledge deeply resonated in me. This journey has changed me as a person and has molded me into a better version of myself. This thesis is the final phase of my journey as a Master's student and was made possible by the support of several people. Therefore, I would like to convey my deepest gratitude to them at the beginning of this report.

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Executive Summary

If you look at history, innovation doesn't come just from giving people incentives; it comes from creating environments where their ideas can connect. This quote by Steven Johnson is relevant to innovation in all spheres. Businesses use digital innovation to improve operations and boost efficiency, making it a need in the current world. By consistently introducing new technologies that enhance the consumer experience, it enables businesses to stay one step ahead of their rivals. The use of digital technology to solve current business problems is referred to as "digital innovation." For companies to innovate and provide solutions to their customers, they must also manage these different innovation activities effectively. If they fail to do so, projects may remain in the pipeline creating a pipeline gridlock. Projects in a portfolio need to be evaluated in ways that meet a company's objective. This requires the organization to implement effective innovation portfolio management strategies. This is challenging for businesses operating in traditional industries such as the equipment rental business, construction, mining, and so on. If these industries do not incorporate digitalization and digital innovation project management methodologies, they may become industry laggards and fail to keep up with the world's pace. As a result, it is crucial for these industries to develop and manage their innovation portfolio appropriately.

To strategically manage its digital innovation portfolio, Riwal Holding Group, a company who are specialists in providing solutions with aerial work platforms (AWP) began to investigate different approaches. The company has its headquarters in the Netherlands but operates in different parts of Europe,the Middle East and India. This research was carried out by studying Riwal's processes and their ambition to become a digital leader in the rental equipment business. Through this research Riwal (and other rental equipment companies) can adopt a process that can help in their digital innovation portfolio management (IPM).

To achieve this, the main research question for this study is formulated as:

How can an international rental equipment and sales organization manage their digital innovation portfolio?

Although digitalization and digital innovation have been themes emerging in the past decade, there's limited literature on digital IPM strategies. There is no common, widely used solution that is present as IPM is subjective to many factors and challenges relative to the company, the industry it operates in, the nature of its customers and the market it operates in. The literature related to IPM in the rental equipment industry is far more scarce, thus making this research unique.

In order to better comprehend the topic at hand, the research issue was addressed utilizing a qualitative methodology that included triangulation techniques. In this study, information is gathered through desk research and interviews, which could lead to accurate and meaningful results. The interviews provided further evidence for the data gathered from the desk study. Additionally, the interviewing procedure revealed additional knowledge that was really pertinent and compelling, particularly from the viewpoint of an organization. Using the data gathered, a process was designed and tested. The process consists of theoretical models discovered from the desk research and was modified using the results obtained from the interviews. It was then

tested within an organization. The limitations observed during the test were then addressed with suitable recommendations.

The results of the study allow us to implement a process as a tool to evaluate the digital IPM of a rental equipment firm. Combining all the findings from primary and secondary sources, a stage-gate hybrid model was used as the foundation for the process design. The study also highlights challenges that the organization needs to address while incorporating an IPM strategy. The business may manage its portfolio of digital innovations by strengthening the process and using this procedure consistently. Although research has its limitations, it also offers chances for additional investigation. The approach developed in this study is suitable for Riwal's digital innovation team. This may not apply to some organizations of different types. However, the techniques used in this thesis may be replicated to establish an acceptable process for several organizations. A strategy that incorporates supplementary forms of assessment, such as surveys or questionnaires with other firms in the equipment rental industry, can be utilized to broaden the research.

Keywords: Digital Innovation, Innovation Portfolio Management, Digital Transformation, Portfolio Evaluation, Portfolio Prioritization, Rental Equipment, Framework for portfolio management, Process Design for Innovation Portfolio Management

Contents

List of Figures

List of Tables

Acronyms

AR - Augmented Reality

AWP - Aerial Work Platforms

B2B - Business to Business

B2C - Business to Customer

BIM - Building Information Modeling

CO2 - Carbon dioxide

COVID-19 - Coronavirus Disease 2019

DMI - Digital, IT and Marketing

ERA - European Rental Association

GPS - Global Positioning System

HREC - Human Resource Ethics Committee

IoT - Internet of Things

IPM - Innovation portfolio management

IT - Information Technology

MCDM - Multi-Criteria Decision Making

NPV - Net Present Value

RAPID - Recommend, Agree, Perform, Input, Decide

RHG - Riwal Holding Group

ROI - Return on Investment

SPOC - Single Point of Contact

SQ - Sub-research Question

VR - Virtual Reality

1 Introduction

Digital innovation has become important in today's environment, with firms embracing digital tools to improve processes and to enhance efficiency. Traditional product developments have lost prominence in favor of new business models offered by digital technology platforms (Ciriello, Richter, & Schwabe, 2018). Digital innovation is no longer only the domain of software firms. Because software is a crucial distinctive component and an innovation facilitator in the majority of today's products, processes, or services, a growing number of businesses are embracing digital innovation (Yoo et al., 2012). Business-to-Customer (B2C) companies are not the only ones that may benefit from digital business models. They also impact how suppliers and service providers collaborate in Business-to-Business (B2B) environments. On an institutional level, collaboration with partners, suppliers, customers, and other stakeholders throughout the value chain entails a more in-depth and complete exchange of information, including data for efficient planning and production.

Moving away from viewing IT as a commodity or as a piece of machinery to keep the business operating is a particular challenge for many organizations. It is difficult for established firms to overcome the barriers imposed by their legacy organizational style and structure. It is exceedingly difficult to make a major transformation in an organization that was developed with a top-down organizational model. Particularly if the change necessitates a totally different organizational style and culture, as is the case with digital innovation (Hendrichs & Tse, 2015). Building a customer-centric business leveraging digital technologies to acquire greater accessibility and intimacy with all partners throughout the ecosystem will result in a fundamental shift in traditional organizations.

Equipment rental, also known as plant hire in some countries (for example, the United Kingdom), is a service industry that provides machinery, equipment, and tools of all types and sizes (from earth-moving to powered access, power generation to hand-held tools) for a limited time to end users, primarily construction contractors but also other industries and individual consumers. Renting may be characterized as obtaining equipment for a temporary purpose in order to assist those who are unable to purchase the equipment. The status of Europe's equipment rental business differs by nation, with certain markets being more advanced than others.

Digital technology, such as telematics, online self-service tools, and fleet management systems, enable construction crews to discover and accomplish what they need, regardless of where they are or what device or gear they are using. Such solutions may assist contractors of all sizes in better managing complicated projects and addressing underutilized equipment such as excavators, loaders, aerial work platforms, and many others(United Rentals Inc, 2021). There are several aerial work platforms on-site at major construction projects or industrial sites, which causes issues such as keeping track of rental contracts and invoices. The conventional method of controlling this procedure necessitates nearly continuous communication with the rental provider. In recent years, new innovations in the equipment rental business have emerged, especially in the form of online platforms. Several firms provide digital solutions to clients' rental needs, working as a facilitator between customers and rental providers.

Companies may access their whole rental history online, reserve more equipment, and offrent a machine. Because people can accomplish all of these acts from any location at any time, communication becomes far more successful (Riwal Holding Group, n.d.-a). Equipment

rental firms can now automate preventative maintenance schedules, inspections, and work order procedures due to the Internet of Things (IoT) and digital solutions. Many companies from different industries are changing their old legacy systems to new and automated digital systems. However, some industries are still slow to adapt to this change. The equipment rental industry is one of them. Because of the traditional nature and mechanistic structure of this industry, adopting digital solutions has been slow but many organizations are slowly changing their practices to provide digital solutions to their customers. With such crucial technology shifts and changes in the technology landscape, the prioritization of different digital innovative processes is a fundamental challenge for organizations that are new to adopting a B2B digital process. The process of incorporating digital solutions in general is a complex process as there is no 'one fit for all' process for organizations to adopt. In the industry of rental equipment, the process for these innovations is subjected to numerous challenges due to several factors. Digital service innovations are considered new business fields for rental equipment firms and are at the forefront of many discussion in practice. However, it is unclear to what extent existing innovation portfolio management (IPM) has recognized how to manage a portfolio of service and digital service innovations.

1.1 Problem Context

This research study on digital innovation portfolio management is being conducted in conjunction with the Digital Innovation Team of Riwal Holding Group (RHG) in their headquarters in Dordrecht, Netherlands. In 16 different countries, Riwal Holding Group is one of the largest professionals in the field of operating safely and effectively at heights. The company has chosen to specialize in one field - "powered access equipment," which includes aerial work platforms, telehandlers, and forklift trucks. Riwal operates throughout Europe, the Middle East, India, the United Arab Emirates, and Kazakhstan (Riwal Holding Group, n.d.-b). Riwal continues to strive in order to provide the most creative solutions to their customers. As a result, Riwal introduced a few digital innovation solutions such as BIM (building information modeling), Virtual reality (VR) and My Riwal. BIM is the process of creating BIM files, which are digital 3D representations of physical objects such as buildings, equipment, furniture, and landscape. Customers have better control over the machines and may decrease or eliminate failure costs and carbon emissions by using Riwal's aerial work platform BIM models. Riwal has recently implemented virtual reality simulators as an efficient training approach to improve workplace safety and productivity. VR training simulators provide a controlled environment in which operators may train, boosting personal safety for new operators and saving huge amounts of money lost due to equipment and infrastructure damage. My Riwal is Riwal's innovative customer platform, which is accessible from any web browser or app, at any time and from any location. My Riwal is a digital portal where its customers may obtain additional information on the rental process in order to save money and monitor equipment utilization (Riwal Holding Group, n.d.-c).

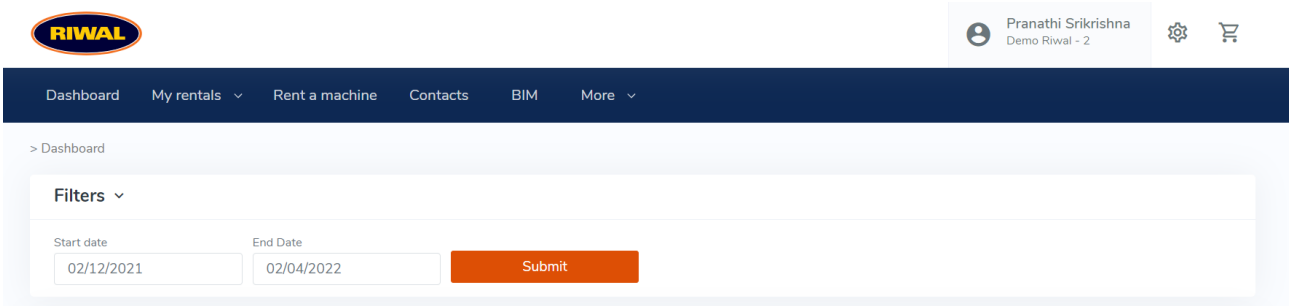

Figure 1: My Riwal - Riwal's web platform tabs

Figure 2: My Riwal - Riwal's web platform

This research was developed keeping in mind the future expansion plan of expanding the functionalities of My Riwal as well as other projects of the digital innovation team of RHG. The digital innovation team consists of two units - digital supply and digital demand. The digital supply team comprises of developers, testers and technical experts who are involved in building and developing digital solutions for Riwal's customers. The digital demand team acts as the face of digital innovation team and is involved in project management, scaling up solutions to different countries, ideation of new solutions and meeting customer expectations. Riwal aims to become a digital leader in the rental equipment industry with new solutions that add value to the customer's experience while automating the rental process. However, the company lacks expertise in evaluating the potential of different digital initiatives as the emergence of digital solutions is new in this industry. Current evaluation and prioritization processes involve business votes based on intuition and word of mouth statements with no customer research. This creates a project pipeline gridlock with many projects but too few resources to implement them.

1.2 Scientific and Societal Relevance

The scientific relevance of the problem context mentioned above is to formulate qualitative and empirical insights for digital innovation and digital transformation project management in the

rental equipment industry. The concepts of project portfolio management and innovation are well-established in the scientific literature. However, there is a scarcity of knowledge in the area of digital innovation portfolio management in traditional industries such as the equipment rental. In this research, theoretical process designs are investigated and using empirical findings, the designs were modified for a rental equipment organization. No research has been done on project or portfolio management in the rental equipment industries. While there are several independent investigations on the importance of digital transformation in the rental equipment industry, there is no literature on how the company should prioritize these digital innovation activities or processes within the rental equipment organizations. Thereby, this research is scientifically relevant as it provides qualitative research on these topics along with a conceptual process design for digital IPM in a rental equipment organization.

The problem context mentioned above is relevant to society as digital transformation in the rental equipment industry is becoming more relevant after the Covid-19 pandemic. With renting equipment being a more sustainable option than buying machines, construction companies are switching to partner with equipment rental businesses. Legislation to reduce carbon footprints as well as increase sustainable development in the construction industry will make it important for digital solutions to monitor and use machine data as action points. Therefore equipment rental businesses need to prioritize on future proof solutions and thus need to strategically evaluate their digital innovation portfolio. This research's findings and process designs can be used to facilitate discussions among decision-makers in a portfolio setting, which can help the rental equipment firm choose and rank strategic projects under the umbrella of digital innovation.

1.3 Research Objective

The primary goal of this research is to investigate the expansion of digital solutions by assisting in the design of a process to evaluate and prioritize innovations in a traditional industry such as the rental equipment industry which is seeking to change its method of operations. In order to improve the scalability of any solution, it is important to have a structured process in place to identify opportunities that can be exploited and to discard innovation processes that may not be the right fit for the organization or its customers. Therefore, it is important to focus on designing a process to help with digital innovation portfolio management. This leads to the primary research objective of the proposed study:

To develop a process to evaluate, prioritize and validate the digital innovation activities in an international rental equipment and sales organization.
To achieve the main objective, the research aims to present its outcome in the form of a process design. Therefore, this research aims to achieve the main objective by:

1. Understand the market landscape of digital platforms in the rental equipment industry.
2. Understand the contributing factors that aid the development of digital solutions at a rental equipment firm.
3. Understanding the challenges faced during the process of selecting new solutions.
4. Identify appropriate solutions to design a process that fits the rental equipment firm and its work culture.
5. Explore the feasibility of the solutions identified within the rental equipment organization.

To realize the objectives stated above, a research question is required. A set of sub-questions is also required to direct the study. The main research question is:

What steps can be taken by an international rental equipment organization to develop a process for balancing and prioritizing their digital innovation portfolio?
In order to answer this question, several sub research questions were identified. The information gathered from these sub research questions will be used to answer the primary research question. The sub research questions are:

- What are the current trends in digital innovation for the rental equipment industry?
- What are the factors that promote the development of new digital tools in an international rental equipment organization?
- What are the different challenges that impact the prioritization of innovation processes of the digital innovation team in an international rental equipment organization?
- What models can be used to design a process to balance and prioritize the project portfolio of digital innovation in the international rental equipment organization?
- To what extent would these models be feasible to the international rental organization in terms of business operations?

1.4 Thesis Outline

This section discusses the format in which the thesis is structured.

- **Chapter 1:** Outlines the scope of the study, the problem context, the study's objectives, and the main and sub research questions.
- **Chapter 2:** Describes the research design and methods. It also provides information on the methodology used for information collection via interviews and literature search.
- **Chapter 3:** Provides literature review on digital innovation, innovation portfolio management, strategies for innovation portfolio management and reflection of the literature studied
- **Chapter 4:** Research on the market of rental equipment industry, trends and barriers of the industry. Stakeholder analysis of an organization with digital innovation in equipment rental.
- **Chapter 5:** The chapter elaborates on qualitative data results gathered via interviews classified as factors and challenges.
- **Chapter 6:** Provides a process design for portfolio management of digital innovation projects using the results of chapter 3, 4 and 5.
- **Chapter 7:** Elaborates on the implications of the study, limitations and recommendations for the future.
- **Chapter 8:** Addresses the research question and goals from Chapter 1 in order to summarize and conclude the study to demonstrate that its objectives have been fulfilled.

2 Research Design

This chapter will describe the research methods that are used to meet the objectives of this study. The overall research process has been summarized in Figure 4. According to Yin, choosing a research strategy consists of 3 conditions; "the type of research question posed, the extent of control an investigator has over actual behavioral events and the degree of focus on contemporary as opposed to historical events" (Yin, 2009). In this study, the main research question is a 'how' question. The investigator has some control over the behavioral events and the event can be considered as a contemporary event.

To answer the main research question, this study can be divided into two distinct phases. The first phase involves understanding the rental equipment industry and the impact of the digitization in this business.This can be done by answering the first three sub-research questions. The first phase is an exploratory research that includes a literature review, market research, and semi-structured interviews with open-ended questions. The first sub-research question is to understand the rental equipment industry in detail along with patterns that can be identified in this particular industry. It is important to understand the industry in order to provide a solution that is appropriate and not vague. This question will be answered by secondary data sources collected by literature review (research articles, journal papers, scientific studies and verified reports found from other than academic publications) and market analysis. The second sub-research question assists us in determining factors that encourage the development of digital tools in the rental equipment business. Criteria for project evaluations in a portfolio can be derived by identifying these factors. A combination of interviews and desk research will be used to address this question. Similarly, the third sub-research topic is concerned with comprehending various challenges associated with digital innovation in the rental equipment market. To design a process that meets the needs of the organization, it is critical that the process address the majority of the challenges. A combination of interviews and desk research is also used to address this topic.

The second phase is concerned with developing a process for evaluating digital innovation portfolios. The method is created utilizing the data gathered in the first phase. This phase provides responses to the final two sub-research questions. Desk research on various portfolio management tools and models is used to answer the fourth sub-research question. A methodology for portfolio evaluation for various digital innovation activities is developed using these models as a reference. Using the data acquired in the first phase, this process is enhanced further. By validating the designed process and addressing any issues that occur during the validation step, the final research question can be answered.

This research will be conducted in Riwal Holding Group with the assistance of their digital innovation department. Riwal intends to migrate many of its services online and invest more in digital innovation as a result of improved digitization and the need for automation in business processes. The organization is in a transition phase and recognizes the importance of the benefits of its solutions such as accessibility, scalability, uniformity in information to customers, and efficiency in business processes. The transition phase of Riwal also implies that the company faces numerous challenges. The challenges of the digital innovation team can be broadly classified into two main areas:

- Understanding, evaluating, and validating the priority of innovations for digital solutions being developed (features, tools, processes, and services)

- Expanding and rolling out the digital solutions to different countries while increasing the user acceptance within these countries.

The first area is perfectly in-line with the research objectives of this study. Due to time constraints, only a few activities will be observed and investigated. Data from within the firm and from its customers is necessary to answer the first three sub-research questions. This would need empirical research. The fourth research question necessitates theoretical investigation.

It is critical to put any research design to the test. There are four specified tests that also serve as a framework for evaluating the quality of major case studies: construct validity, internal validity, external validity, and reliability (Yin, 2018). The construct validity for this case study will be reviewed by the experts at the Riwal. The key methods for carrying out this test are to use different sources of evidence and to have the draft of the case study report evaluated on a regular basis. This is accomplished during the data collecting and composition phase. As per Yin, reliability is used to demonstrate the operations of a study. This is done during the data gathering phase, with methods such as employing a case study procedure, creating a case study database, and maintaining a chain of evidence.

2.1 Research Methodology

A research technique can be classified as qualitative when the study is based on information communicated through language and natural setting behaviors. This research likewise takes a similar strategy to get its conclusions. Qualitative data are data in the form of words, such as interview notes, transcripts of focus group replies to open-ended questions, transcriptions of video recordings, Website descriptions of product experiences, news stories, and so on (Sekaran & Bougie, 2016). A Triangulation strategy was utilized in the qualitative study, in which multiple methods or data sources were used to build a deeper understanding of phenomena (Carter et al., 2014). Method triangulation, one of the four forms of triangulation, is utilized, which involves the use of several ways to acquire data. In this study, data is gathered through desk research and interviews, which could lead us to relevant and valid information (Carter, Bryant-Lukosius, Dicenso, Blythe, & Neville, 2014).

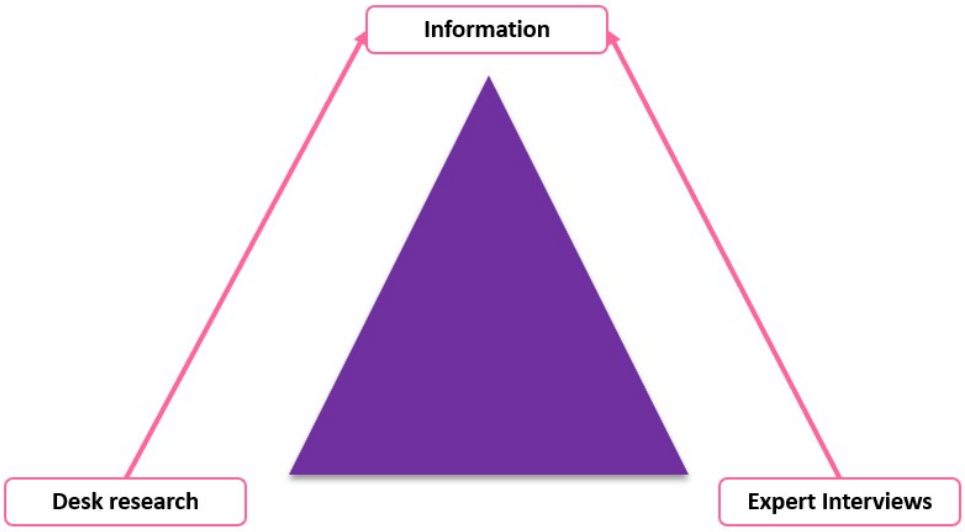

Figure 3: Method Triangulation

Data for the study will be gathered from both secondary (already existing sources) and primary sources (collected from the actual environment). Published reports, surveys, technical documentation, peer-reviewed journals, and gray literature are examples of secondary data sources which involves desk research. Semi-structured interviews with Riwal's managers, customers, and process experts will be the main source of primary data. Expert interviews may be especially effective in examining the organization's implicit knowledge of processes and process gaps, as well as its digital solutions. Secondary and primary data will be collected at the same time. Secondary data may be used to gradually refine interview questions to make them more useful, whereas interviews can be used to look for relevant themes in secondary sources. The combination of primary and secondary data will be used to outline the important factors that need to be incorporated in the design of the portfolio management process.

The study intends to conduct semi-structured interviews that will contain both predetermined questions as well as the interviewee's ability to discuss larger unexplored viewpoints and adjust the questions accordingly. Furthermore, the interview intends to use a funneling method to allow for the gradual asking of open, reflective, and probing questions. Since the research requires knowledge that is specific to a particular sector in Riwal, the participants of the interview must be selected in a purposeful and systematic manner. Therefore, targeted sampling will be used to select interviewees who have an understanding and an expertise in the process. It is necessary that the sampling reflects the interdependencies of teams that is central to this research, the sample must consist of diverse interviewees having experience in the process of decision making and understanding the interdisciplinary nature of the process.

2.2 Literature search

The secondary data is empirical in form, and it provides current knowledge about usable solutions for the management of innovation portfolios. The information gleaned from secondary data must be evaluated and filtered based on the viability of implementing the solutions in the business. This can be based on several factors such as organization culture, the type of process, the type of innovation activities planned, factors identified using primary data.

The main purpose of this literature review revolves around the theme of digital innovation portfolio management. Therefore, the starting point of the search was to understand decision-making processes in innovation-based firms, the types of decision-making involved, and the factors that influence the process. After determining the scope of the review, the relevant literature was searched. The Literature search procedure is as follows: (1) database selection, (2) keyword identification, (3) determination of inclusion and exclusion criteria, (4) database search and refining, and (5) backward and forward search.

Searches were conducted in academic databases such as Scopus and Web of Science, as well as Science Direct and ResearchGate. Therefore, the search was directed toward these areas of interest. An exploratory review was carried out by doing a structured keyword search in the aforementioned academic resources. From the beginning, Scopus was chosen since it is the world's biggest citation database of peer-reviewed literature-scientific journals, books, and conference proceedings.

Relevant keywords were evaluated further in an iterative process of trying search expressions in various databases to evaluate the resultant collection of articles. The keyword search process

can be categorized into Primary research and Secondary research. The primary search process utilized the main keywords that aided in finding relevant literature with these keywords in their title and abstract. Since research is limited in the area of digital innovation portfolio management, a broad study of these innovation portfolio management was done based on the relevance to traditional or conservative industries such as the construction industry. Table 1 below highlights the keyword themes used along with their synonymous keywords that were used to filter relevant sources.

Keyword	Synonmous Words
Digital Innovation	Digitization, Digitalization, Digital Transofrmation, Digital Solutions, Software Innovations, Software Solutions
Innovation Portfolio Management	Project Portfolio Management, Portfolio evalaution, Portfolio strategies,
Portfolio management framework	Portfolio Strategies, Decision making models, Strategic porfolio design, Portfolio prioritization
Factors and Challenges of IPM	Problems in IPM, Advantages of IPM, Limitations of IPM, promoters and barries of IPM

Table 1: Keywords used in preliminary research

The backward search examines the references in the selection of relevant articles to uncover other publications that were overlooked in the database search. In contrast, the forward search discovers more papers that cited the set of articles in this study. Along with literature search, market reports and company reports were used to identify information for market research. These sources were also used to identify trends and barriers in the rental equipment industry. The reason for market research was because there was little to no academic literature on IPM for rental equipment industries or about digital transformation of the rental equipment industry.

2.3 Interviews

A directed, purposeful talk between two or more people is defined as an interview (Sekaran & Bougie, 2016). It is one of the most effective data collection strategies in qualitative research since it helps us to better understand and examine the interviewees' viewpoints, mindsets, and experiences. For this study, a semi-structured interview was chosen from among the available options. This kind is a hybrid of unstructured and structured interviews, with additional open-ended, spontaneous questions added to a formalized list. A consent form and data management strategy were created prior to the interviews. For recorded interviews, a consent form detailing how the data would be anonymized and what information will be utilized in the research was required. The data management strategy was prepared to protect the data security (interview recordings, permission forms, and other files). These materials were approved by the Human Resource Ethics Committee (HREC) of Delft University of Technology. After getting the completed consent form, the interviews were held once approved.

The qualitative data gathered from the interview may exist in the form of transcripts, which must be condensed, classified, and inferences formed. The purpose of this analysis is to create a description of portfolio management methods and problems. These transcripts have also been uploaded to the 4TU research data repository. Simultaneously, it will be utilized to extract the

important factors for different teams in Riwal, as well as the inter-relationships between them. After identifying the factors, the following step is to develop links between them. Some of the correlations may be deduced from the qualitative analysis alone, while others will require more examination. A strong emphasis is to be laid on not only identifying the relationships but also on explaining them. Using this data, the most relevant factors must be identified and utilized to create a performance card or a scorecard for evaluating possibly new innovation activities.

The participants of the interview can be broadly classified into:

- Digital Demand and Supply (D):Candidates with expertise building digital innovation tools for the rental equipment market were considered. They are professionals in managing and implementing digital and IT initiatives for their firm from both a technical and a business standpoint.
- Marketing (M): These candidates help in the marketing and campaigning of their organization's digital tools. They have direct interaction with the clients or end users who utilize these technologies.
- Miscellaneous (X): These candidates are responsible for implementation of the solution in their respective regions from different teams.

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Code	Interview Expertise
D1	Digital Innovation Specialist in a rental equipment organization
D2	Manager of Digital Innovation in a rental equipment organization
D3	Regional IT and Digital Manager of a rental equipment organization
D4	QA Tester and Team Lead of development team of digital innovation in a rental equipment organization
M1	Marketing and Communications Advisor for a rental equipment organization
M2	Marketing Manager of rental equipment organization
M3	Marketing Intelligence Specialist for a rental equipment organization
D5	Group Manager for IT and Digital Innovation of a rental equipment organization
X1	Key Account Manager of a rental equipment organization

Table 2: Interviewee Code and Expertise

The relationship between different criteria can often be conflicting, which is significant since it might lead to potential trade-offs that must be made while developing the new process for assessing and validating new innovation activities. These trade-offs can be identified using both data sources and need to be investigated further. Once the appropriate solution has been selected and the evaluation parameters have been established, the solution should be evaluated using real-world use cases at Riwal. These use cases might be scheduled initiatives in the portfolio of the digital innovation team. The findings of the tests must be validated by Riwal's process experts. The entire research process has been illustrated in Figure 4

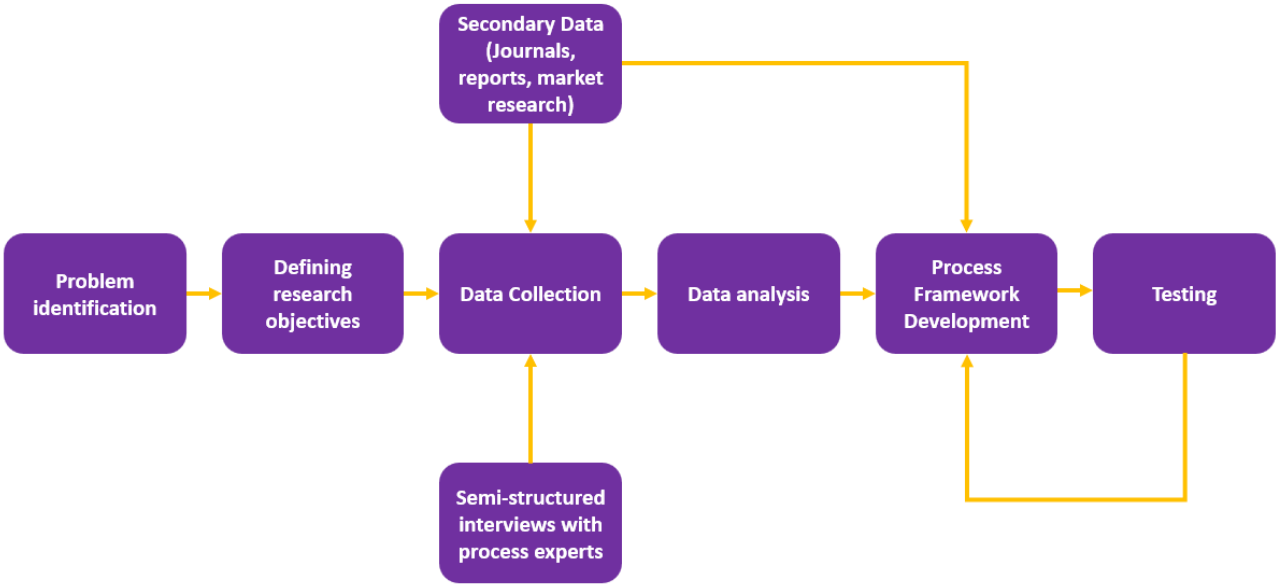

Figure 4: Research Flow Diagram

3 Literature Review

Innovation management has evolved in a variety of ways over the last few decades. Understanding how to effectively manage innovation is critical in an era where it is nearly an essential survival strategy for many organizations. The activities that take place at each phase of the development of innovation are referred to as innovation processes. The control and coordination of these innovative processes are referred to as innovation management (Ortt & der Duin, 2008). It is a specialized process that provides several organizational benefits such as maintaining a competitive edge, improving business performance, quick problem solving, improving productivity, and effectively utilizing company resources. Forming an innovation management strategy necessitates adhering to specific principles in order to guarantee that everyone, including stakeholders, executives, project managers, and team members, is on the same page. At the same time, putting these new ideas into action and seeing them through to completion necessitates a methodical approach (Mansinghka, 2021). Because this research concerns portfolio management of digital innovation, it was studied in three stages. The first phase entailed gaining knowledge of the potential for digital innovation and transformation in traditional and conservative businesses such as the equipment rental business. The subsequent stage involves a study on portfolio management and its significance. Finally, portfolio assessment and balancing methods were investigated.

3.1 Digital Innovation in Traditional Industries

The value chain activities of both manufacturing and service organizations have been altered by digital transformation. Businesses have begun to use digitalization in order to facilitate adaptable changes in operational processes, information systems, and society as a whole. Digitalization is also viewed as a source of organizational sustainability, allowing businesses to continually pursue internal efficiency and external opportunities to create value and expand market share (Rha & Lee, 2022). Digital technologies are not only being embraced and used inside particular sectors, but they are also redefining the nature of the sector by breaking traditional organizations and production network limits. Technology enables formerly internal activities to be conducted externally and, in certain situations, previously external operations to be performed within (Phillips & Warrian, 2019). Following the economic problems of the previous decade, conservative sectors learned an essential truism: it is becoming increasingly necessary to embrace digital in order to satisfy shifting customer expectations and respond to competitive threats (Burns, 2017). Companies are under pressure to figure out how digital fits into their business models and how to fully use its numerous opportunities. It is obvious that digital can act as a catalyst for new growth opportunities. Digital technology and the changes they have brought to businesses' daily lives have produced new economic prospects. They created new markets for new sorts of products and altered whole industries by dematerializing previously marketable commodities (Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2018). Nonetheless, many businesses have only just begun to consider how to implement a digital strategy.

Digital innovation and digital transformation are frequently used interchangeably. However, the question here is whether the two notions are synonymous or distinct - and while digital innovation and digital transformation are similar, they have significant distinctions (Drechsler, Gregory, Wagner, & Tumbas, 2020). While one can lead to the other due to a mutually causal link. However, digital innovation is typically a quick shift in reaction to an existing

(or new) challenge. Digital transformation is a protracted, deliberate process that results in substantial organizational change. Verhoef and Broekhuizen say digitization, digitalization, and digital transformation are the three stages of digital transformation. The coronavirus disease 2019 (COVID-19) pandemic has expedited the digital revolution (Verhoef et al., 2021). However, various challenges impede these businesses from fully realizing the benefits of digital transformation. These include inconsistent digital adoption across industries, digital skill gaps, and delayed technological advancement.

Despite the fact that several academic studies on digital transformation have recently been published, it should be noted that these studies are mostly directed at digital native firms, platform enterprises, and big organizations. The progress of digital transformation has been hindered by conventional sectors due to a lack of resources. As a result, empirical research on conservative companies' digital transition is lacking (Teng, Wu, & Yang, 2022). Organizations are increasingly under pressure to embrace digital technology to refresh and reinvent their business models. However, many organizations are failing to meet the challenge of responding to digital changes, resulting in a mismatch between market expectations and organizational capacity to adapt. Several studies on digital innovation have been conducted over many decades; yet, the research concerns are ambiguous, and how such studies fit together creates a potential for new knowledge. Furthermore, corporations are searching for innovative expertise about digital transformation to make available to practitioners in enterprises (Tahirkheli & Ajigini, 2022). Managers must view digital transformation as a value network issue rather than a value chain one. Digital technologies are gradually revolutionizing business-to-business (B2B) organizations, which now have access to a diverse set of digital systems that may manage their interactions with other network participants (Pagani & Pardo, 2017).

3.1.1 Advantages

Even in the most conventional industries, digital innovation is required. Not only would such a transition enhance operational operations, but it will also broaden the possible client base beyond what is geographically accessible or close to the organization. Organizations may benefit more by offering digital services and embedding IT solutions into their process structure. Companies must improve their business operations and increase customer satisfaction by leveraging digital technologies that link people, systems, and goods or make their services more effective and efficient. Digital technology enables businesses to integrate client requirements into product development or service delivery across whole process chains (Berawi et al., 2020). Given that businesses now operate in highly unpredictable and complicated settings, the capacity to adapt to a number of circumstances is critical. The better the ability of businesses to adapt to continuing digital transitions, the larger their potential to innovate and discover lasting competitive advantages ahead of the curve (Ferreira, Fernandes, & Ferreira, 2019). When businesses improve their ability to innovate by implementing digital processes, they contribute to improved performance and, as a result, increased market competitiveness.

Creating a digital platform to capitalize on an ecosystem's potential is acknowledged as a smart technique for optimizing innovation efforts in the digital realm. Platform-based ecosystems generate value through processes that involve a wide range of players, communities, actions, and commodities. These digital structures depict an innovation economy with fluid information processes, the stimulation of innovation and discovery, and smart solutions pushed via digital platforms (Isckia, de Reuver, & Lescop, 2018). Organizations must emphasize digital innovation in order to give them a tailored experience. This enables organizations to study client

purchasing behavior and preferences, which aids in customizing and enables them to provide individualized experiences to all customer groups (Malik, 2022). The advantages that industrial organizations and businesses obtain from digital innovation are numerous. They improve a company's back-end operations (resource monitoring), front-end operations (understanding customer procedures), and drastically affect customer behavior (by providing additional services to the customer) (Schroeder & Ziaee Bigdeli, 2018).

Companies that implement digital solutions will be able to address workers' rising desire for a better balance between work and personal life, as well as continuing personal and professional growth, owing to more flexible organizational structures. The prospects for innovation given by smart, connected items, as well as the proliferation of data generated by them, have the potential to fuel high economic development. If this occurs, new industries, services, and jobs will develop that will allow individuals to pursue their potential (Jadertrierveiler, Sell, & Santo, 2019),(Porter & Heppelmann, 2015). Businesses will evolve into extremely sophisticated, dynamic, and adaptable systems. As a result, they will need to empower employees by giving them control and decision-making authority. This will necessitate broad-based training as well as workplace approaches that foster continual professional learning and growth (Kagermann, Anderl, Gausemeier, Schuh, & Wahlster, 2013).

3.1.2 Challenges

The fast digitization of the globe and the professional sector is a tough condition to accept for many conventional, labor-intensive, and service-based businesses, but it is one they must face. Digital transformation is typically a lengthy and difficult process. It needs a clear strategic goal, open-minded personnel who are willing to adapt, and a sufficient number of digitally skilled individuals in the firm. Certain sectors, often those with a large number of physical assets, find it more challenging to make the digital transition than others (Hung, 2022).

Skills in designing, selling, and supporting digital innovation solutions are in great demand but in short supply. Companies must shift their focus from selling products to selling services, and from maintenance to product management. Companies who are currently in the midst of restructuring or have not yet began the change will encounter considerably tougher challenges (Porter & Heppelmann, 2014). Talented professionals, who are presently in short supply and may become much more so in the future, can be lured and motivated by benefits such as work flexibility, concierge services, sabbaticals, and free time to work on personal projects. Such practices are already popular in high-tech firms that employ the types of people that traditional businesses will increasingly require. Traditional companies will have to prioritize employee well-being in order to recruit highly qualified workers, which may increase their costs (Porter & Heppelmann, 2015).

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employee well-being in order to recruit highly qualified workers, which may increase their costs (Porter & Heppelmann, 2015).

A company's implementation of digital solutions necessitates a defined strategy and prioritization, as well as financial resources, leadership, and active engagement of all employees in the business. Too many businesses are focused on technology rather than the consumer because they lack the appropriate strategy. To capitalize on the promise of digitalization of business, established organizations must utilize strategy, culture, and leadership. To deploy digital innovation, transformational changes in strategy, leadership, and workplace structure are necessary. Rapid changes in the digital environment necessitate a reduction in strategic planning time and a transition to periodic planning, as well as cautious handling of extension of current data, a realization of the need for constant change, decentralized management, and so on (Kane, Palmer, Phillips, Kiron, & Buckley, 2015). The implementation of information technology will significantly alter the content of managerial functions in the organization, necessitating a rethinking of management strategies and tactics, as well as the investigation of new approaches to managing all types of resources, the most valuable of which is staff (Ivanova, Pulyaeva, Vlasenko, Gibadullin, & Sadriddinov, 2019).

3.2 Innovation Portfolio Management

There is an inherent demand to manage product and service innovations quickly and effectively as the number of digital service offerings grows and organizations undertake costly transitions in response to digitalization and servitization. The rapid and pervasive digitization of innovation processes and outcomes has resulted in the development of new ideas for innovation management. These ideas call into question basic assumptions about the distinctions between innovation and innovation agency, as well as the link between innovation processes and company performance (Ferreira et al., 2019). Firms must build convenient innovation strategies, regularly modify them to be able to adapt, and appropriately deploy strategically linked projects throughout their companies in order to thrive in increasingly dynamic and uncertain contexts. Today's strategy must adapt to the increasingly fluid nature of corporate environments. It must be adaptable enough to consistently adjust to changing external and internal situations, even if the goal of serving shareholders stays constant (McFarthing, 2021). The following are critical concerns for businesses to address in order to prosper in these highly dynamic and linked business processes:

- To achieve tangible results, strategy development and refinement must be integrated with execution on a continuous basis. Many businesses suffer not because they lack a viable strategy, but because they fail to transform it into appropriate initiatives and integrate it throughout the firm.
- Allocation of precious resources and capital across a variety of activities to maximize value while lowering risk for the overall organization. Due to resource restrictions, only 5-10% of project requirements can be fulfilled in practice.

Innovation portfolio management (IPM) is a dynamic decision-making process in which a company's current new product (and development) initiatives are regularly updated and amended. New projects are examined, selected, and prioritized throughout this process; current projects

may be expedited, canceled, or de-prioritized; and resources are allocated and reassigned to active projects. Uncertain and changing information, dynamic opportunities, various aims, and strategic considerations, project interconnectedness, and multiple decision makers and locations define the portfolio decision process (R. Cooper, Edgett, & Kleinschmidt, 2002). Portfolio management's relevance in effective product innovation has lately emerged as a key concept in the literature. It is significant due to the quick consumption of resources in the innovation process and the requirement for these to be controlled (Farrukh & Phaal, 2000). Its performance is strongly linked to the degree of understanding of its constraints and the quality of portfolio-level decisions, which may be handled utilizing multi-criteria decision-making (MCDM) methodologies, Portfolio Reviews Dominate strategy, Bubble diagrams, Portfolio maps, Scoring models, and other tools (R. Cooper et al., 2002), (Danesh, Ryan, & Abbasi, 2018).

Several factors affect the decision making process when assessing an innovation portfolio (Panesar & Markeset, 2008). They are listed as:

- Return on investments
- Availability of internal resources
- Innovation costs
- Risk of failure
- Availability of external competence

Portfolio mindset, agility, and focus have been identified as three characteristics that explain decision-making efficacy. Although the study is descriptive, the claims concerning the constructs are normative: Portfolio mindset suggests that choices are made based on "a thorough grasp of all of the projects in the portfolio and how each is connected with the firm's goal." A firm's decision-making agility indicates that it "can swiftly adjust its development emphasis to incorporate a new technology into its product line" (Kester, Griffin, Hultink, & Lauche, 2011). A generalized, comprehensive measuring framework described at the organizational level would offer a valuable foundation for managers to monitor and assess their innovation processes, identify constraints, and prescribe solutions. Based on different approaches the seven key innovation measurement areas proposed (Adams & John, 2006)

- Innovation strategy
- Knowledge management
- Project management
- Portfolio management
- Internal drivers
- Organization and structure
- External drivers

It is understood that these factors are subjective and that based on the requirements of the firm, the criteria with which projects need to be assessed can vary. However, the aim to create strategic alignment in the project portfolio raises two major difficulties (R. Cooper et al., 2002).

- **Strategic fit**: The first question is, are all of your initiatives in line with your company's strategy? For example, if you've identified specific technologies or markets as priority areas to focus on, do your initiatives fall inside these parameters — are they within or outside of them?
- **Spending breakdown**: The second question is, does your expenditure breakdown represent your strategic priorities? In short, are the areas where you are spending money completely compatible with your stated strategy?

The desire to constantly evaluate and optimize the portfolio is the characteristic of a portfolio management strategy. Portfolio management is described as the balanced planning and steering of a portfolio of activities with the goal of providing the most overall value to the firm. Using IT-based platforms can help to improve this procedure. The portfolio is routinely evaluated based on qualitative and quantitative factors.

3.2.1 Importance of Portfolio Management

Instead than focusing on specific innovation initiatives, IPM addresses the requirement for a comprehensive portfolio approach. Two well-known IPM studies highlight seven reasons why IPM is crucial (R. Cooper et al., 2002), (Killen, Hunt, & Kleinschmidt, 2006), (Lerch & Spieth, 2012). They are:

- To maintain a firm's competitive position
- To align projects with the firm's strategy
- To achieve focus and balance
- To efficiently allocate scarce resources
- To better communicate priorities within the company
- To provide greater objectivity in project selection

More frequent reviews lower project uncertainty, shorten feedback cycle times and allow for faster intervention if projects go poorly or other projects become more critical (McDonough III & Spital, 2003). When it comes to portfolio management, there are four basic denominators across businesses: four macro or high-level aims. Value Maximization: The objective here is to deploy resources in such a way that the value of your portfolio is maximized. Balance: The main goal here is to create a balanced portfolio - to attain a desirable balance of projects based on a variety of characteristics. Strategic Direction: The primary purpose here is to guarantee that, independent of other factors, the final portfolio of projects accurately reflects the business's strategy. The Right Number of Initiatives: to achieve a balance between the resources needed for "Go" projects and the resources available (R. Cooper et al., 2002).

The innovation portfolio also serves as a time management tool. It aids in determining the time necessary to accomplish a new venture. It may also be utilized to consider prospective possibilities that can be used as leverage in technology, markets, and goods or services. Portfolio management is also an excellent method for managing the success of innovation. Most of the time, the success of innovation is determined by dividing the total number of successfully realized innovation initiatives by the total number of begun projects. Portfolio management's primary purpose is to assess and optimize the success of innovation initiatives (Kester et al., 2011). Portfolio management is more than simply a management tool; it is also an organizational-wide activity. Businesses that make decisions with a portfolio perspective recognize the link between numerous products, current initiatives, market developments, and the organization's strategic direction.

3.2.2 Challenges associated with Portfolio Management

Despite the fact that the relevance of IPM has been recognized in business research and practice, most organizations are still dissatisfied with their IPM. Most businesses have far too many projects in the works due to the minimal resources available As a result, initiatives become stalled in the pipeline queue; they are taking an increasing amount of time to come to market; and crucial tasks inside projects - for example, conducting the preliminary work is ignored due to a shortage of personnel and time. This is known as a pipeline gridlock (R. Cooper et al., 2002). Failure to end poor projects in a timely manner is one of the reasons for too many development projects. Projects frequently appear promising at the outset, and so many are accepted. Some of these "approved projects" lose their shine over time, once they are in development or beyond, and when more information becomes available. However, the project has gained momentum: they take on "a life of their own" and continue to develop regardless of company politics; executive pressure; sunk cost reasoning; financial reasons (it's in the budget); emotion, and enthusiasm on the project team or management; or simply the lack of a kill mechanism in the process (*The Product Portfolio Management Benchmark Report ... - siemens software*, 2006). Portfolio managers are "typically preoccupied and overloaded with concerns such as project priority and the continual deployment of workers from several projects to tackle critical crises." As a result, human resources are stretched too thinly over too many initiatives, leaving every project, even the most vital, under-resourced.

According to studies, non-rational, social conduct influences structured innovation portfolio management decision-making processes. Political behavior in relation to innovation portfolio management is typically conceptualized as a series of self-serving actions, such as negotiation, bargaining, coalition building, and obtaining power, aimed at defending, maintaining, or advancing an actor's self-interest and power (Roeth, Spieth, & Lange, 2019). To cope with uncertain innovation activities, changing opportunities, goals, or strategic aspects, managers are likely to deviate from formal and rational procedures, making decisions through political means (Kester et al., 2011).

Because of a lack of cross-functional buy-in, the IPM process frequently leads to information overload and poor trustworthiness. Approximately two-thirds of businesses spend more time gathering, analyzing, and processing data for IPM than they do actually using it (Meifort, 2016). Portfolios of innovation projects are an essential predictor of a company's ability to manage innovation. Despite this, there is relatively little actual data on this association. As a result, this critical IPM field should be investigated more thoroughly. Future studies must also

examine whether IPM has an indirect influence on firm performance by influencing the success of innovation projects (Lerch & Spieth, 2012).

3.3 Innovation Portfolio Management Strategies

IPM's decision-making process must deal with unclear project information, changing environmental opportunities, and potentially competing for strategic aims. Because innovation ideas may originate from diverse departments within the company, the IPM process must account for their interdependence while also taking into consideration the distinctive responsibilities of numerous decision-makers and locations (Meifort, 2016). So far, there is little novel literature

on the topic of project (portfolio) management in the context of digital innovation. The first studies discussed and examined the nature and significance of digital innovation and project transformation in general, arguing that project control configurations must be rethought in the digital era (Barthel, Stark, & Hess, 2020). However, there is no consensus in the research on which practices are ideal for innovation management. After disaggregating the concept into component pieces, researchers adopt their partial viewpoints. As a result, the operationalization of measures is typically unique, owing more to the researcher's preferences and data restrictions than to the broader aims of synthesis or cumulation (Adams & John, 2006).

Decisions must be taken at least once during the project life cycle, regardless of how small or extensive the project is. The decision-making process for a given project or process can be split into four stages (Groeneveld, 2005):

(1) Framing - Are the decision objectives clear?
(2) Intelligence collection - Is the key information required available? Has missing data been identified? Are the risks identified and managed?
(3) Selection - Have all the range of options been identified? Is there a new perspective to solution?
(4) Feedback learning - Is there a formal procedure in place to transfer knowledge? Do teams learn from experience and from cross functional units?

The decision-making process for many large-scale projects determines the outcomes, which have a long-term impact on the effective operation of the company's innovative efforts. When confronted with such complicated judgments, multiple criteria decision-making techniques (MCDM) might be used (Peterkova & Franek, 2018). One of the most important methods to nail the process of decision-making and minimize misunderstanding is to set well-defined roles and duties. The word "RAPID" refers to one of the ways used by companies to clarify responsibilities in complicated decision-making processes (Recommend, Agree, Perform, Input, Decide). The RAPID technique is particularly useful when making complicated decisions with numerous working components and a large number of stakeholders (Dabo, 2021). Many innovation-based firms are now adopting agile processes to aid in effective decision-making as many organizations are opting for digitization (Zannier & Maurer, 2006). The strategic approach sees IPM as a crucial mechanism for putting company strategy goals into action, rather than just an optimization problem. Management connects strategy creation to implementation by assigning resources to specific projects based on a firm's strategy (Chao & Kavadias, 2013). The IPM strategy consists of two key elements - Portfolio balance and Portfolio Prioritization.

3.3.1 Portfolio Balance

When examining a portfolio, the desirable combination is a balanced portfolio, which is described as a collection of projects that allows a firm to meet the growth and profit objectives associated with its corporate strategy without exposing the organization to unwarranted risks (Mikkola, 2001). IPM is primarily concerned with having the best projects in a firm's portfolio at any given moment from an optimization standpoint. This comprises all steps related to updating the list of active projects in order to optimize overall portfolio value within the constraints of available resources. (Meifort, 2016). In order to balance a portfolio, certain steps and methods need to be incorporated. First, the initiatives and new technologies must be carefully chosen. Compliance with the company plan is of the utmost significance. This requirement must be stressed especially for long-term initiatives since they shape and symbolize the long-term strategy. A second phase is to balance the coverage of long-term and short-term innovative projects. A useful way to achieve such a "project mix" is to create three horizons: "short-term," "middle-term," and "long-term," which will aid in distinguishing and managing innovation initiatives across different time periods (Mikkola, 2001).

Several articles have recommended the usage of stage gate processes as a decision-making framework in technology-based and innovation-based firms (R. Cooper et al., 2002) (Conforto & Amaral, 2016). This procedure consists of stages separated by gates at which executives select whether or not to proceed to the next level. Typical stages include concept generation, assessment, design, development, testing, and implementation (Chao, Lichtendahl Jr., & Grushka-Cockayne, 2014). Tailored strategic selection criteria should be used to evaluate these technological initiatives at decision gates, which are secured by gatekeepers who ensure information is captured using a variety of scoring methodologies (R. Cooper et al., 2002).

Stage-Gate is a value-creating business process and risk model that is meant to convert an organization's finest new ideas into winning new products in a timely and profitable manner. When businesses adopt it, it fosters a culture of product innovation excellence, including product leadership, high-performance teams, customer and market focus, powerful solutions, responsibility, alignment, discipline, speed, and quality (Edgett, 2019). The Stage-Gate approach is founded on the premise that product innovation begins with ideas and culminates with a successful product launch. The Stage-Gate approach divides the sometimes complicated and chaotic process of developing an idea from conception to launch into smaller stages (where project activities are carried out) and gates (where business evaluations and Go/Kill choices are made). Stage-Gate combines pre-development efforts (customer-driven business reasoning and preliminary feasibility), development activities (technical, marketing, and operations), and commercialization activities (market launch and post-launch learning) into a single, strong business process (Karlstrom & Runeson, 2005). A typical stage gate process is illustrated in Figure 5

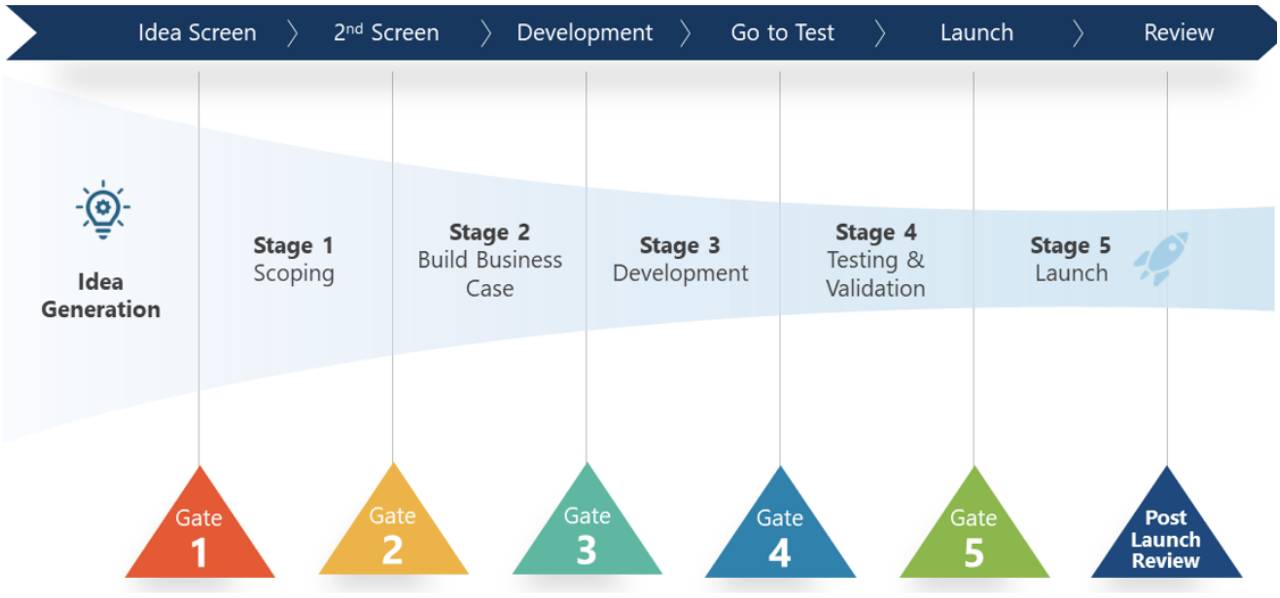

Figure 5: Typical Stage Gate Model

A project goes through a gate before to each stage, when a choice is taken whether or not to continue investing in the project (a Go/Kill decision). These serve as quality-control checkpoints with three goals: ensuring execution quality, evaluating strategic reasons, and approving the project plan and resources.
There are two fundamentally different approaches to integrating portfolio management tools into an organization's IPM process (R. Cooper et al., 2002).

1. The "Gates Dominate"
2. The "Portfolio Reviews Dominate"

The "Gates Dominate" method is best suited for larger corporations in mature industries with a relatively steady project portfolio. A robust gating process with integrated resource allocation mechanisms is likely appropriate here: there is simply no need to reprioritize the entire set of projects every few months; rather, the focus is primarily on in-depth evaluations of individual projects and making sound Go/Kill choices on each. Portfolio management is easily included into the process by slightly altering the gates (e.g., showing portfolio lists and charts at gates) and having multiple portfolio reviews yearly, but more as a course correction (Edgett & Cooper, 2020). The Gates Dominate approach is illustrated in Figure 6

The "Portfolio Reviews Dominate" strategy is most suited to fast-paced organizations in volatile markets, where portfolios are likely to be more dynamic: here, regular reprioritization of project portfolios is important, simply because things change so quickly in the marketplace. What was a good concept a few months ago is no longer so - the entire market has transformed! Using this system, all projects are auctioned off four times a year. Portfolio Reviews are the important decision meetings and are equivalent to an all-project, mass gate meeting in which all projects and all resources are on the table (Edgett & Cooper, 2020). The Portfolio Dominates approach is illustrated in Figure 7

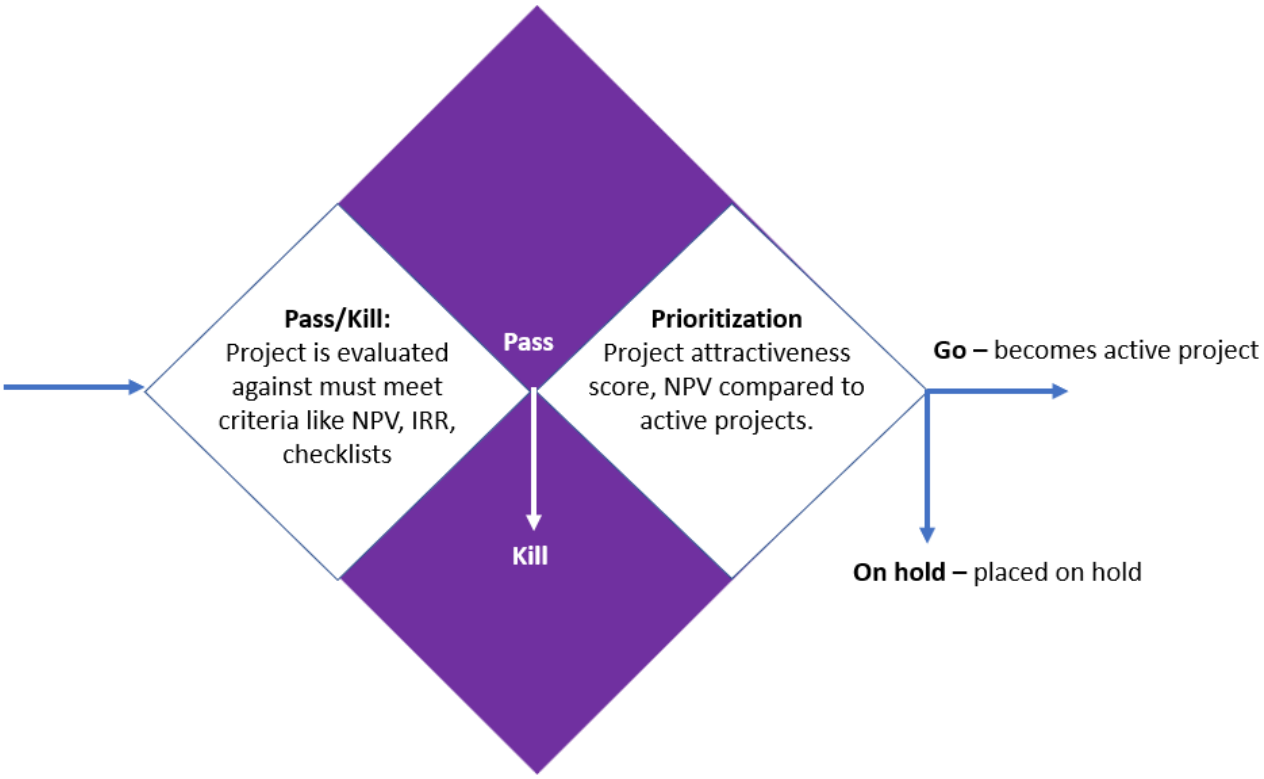

Figure 6: Gates Dominate Approach

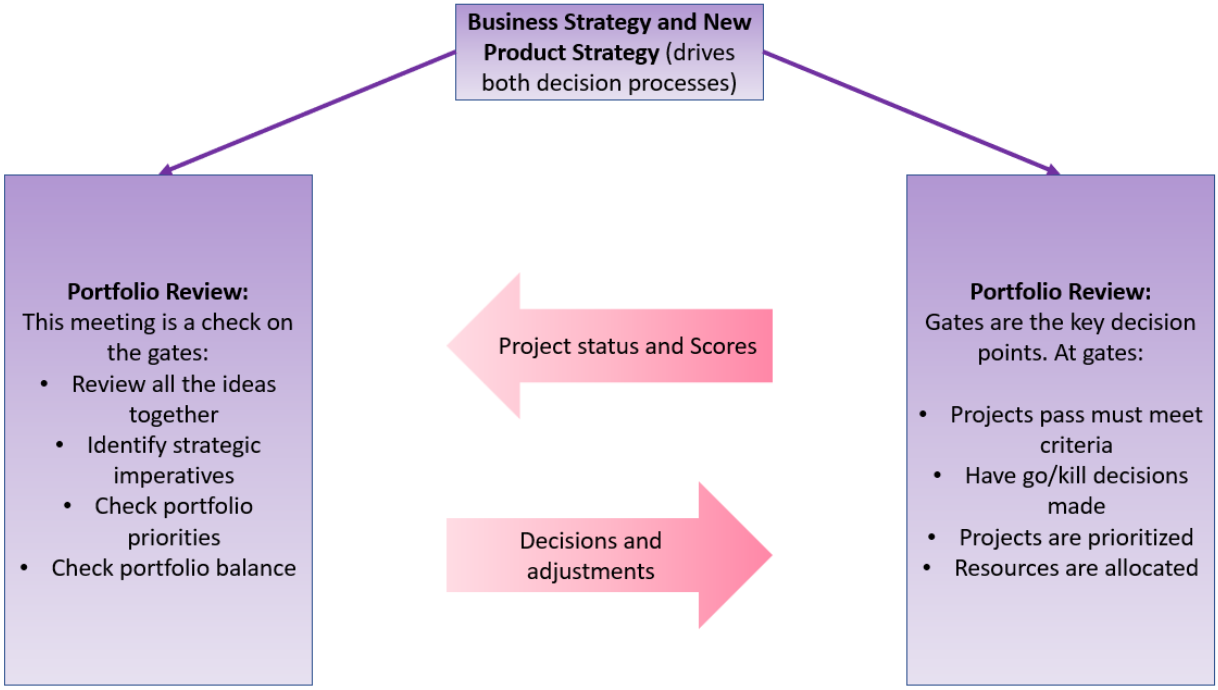

Figure 7: Portfolio Dominates Approach

It is critical to highlight that, in the face of current technology and digital transformation, businesses and sectors are attempting to be agile in order to adapt and respond to change.

The agile paradigm is growing beyond current applications such as IT-related projects and software development (Lee, 2020). Agile structures are presently being used on a broad scale by organizations, and agile structures are being embraced not just by IT, but also by business divisions (Gerster, Dremel, & Kelker, 2019). Therefore a possibility of an agile stage-gate hybrid model for IPM must be investigated. According to various studies, merging Stage-Gate models at the strategic level with the Agile approach Scrum at the execution level can provide performance increases and other benefits above even upgraded Stage-Gate processes (Sommer, Hedegaard, Dukovska-Popovska, & Steger-Jensen, 2015). Many people have discovered that applying Agile methodologies with traditional Stage-Gate procedures to form an Agile–Stage-Gate hybrid offers faster responsiveness to change and improved R&D productivity for high-uncertainty projects (R. G. Cooper & Sommer, 2020).

The traditional Stage-Gate approach is often linear, with the project team progressing from task to task and stage to stage in accordance with a stated time frame and project plan. The front-end homework duties in the Agile–Stage-Gate approach—the market, competitive, and customer analytics work, as well as the formulation of the business case and product definition—are quite similar to those in the standard gating model. However, the nature of these jobs differs; Agile iterations and customer testing give feedback that is looped into the analysis and definition as the business case is being built. As a result, initial assumptions regarding market acceptance, consumer value, and even production costs are frequently, early, and cheaply tested. Furthermore, go/kill choices can be made more often than in the traditional gating system—possibly at the conclusion of each cycle when findings are shown to management (R. G. Cooper & Sommer, 2020). As a result, Agile's iterative methodology enhances the data integrity required to make successful go/kill choices. It also aids in ensuring that product pipelines are pruned effectively, especially when iterations based on customer input are followed by demos to senior management.

Portfolio management faces new challenges as a result of the Agile–Stage-Gate technique. One issue is making investment decisions when the product description and project plan are flexible and continually changing. A second challenge is determining the appropriate measures to assess the portfolio's health and the development of its projects. Traditional progress measurements, such as percent on schedule, are made worthless by the Agile methods' continually changing project plans and timelines (R. G. Cooper & Sommer, 2020). Agile–Stage–Gate, on the other hand, provides answers to classic portfolio difficulties that provide immediate advantages. Approaching the hybrid system strategically, with a focus on both solutions and problems, can help smooth the way to acceptance.

3.4 Portfolio Prioritization

Portfolio management ensures that projects and programs are evaluated in order to prioritize resource allocation, and that portfolio management is compatible with and connected with corporate strategy. Financial indicators, technical criteria, risk-related criteria, resource-related criteria (human resources, equipment, etc.), contractual conditions criteria, and experience, as well as other qualitative criteria, are used to evaluate and prioritize portfolio components (Purnus & Bodea, 2014). Rather than taking into account several quantitative and qualitative factors, project prioritizing is typically based on a single profit-oriented criterion. The deterministic method is another drawback of current project prioritizing approaches. The majority of businesses create financial predictions based on deterministic estimates of project financial success (R. G. Cooper, Edgett, & Kleinschmidt, 2000).

The research shows varied outcomes in terms of approaches. According to Jugend, da Silva, Salgado, and Miguel (2016), Killen (2017), and Meifort (2016), increased use of procedures like scoring models, checklists, or network mapping promotes formalization or decision-making quality and hence increases portfolio performance. In contrast, Lerch and Spieth (2012) investigated the direct impact of technology utilization on IPM performance and discovered no significant influence. However, they discovered that specific strategies (for example, strategic buckets, team decision making, and checklists) have considerable influence on management perception and hence indirectly enhance IPM performance.

R. Cooper et al. (2002) lists a few approaches to prioritize projects in a portfolio:

1. **Strategic approaches:** For instance, after determining the business's strategy, money is allocated across several sorts of initiatives and into various envelopes or buckets. After that, projects are graded or rated within buckets. This strategy is used by 64.8 percent of firms and is the leading option for 26.6 percent of enterprises.

2. **Bubble diagrams or portfolio maps:** The bubble diagram (BC) is a graphing tool used in project portfolio management to help make decisions. The diagram is a variation on the standard x-y plot in which a circle or an ellipse replaces the single points and more information is supplied by modifying the shape, size, and color. Portfolio maps are used by 40.6 percent of organizations, although just 8.3 percent utilize it as their primary technique. The risk vs reward map is the most prominent, although there are several bubble diagram variations.

3. **Scoring Models:** A scoring model is a mechanism for assigning a monetary value to one or more projects or activities. Governance teams can use scoring models to assess proposed projects based on variables such as risk level, cost, and possible financial rewards. The scaled ratings are summed to provide a Project Attractiveness Score, which is used to determine project selection and/or ranking decisions. These models are employed by 37.9% of organizations; in 18.3%, this is the primary decision approach. Aristodemou, Shaw and Tietze, provide an extensive list of criteria that can be used to develop a scoring methodology for a project with the stage gate decision making process (Aristodemou, Tietze, & Shaw, 2020).

4. **Checklists:** A series of Yes/No questions are used to evaluate projects. To advance, each project must obtain either all Yes replies or a specific amount of Yes answers. The amount of Yes votes is utilized to determine Go/Kill and/or ranking (prioritization) choices. Only 17.5 percent of organizations employ check lists, and this is the dominating strategy in only 2.7 percent of cases.

After evaluating and prioritizing projects, a rank-ordered list of 'priority one' projects is generated, which will be used to make decisions at the Portfolio Committee meeting. Although the criterion scores are used to define priorities in the portfolio tool, the technique for selecting priorities is yet unknown. Individual project analysis and challenges are frequently based on subjective grounds and are not systematically evaluated. In this manner, the ultimate Go or No-Go decision places much too much weight on political issues. Although it is difficult to identify priorities with the aid of portfolio tools, the ultimate choice in the Portfolio Committee is not based on predefined criteria (Gleisberg, Zondag, & Chaudron, 2008).

3.5 Reflection

This section summarizes and reflects on what was discovered during the literature review. It also explains what further needs to be discovered in the future phases of exploration.

Recently, a number of publications on digital transformation and digitalization have been released; it should be emphasized that these studies mostly target large corporations, platform companies, and digital native firms. This implies that there are limited journals on digitalization processes in traditional industries. However, there are a number of blogs and business websites that offer advice on various techniques that these conventional organizations could apply. The majority of them were left out of the study since they are unreliable sources of information and are difficult to verify. Several advantages and challenges of digital innovation were highlighted in different literature which can aid in verifying information found in the next steps of this research.

IPM is a crucial process for any innovation-based organization. While there is no defined process or an optimum solution for IPM, it is inferred that IPM is dynamic and contextual to an organization and its innovation activities. There are several solutions/tools for IPM. As per Adams and John (2006), most strategies are dependent on the researcher's inclination, and the operationalization of measurements connected to IPM is often unique. Most literature reviewed for this study cites the work of Robert G Cooper and Scott Edgett who recommend using different portfolio evaluation strategies combined with a stage-gate model. Stage-gate models not only help in IPM but also help in evaluating and validating the potential of innovative activities at each gate (R. Cooper et al., 2002). There are different types of Stage-gate models used in practice by organizations and are tweaked based on the organization's requirements. Since digital innovation and digital transformation-related activities are increasingly adopting agile approaches, Agile-Stage-Gate hybrid models are gaining prominence for IPM.

There is hardly any literature on IPM and digital transformation in the rental equipment industry. Therefore, more study has to be done to better understand the market. The next phase of this study will involve market research and analysis to identify trends and barriers in this industry. In this study, the aim is to investigate a suitable model for the IPM of the digital innovation activities at Riwal. The "Gates Dominate" approach seems to fit well with the organization's culture. Since Riwal incorporates continuous improvement in its way of working and practices continuous improvement, the possibility of an agile-stage-gate hybrid model needs to be considered. Since there is limited research for agile-stage-gate hybrid models for service-based industries, further research of primary and secondary data collection needs to be carried out to evaluate its potential for this study.

4 Market and Stakeholder Analysis

The current and future dynamics of the rental equipment industry is described in this chapter. Various trends and barriers to digital innovation in the equipment rental sector are examined using various market research reports and data from various rental equipment firms. Following the market research, a stakeholder analysis was carried out to better understand the motivations of various stakeholders in the rental equipment sector in order to manage expectations while creating or prioritizing projects.In this chapter we answer the question ***'What are the current trends in digital innovation for the rental equipment industry?'***

With the assistance of Riwal Holding Group, this project entails developing a process to evaluate the digital IPM of an equipment rental firm. Understanding the marketplaces in which a business works is critical to understanding its innovation initiatives. This is done to identify various industry trends and barriers that may influence the firm's activities.

Rental of equipment is a relatively new industry that began in Anglo-Saxon nations. It began in the United Kingdom after World War I and has since grown into a multi-billion-euro corporation that provides a wide range of construction and industrial equipment to clients worldwide. There are approximately 17,000 equipment rental businesses in Europe alone, and the sector is rapidly expanding in other parts of the world, including the Middle East, Latin America, and Asia (International Rental News, 2020). The industry has evolved from primarily family-owned small companies to the formation of several worldwide conglomerates. The procurement of new operational equipment has proven to be highly expensive, significantly increasing a company's overall capital expenditure. The option of renting equipment has provided greater flexibility and significantly lowered equipment charges. The global equipment rental business has expanded steadily over the previous decade, with a revenue of 87.5 billion US dollars in 2019. The European equipment rental market generated around 25.2 billion euros in revenue (Placek, 2022).

The coronavirus pandemic had a significant impact on the European equipment rental business in 2020, resulting in a 10.4% market drop. According to a 2020 study, half of European representatives of equipment rental companies reported a decrease of up to 50%, with 19% indicating a 30 to 50% decline in their operations. This is due to a decline in business induced by lockdown measures enforced to prevent the spread of the COVID-19 virus (Placek, 2022). Because the market is defined by the existence of multiple global and regional competitors, companies are attempting to gain a competitive advantage through joint ventures, partnerships, and the development of new products with sophisticated technology.

The Equipment Rental market is divided into several sections, including product types, applications, end users, and locations. The market for renting equipment extends well beyond construction equipment. The rental market serves a wide range of clients and businesses in addition to the construction industry, including gardening and landscaping, municipal and forestry services, the event industry, and individual clients. Specialized machines and equipment are offered based on the consumer segment. Additionally, the equipment that is available for rental is frequently supplemented by other services. There are different types of equipment that are rented out, such as construction machines and equipment, power and temperature control equipment, Powered access, forklifts, telehandlers, modular and sanitary space equipment, falsework, formwork, and groundworks. There is a lot of dispute in the rental market over whether it is better to be a product specialist or a generalist rental organization. Generalists,

by definition, have a diverse product portfolio and, as a result, the potential capacity to balance demand across many business sectors. Specialists, on the other hand, concentrate on a certain area of interest or range/type of machine. Generalist operations have a propensity to default to a 'lowest common denominator' sales strategy, allowing smaller specialists to capture potentially profitable market segments. Specialists are being pushed to take a far more targeted and sophisticated approach to customer acquisition and business growth (Appleton, 2012). Riwal Holding Group specializes in services linked to aerial work platforms including telehandlers, scissor lifts, and similar devices, making them specialists in providing solutions for working at heights.

4.1 Industry Trends and Barriers

Companies have many reasons for choosing to rent rather than buy their equipment, and the preferred forms of rental equipment have varied throughout time. When deciding whether to purchase or rent, there are five points to consider:

- Current financial circumstances
- The expense of owning vs the cost of renting
- Project duration or work frequency
- Equipment availability and utilization
- Inventory control and fleet management

Many companies anticipate that existing and forthcoming infrastructure laws will boost growth in construction equipment sales and create construction employment, hence raising demand in the equipment rental market (Galaszewski, 2021). Many economists and business executives anticipate that as a result of the pandemic problem as well as prolonged recession, demand for rental services and equipment leasing will skyrocket. In addition to this cost issue, cyclical and economic variations in the construction sector make it difficult for enterprises to make full use of the equipment they acquire and achieve the most value possible, especially when the equipment is idle in a sluggish business condition (Fact.MR, n.d.). Aside from being far less expensive than purchasing, leasing equipment provides a more sustainable approach that contributes to the circular economy.

According to the European Rental Association (ERA) Casebook, forward-thinking enterprises have already begun to make their operations more effective, enhance their customer service, and offer new solutions for their clients as a result of digitization. E-platforms for leasing equipment is progressively gaining traction in this industry. Customers have been impacted by data-driven decision-making, which is why leased machines are now connected with IoT sensors to monitor various characteristics of the machine such as energy usage, CO2 emissions, active and inactive hours of operation, GPS, and so on. Because of the cost-effectiveness and flexibility, training machine operators with virtual reality (VR) and augmented reality (AR) is increasingly becoming popular. Customers are also using VR and AR to plan and visualize the sort of equipment that is most suited to their task (Davis, 2021).

The primary barrier or challenge is that the industry is still doing things the old-fashioned way, by phoning rental businesses and asking for availability and price bids to hire machinery.

The issue for many businesses is change. "If it ain't broke, don't repair it" is still a prevalent viewpoint (Toppers, 2018). The challenges that the rental industry faces while embarking on the digital transformation are:

- Legacy systems
- Lack of collaboration
- Lack of data analysis

When it comes to rethinking their platform methods, many rental equipment firms become bogged down in expenses and complexity. As a result, they are unable to consider how innovation and improvements to company operations might boost their long-term income stream (Toppers, 2018). A robust change management culture is critical for the success of any firm. Any new project or implementation plan that lacks a change strategy is certain to fail. An effective change management approach include designing a project by determining the fundamental causes of problems - as well as developing connections with all stakeholders and personnel (Prosci, n.d.). Because the rental equipment market is conservative and resistant to change, businesses frequently fail to implement an effective change management approach. Another problem impeding innovation in the rental equipment sector is the variation in market maturity levels between regions. This makes it extremely difficult for global or multi-national players to operate centralized across several locations.

4.2 Stakeholder Analysis

The Stakeholder Analysis helps in understanding the different stakeholders involved in the company and to what extent they can affect its operations. A stakeholder analysis assures that everyone who is impacted will be taken into account, even though the interests of certain stakeholders may conflict with those of other affected stakeholders (Ackermann, Fran, Eden, & Colin, 2011). Different companies, industries, and teams will perform different stakeholder analysis activities. In this study, stakeholder analysis was carried out while keeping in mind how customers in the rental equipment market are being affected by digitalization and digital innovation.
The identified stakeholders for a rental equipment firm operating in multiple regions are:

1. **Suppliers:** Suppliers are businesses that sell a wide range of equipment that the rental equipment firm may buy, lease, and brand as its own. Suppliers provide machines along with data related to the machines such as specifications, instructions and operations. They collaborate not only with the firm but also with its competitors are they operate in B2B channels.

2. **Customers:** Customers are companies or individuals that rent the machines from the organization for their tasks. They are the ones making demands and using digital tools provided by the organization.

3. **Regional Offices:** These are offices through which the company operates in multiple locations and countries. As mentioned earlier, the maturity of local markets vary from region to region and the employees in these offices cater to the needs of the local market. They also promote and help in the implementation of digital solutions in their regions.

4. **IT and development teams:** These teams are directly responsible for ideation, planning, development and deployment of various digital solutions within and outside the organization. They also train customers to use these solutions as well as are actively involved in service and maintenance of the digital tools.

5. **Organization:** The organization is responsible for approving projects related to digital innovation as well as promotion of the solution to its customers. Any initiative carried out by different teams directly affect the organization and its revenue.

6. **Competitors:** Competitors act as secondary stakeholders. If a solution developed by the organization proves to be disruptive or radical, it affects the operations of the competitors and vice versa. They do not directly influence the innovation activities of the firm but act as motivators for the firm to expand and innovate.

A stakeholder Power-Interest Grid was developed to map the priorities of different stakeholders involved. The Power-Interest Grid is shown in Figure 8. The stakeholders have been grouped into four categories.

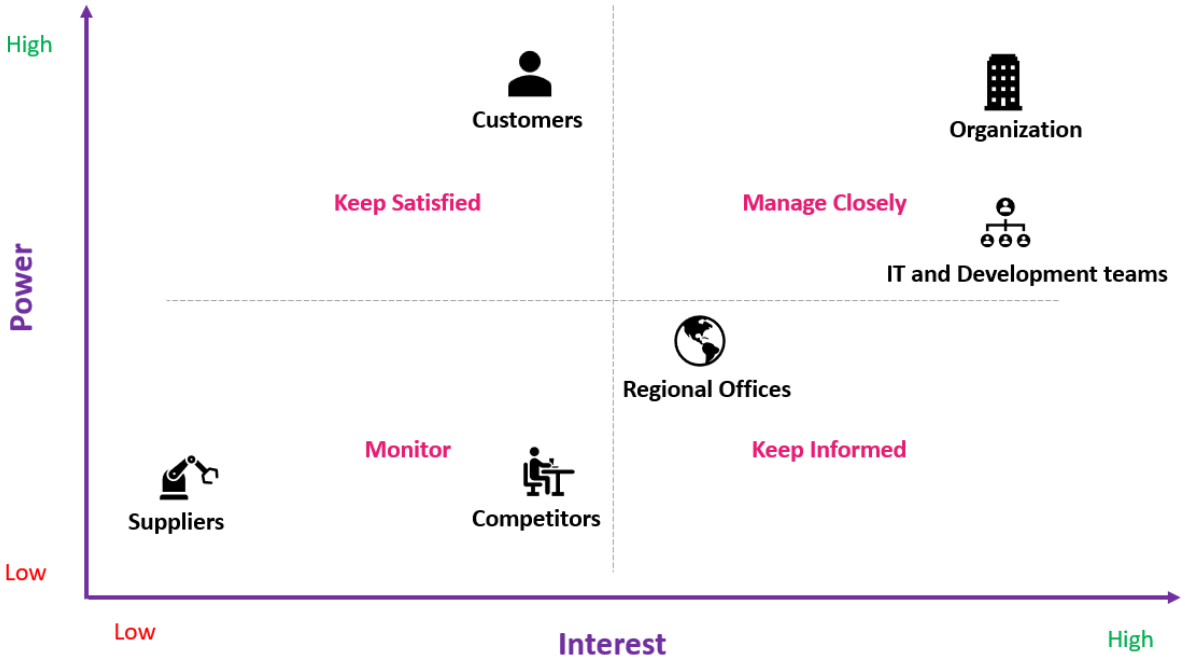

Figure 8: Power-Interest grid of stakeholders involved

1. **High power, high interest:** The business should put a high priority on ensuring the satisfaction of these key stakeholders with the project's outcomes. These stakeholders must be **closely managed** since they have a significant impact on the project and its execution. The organization is very interested in creating digital innovation tools since it gives it a competitive advantage and serves as a unique selling point to draw in new customers. Due to its responsibility for making the decision to accept or reject a project, the organization also has significant power. IT and development teams within the organization also have high interests as their objectives are in-line with that of the organization. However, they have slightly lower power than the organization (management) as they develop the projects approved by the organization.

2. **High power, low interest:** Companies should make an effort to **keep these people satisfied** because of their impact on the organization. However, if the company over-communicate with them, they may lose their interest since they haven't demonstrated a strong interest in the conceptualization and development of the project. Customers of the rental equipment company have high power as they are the end users of the digital products offered to them. They have a high impact on the success of the project. However, their interest in the development might be low as they may not see the necessity of the solution due to their conservative nature of operation. This however is region specific and is changing with advancements in technology.

3. **Low power, high interest:** To ensure that they are not having issues with the project, businesses must **keep these individuals informed** and communicate with them frequently. Regional offices have the power to promote and implement the solutions developed by the company in different regions. However, since they operate with interest of the local market, some regional offices may not been too interested with using or incorporating these solutions.

4. **Low power, low interest:** These stakeholders need to be **monitored** from time to time. Suppliers are providing aid to the company with their daily operations by providing machinery. The organization needs to monitor the supplier from time to time to see if there are new products that are offered by the supplier. The innovation within the company is not directly influenced or controlled by competitors. They could, however, serve as a catalyst for the business to grow and develop. Therefore, the organization must monitor its competitors actions every now and then. To stay on top of the curve, competitors are also paying close attention to the company's innovation with some interest.

5 Interview Analysis

This chapter describes the findings of the interviews conducted with the experts of RHG. The purpose of a semi-structured interview was to gather information about the factors and challenges of promoting digital innovation activities in the rental equipment business. In addition, interviews were conducted to define key criteria necessary for IT-related initiatives in the rental equipment industry. A generic interview schedule is established, with planned, rather more broadly phrased questions. It was feasible to deviate from the preset questions during the interviews. This allows the researcher to ask follow-up questions if the candidate expressed something intriguing or was not completely understood. Interviews provide more specific information, which is frequently the aim of qualitative research (Ritchie, Lewis, Nicholls, & Ormston, 2013). The interview candidates were experts from various departments of a rental equipment organization, RHG. The list of anonymized candidates can be found in Table 2. In this chapter, the sub-research questions ***'What are the factors that promote the development of new digital tools in an international rental equipment organization?'*** and ***'What are the different challenges that impact the prioritization of innovation processes of the digital innovation team in an international rental equipment organization?'*** are investigated.

5.1 Interview Protocol

The applicants for the interview were predefined owing to the nature of the investigation and were listed using internal data of Riwal Holding Group. Prior to the interviews, research questions are defined, as shown in Appendix B. During the interviews, there is time for discussion and additional questions to better grasp the several perspectives on the factors and problems of encouraging digital innovation activities. The purpose of the interviews is to:

1. Validate the findings from literature studies.
2. Validate the findings from market analysis.
3. Find different factors that aid in the development of digital innovation tools in the rental equipment business.
4. Find different challenges that act as barriers to foster digital innovation activities in the rental equipment business.
5. Identify different criteria that are essential to evaluate IT and digital projects for an organization operating in the rental equipment industry.

Overall, most of the interviews had the same structure with differences in questions related to area of expertise. The structure used was as follows:

1. **Explanation of the research topic:** The interviewee was informed about the research subject. The project title, aim and objective of the research, and purpose for the interview were all given. Before the interview, informed consent was obtained to record the sessions for research purposes and to prepare transcripts for analysis.

2. **General questions related to digital innovation activities:** The first few questions in the interview involved questions related to digital innovation in Riwal, the organization's response to these innovation and the customer's perception of these solutions. The purpose of these questions is to gain an understanding of the organization's initiatives as well as its position in relation to the rest of the industry.

3. **Interviewee's expertise on digital innovation activities through their fields:** The interviewees have extremely specialized sets of knowledge, which is mirrored in their employment titles at Riwal. Some participants are related to the development of the solution (supply), while others are skilled at brainstorming and executing the solution (demand). A number of the participants have local and global marketing and communication experience. As a result, during the interview, questions about their efforts in connection to these digital projects were posed.

4. **Questions related to the portfolio and project management within the organization:** Because the primary goal of this research is to design a process for portfolio management in a rental equipment business, participants were questioned about the organization's structure, project management methods, and current portfolio management and prioritizing procedures. Additional questions were provided to interview participants based on their responses to these questions in order to better grasp certain aspects.

5. **Additional insights:** Based on the questions thus far, the experts were asked to provide additional insights into the process design as well as some points that might add value to this research.

ATLAS.ti was used to code the interviews in order to discover general themes for various challenges and factors. Open coding and Axial coding were used to determine factors and challenges. A typical first stage in the analysis of the interview data is open coding. Create "codes" to label the separate portions of the data by using open coding. In qualitative research, links are made between codes as they are categorized using axial coding. The codes used and categorized can be found in Appendix A

5.2 Factors

Moving away from viewing IT as a commodity or as a piece of machinery to keep the business operating is a specific issue for many businesses. Traditional governance and coordination protocols are rarely followed by digital innovations, which originate from the options available in a digital environment. Organizations must promote a culture of information, sharing, and continuous learning in order to remain competitive in a digital economy. Several factors contribute to the success of digital innovation activities inside a business. Based on the interview analysis, the following factors were discovered to influence the growth of digital initiatives in Riwal for which this research was conducted. Therefore this section answers the research question the sub-research questions ***'What are the factors that promote the development of new digital tools in an international rental equipment organization?'***. However, it should be emphasized that there may be a number of additional variables that contribute to the expansion of digital innovation in the rental equipment industry.

5.2.1 Digital Transformation

The need to provide an outstanding customer experience is driving considerable investment in digital transformation, which is anticipated to grow in the coming years. Digital transformation may help organizations enhance engagement across all stages of the customer experience and achieve the degree of satisfaction that today's customers have started to expect.

Literature research and market analyses confirm that the industry is undergoing a steady transition, with radical innovations such as marketplaces and online portals to hire and off-hire rental machines. During the interview, D1 discussed on the shift observed in the industry.

"Yeah, I think it's all becoming more digitized. Like I think everyone sees that we are always in hardware and physical equipment. But you see that we are like improving and innovating and innovating your services and it is really focused on digitization."

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Digital transformation Gr - 5	X		X					X	

Table 3: Groundedness of code - Digital Transformation

Customers in the industry embrace this transformation as well, because digital solutions may give better data insight, further improving the customer experience. Because of the Covid-19 pandemic protocols, most individuals were working from home, making it harder for them to hire machinery through usual ways (phone calls and meetings). This necessitated the development of e-platforms that would connect enterprises and other businesses to equipment rental providers as rapidly as possible from anywhere and at any time. M1 says

"Depending a bit on the customer, of course, but I think I think they perceive it as a very welcome addition to the services that we provide. I think they recognize it partly from their b2c experience with other companies and it actually helps to carry out their jobs while it makes it easier for them."

5.2.2 Project Management

Project management strategies in the rental equipment business enable businesses to easily analyze their fleet management performance, estimate their potential for improvement, and track their progress through several stages of fleet management competency. Several areas are addressed by project management in the digitization of the rental equipment business.It is described as the required practices that an organization applies for various projects that are carried out to adopt or enhance digital innovation activities in the organization in this study. Riwal Holding Group's digital innovation team uses Agile methodology to manage various projects connected to their online portal and mobile application.

Seven of the nine participants believe that project management practices are good for the growth and expansion of digital innovation and IT tools within and outside the company.The interviewees are satisfied that employing agile methodology and project management solutions such as JIRA has given the team more control over their projects and helped them reach defined objectives while also fostering incremental innovation inside the organization. D5 explains how agile methods are used in the organization.

Scrum is our methodology to practice this agile.So we have a scrum board. We use JIRA Agile Scrum board. To schedule our sprints, we usually have biweekly sprints. So we are practicing the scrum, scrum methodology wherein we have sprint planning, sprint review, sprint retrospective, etc

and

So now we are much more agile, and have tried to completely move away from the conventional way of software delivery from a waterfall methodology to more agile way of working. So we deliver incrementally. So it's a multitude of things that definitely helped us to improve.

Candidate D1 feels that introducing structure to initiatives, as well as validating decisions made throughout the process with stakeholders, is critical in digital innovation department of RHG. Apart from identifying suitable methodologies for different projects, interviewees also feel that setting a road map for the planned projects is essential. Candidate D3 is of the opinion that,

"To be honest, the fundamental grounds on which these kinds of products or solutions are built on and the process part around it is not rock solid yet. From an IT perspective, or digital perspective we need to go back to the drawing table again."

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Project Management Gr - 12	X	X	X		X	X	X	X	

Table 4: Groundedness of code - Project Management

5.2.3 Competitive Edge

Competitive edge or competitive advantage refers to variables that enable a firm to produce goods or services better or at a lower cost than competitors. A range of factors, including cost structure, branding, product quality, distribution network, intellectual property, and customer service, are attributed to competitive edge. In a traditional, conservative business such as the equipment rental, innovation in processes and services add to the competitive advantage of an organization. the literature in section 3 also emphasizes that competitive advantages drive organizations towards innovation. 5 out of the 9 candidates have acknowledged that competitive advantage acts as a catalyst for innovation activities in the business.

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Competitive edge Gr - 9	X	X	X	X		X			

Table 5: Groundedness of code - Competitive Edge

D3 says

"You also need to implement digital services on top of your machines, so that you create digital disruptors, innovative ideas, where clients see the benefits, why they choose for us for rental and not for the competitor."

M2 indicates the need to have advantage over competition.

"I think that we've been in a luxurious position for the last 30 years, 20 years. Work came to us, people came to us and competition was alright. But what we see in the last couple of three to five years is that there's more competition and there's less work coming in. Our profit margins are on the pressure. So we need to be more innovative, we need to be more customer centric."

In the same sense, D1 claims that clients are expecting digital solutions as more and more rivals embrace them.

"You see, especially regarding digital innovation, like the more mature countries are really not even asking for it, they are basically demanding it - like we need this. Because otherwise our competition has this. And we need to keep up the pace. Otherwise, we don't have any USP unique selling point to provide to our customers."

5.2.4 Industry Trends

Machines are becoming more intelligent, and more organizations are automating operations. Although in in its infancy, the Internet of Things provides a peek of a quickly approaching future in which connected equipment might provide new revenue streams for rental players.

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Industry trends Gr - 7	X	X	X						

Table 6: Groundedness of code - Industry trends

D2 comments on the utilization of machine data as

"Yeah, so I think the most important thing in our in our business, in our industry is machine data and like to ensure that right people get the right solution. It is important to get this data and it's also scalable for your whole fleet or for the whole business and if it's there, then there's a high demand from our customer."

Regulations pertaining to electrification, health and safety, sustainability, and emissions are causing customers to keep track of new requirements and reconsider the composition of their fleets. Customers may now explore new paths for data monetization, fuel management, equipment tracking, up time-based agreements, and more attributable to digital transformation in construction. All of these need stable software platforms to collect and monitor data. D1 states,

"And I think, it really can be really innovative industry, which is also always highly dependent on regulation. So you see that once new legislation comes in, or the need to,for example, need to reduce their carbon emissions by 50% in a certain year, that really accelerates the innovation process for the demand for those companies and that we need to serve that that needs. So we need to think ahead already and see what's going to happen in the coming years. And try to adapt our services as well."

5.2.5 Team Structure

Having a cross-functional team in place can help a company's digital transformation journey go more smoothly. A team comprised of individuals from all departments will be able to develop the finest plans and solutions since they can give viewpoints from all aspects of an organization.

The technology is built and maintained by cross-functional teams, which comprise software engineers, product managers, user experience designers, business analysts, and so on. They must be totally committed to the efforts and have a vision that is reflected in their regular tasks. M3 is of the feeling that

"I think is really important that we as a marketing team and a communication team also influence the internal organization making sure that they are moving at the same pace as the rest of the organization. And therefore also embracing the new innovations that we have, and also embracing the maybe new interdisciplinary way of working or embracing the solutions that we can provide to our customers so that they can eventually sell it to the customers. And that's that's really important."

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Team Structure ' Gr - 7	X	X	X		X			X	

Table 7: Groundedness of code - Team Structure

Bringing more structure as well as clearly defining responsibilities within teams also aid in developing good projects. D5 agrees with this and states

"So now that there's a clear separation of the demand and supply, plus a dedicated team for the innovation, that is going that is giving a little more structure and insight into the way we are developing applications, even though we are following the best industry standards and practices as a software development team."

Good leadership to lead the teams and have a grip on the activities related to digital innovation is equally important within the team. These are the individuals in charge of carrying out the roadmap. They are in charge of technology deployment and process transformation. The technology implementation leaders are responsible for the actual installation of the technology. The implementation leaders concentrate on the change management that will occur as a result of the transition.

"I think we, if you if you don't have leadership in this, it's really hard to make progress. And the the way people understand your vision or the intelligence of an innovation is that's really complex."

Good communication among teams is also required. While working on a project or discussing new initiatives, teams must function seamlessly and on the same page.

"Important factors is discussion, I will definitely say it's a discussion part, for example, we have a team of five or six, discussion is a main important part, for example, they come with a point, we discuss about it, and we decide how are we going to implement it? And how what is the solution that the company going to get after implementing it? So I would say discussion is the main factor"

5.2.6 Support and Motivation

Digital innovation requires the acquisition of new technological skills. However, this is insufficient. Employees must be encouraged to put their abilities to use in order to generate new

prospects. They require a digital mindset, which is a combination of beliefs and actions that enable people and organizations to chart a successful path in an increasingly technologically intensive environment (Neeley & Leonardi, 2022).
The firm must also be open to nurture ideas and encourage the employees to develop solutions or bring in changes. D5 states

"It's very often, in the sense that they are we always had a had a chance to raise our voices, we always given a chance to contribute in all possible ways. So it's been very often so they are very open to these kinds of affiliations and opinions."

When employees are motivated to build competence, they completely buy into the transformation strategy and believe they can help make it a reality. D4 who was motivated and encouraged by the company says

"Because this company is always welcoming everything whatever this is, the discussion is always open to everyone, there is nothing like a higher level lower level discussion is open to everyone. They can read I suppose, and I can go with my points, they will we will discuss about it. And if it is good for the company, we will implement it that too, they will have a reply to everything"

Organizations should ensure that employees have access to technology as well as the skills and motivation to use it. D4 adds

"Luckily, they have already provided to us a platform to learn, we already have the club condition with the Udemy. Every developers and every team members have access to, they can keep on updating their knowledge, they can improvise their knowledge, they can learn new thing, they can keep updating about the new technologies that coming up. So that's why at the beginning, I said company itself is an open arm"

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Support and Motivation Gr - 8				X	X	X		X	X

Table 8: Groundedness of code - Support and Motivation

5.2.7 Training

Offering learning and development programs that not only teach existing employees but also attract in-demand new talent is one of the keys to driving the people part of digital transformation.

The pace of development in the digital world is accelerating and is not anticipated to halt anytime soon. Employees across departments need access to tools and platforms that will enable them to regularly top up their abilities and acquire new proficiencies, allowing them to remain relevant and up to date in an extremely competitive marketplace.

While incorporating new processes in the way of operations, it is imperative that employees are trained in the new way of working. D5 mentions on how they were trained in agile methodologies.

"We had some training sessions in I should say, related to the agile scrum methodology. For the end, we do have a certified scrum master within our team."

When there is a shift in the way the organization engages its clients and does business, training is also required. M3's opinion is

"I think what we need is a mindset shift from looking internally and improving the internal processes to more focus on the on the customers and say, Okay, what can we do in order to make it easier and better for our customers? I think that's that's a major mindset shift. Where a lot of training comes in."

Customers must also be instructed and informed on how to use the new tools. Given that the equipment rental industry is highly conservative and resistant to change, efforts must be made to get customers to adopt the solutions offered for them. M1 observed that

"I think it's always education, because if you have a great product, but you never tell your customer about this product, so of course they wouldn't use it. So I think you need to also spend a lot of efforts to explain what what is your product is and why they need to use it. And only like that, they will start"

D5 cautions, however, that focusing on the creation of novel solutions might lead to a loss of touch with the customer's degree of experience with new innovation. D5 concurs with M1 and adds that educating various individuals in different places fosters ownership of the solution.

" Like you see that you you, once you're developing these, these solutions, you will also be coming into a, into a tunnel vision, and you think that everyone immediately understands what this tool is about, they first need to be an expert. So you need to provide training. What we do now is we come over to the countries to sit down with them, do full day training, and do a lot of follow up sessions afterwards. So they really start owning the tool, we also push them to give the training to other people, so they become the full expert. And it works pretty well."

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Training Gr - 8	X	X		X	X	X		X	

Table 9: Groundedness of code - Training

5.3 Challenges

Managing digital innovation and organizational transformation continually presents new challenges. It raises strategic issues for both incumbents and new digital disruptors.When companies engage in digital transformation, they report on a series of significant strategic problems. While the makeup of difficulties under each challenge may fluctuate, it appears that numerous concerns are shared among firms in the same industry. This section answers the question ***'What are the different challenges that impact the prioritization of innovation processes of the digital innovation team in an international rental equipment organization?'***.

5.3.1 Resource Constraints

Organizations can be viewed as an interconnected web of people, practices, tools, and other resources all working together to create digital solutions through digital innovation. Employees who actively and intensively support the innovation process by providing resources such as specialized knowledge, organizational influence, communication skills, and networking competencies to overcome barriers such as administrative hurdles are one of the main resources that act as promoters. Catalysts are employees who play a passive role in innovation processes by assisting, facilitating, and encouraging their colleagues' innovativeness (Ciriello et al., 2018).

Four of the nine participants believe that resource constraints impact innocation activities negatively. Resource constraints at Riwal is mostly the lack of people. D1 remarks on the absence of promoters within the company, which slows the rate of innovation.

"So we can try to be disruptive and really innovative. But you see that we don't have the people to carry our ideas, because we always have to we, we develop the idea at HQ, but we have to roll it out in the countries themselves, and then the people there have to be the owner of the solution. But we don't have really the, the people at the moment to, to carry those tools with with the knowledge and the expertise to train other people."

M2 also believes that lack of resources in the form of catalysts also slow down the implementation of the innovations.

"IT/ data team, which is also understaffed, and we need them quite frequently. And I must say that marketing has not, I mean, we're, I'm not gonna say we're understaffed, but we could do with more people. So we, we can't really do as much as we would like to do"

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Resource Constraint Gr - 8	X	X				X	X		

Table 10: Groundedness of code - Resource Constraints

Organizations must first address the problem of lack of resources before accepting new projects in order to meet the expected pace of development. Until the demand of people is met, existing projects need to be prioritized before new projects are proposed.

5.3.2 Organization Structure

Companies frequently mandate digital transformation (or any other popular change theory) without relating it to their teams' day-to-day experiences. This is especially true if organizational structures and decision-making procedures are not modified to accommodate the new objective. Such disconnects between fact and rhetoric can make employees uninspired (if not outright opposed) to change (Wensveen, 2019).The following are some of the most common organizational barriers to digital transformation: a lack of management insight, knowledge, and experience, a lack of leadership skills, a lack of organizational agility, rewards and incentives that are not aligned with digital transformation, an unclear monitoring and rewarding system, a lack of employee support and collaboration, and employee resistance to change (Mirkovic, Lukic, Lazarevic, & Vojinovic, 2019).

	D1	D2	D3	D4	D5	M1	M2	M3	X1
Organization Structure Gr - 10	X	X	X		X	X		X	

Table 11: Groundedness of code - Organisation Structure

Riwal has a decentralized organizational structure. This is due to the corporation's status as a holding company. Each functioning country has its own set of operations and activities. M1 states

"The thing that Riwal, it's not really a centralized company, but really, I would say, more decentralized. So basically, it means that on the country level, you need to have people support to, let's say, promote some projects or innovations or things. So if you don't have a support from country manager, or let's say, managing global, then of course, it's very difficult."

D3 on the other hand also claims that the processes in the organization that aid the development of the projects also need to be in place.

"But to be honest, the fundamental grounds where these kinds of products are built on, and also the organization and process part around it is not solid rocket yet. So if you want to implement number two, number three, number four, we don't have the authorization for change and the platform for change."

Organizations must be more open and receptive to change. Teams need to be given a more centralized role in decision making as well as promoting digital solutions. M3 is of the feeling

" I think the position of the marketing team and the Riwal is not where per say should be, I think, what what you see in more innovative companies and bigger innovative companies, which are actually very profitable that marketing is more as a more centralized role. And I feel sometimes Riwal marketing is more of a supporting role and with this you'll see that it's more reactive."

The fundamental characteristics that businesses must accomplish and perfect are speed and cooperation. As a result, there needs to be fewer hierarchical levels and more collaboration among staff. Because traditional bureaucratic management models are rigid and have little room for change in terms of current market dynamics, new types of organizational structure must be established.

5.3.3 Interdependencies

The bulk of digital innovation is comprised of many teams dedicated to planning, developing, delivering, and operating the digital services on which the business and its consumers rely. Multiple tools are frequently used by these teams to monitor and manage anything from application and infrastructure performance to user experience, registrations, and income. A cross-functional team is made up of employees from many divisions within a corporation. Typically, this type of team works toward the same objective despite differences in knowledge, experience, and positions. This means that different departments within the organization are interdependent on one another. An example is provided by M2 in their interview.

"although I am aware that this ecosystem that we are striving to develop, of course, also interlinked with other departments. And there is another project, I believe on the way to create that

that web app or that ecosystem, as we call it, to link all the systems, so there must be some form of communication."

	D1	D2	D3	D4	D5	M1	M2	M3	X1
Interdependencies Gr - 10		X	X	X			X		

Table 12: Groundedness of code - Interdependencies

Collaboration and information sharing is at the heart of digital innovation and digital transformation. D2 agrees

" So, yeah, innovation means for me, sharing data, be transparent and be flexible. So it's not only for me the outside, but also the inside, it's really important to be innovative."

D2 also adds

"So you you need to find you need to connect people, the people that that that understand each other and have the same goal. And then try to create a platform that's also given the stability to do kinds of initiatives. So that's, that's I, I see it as a combination."

Communication between teams is very important for collaboration. This leads to smoother operations and faster results. If the interdependencies are not clearly communicated, the progress of projects may not be visible as per D3,

"So if you can, maybe more implement the time to market with small, minimal viable products, you can easily adopt on that change from the outside, that is very important, and internally and externally that they see the progress not always are we very good, especially also not in IT, we are not very good communicators."

Cross-disciplinary team cooperation was a challenge at Riwal, which was partially attributable to the organizational structure. This problem is being addressed, however, through improvements and adjustments in the communication channels between the teams.

5.3.4 Lack of Expertise

Employees require digital skills in order to deal with new technologies and stay up with rapid technological changes. While there is a great demand for digital talents, there is a limited supply (Feijao, Flanagan, Van Stolk, & Gunashekar, 2021). Workforces may not always have the necessary skills to manage digital innovation, and firms frequently struggle to locate qualified candidates for digital jobs. This is reflected when an organization shifts in the way it operates and offers solutions. M2 finds this transition challenging as

" That's also I think that's also has to do with the fact that we develop stuff in house, and we are not an IT company, or an AWP those companies. But sometimes we pretend that we're an IT company. And I'm not, you know, it's not an attack on anybody in the IT department. But let's not pretend that we are an IT company, and we have all the expertise. There's a lot of extra companies build apps that could have probably done an equal or maybe a better job."

D1 also says that it adds constraints to the existing resources when the team lacks expertise to understand the scope of the solution.

"The main thing now is the lack of people and the lack of the right expertise to do these kinds of things. Like you see that you you, once you're developing these, these solutions, you will also be coming into a, into a tunnel vision, and you think that everyone immediately understands what this tool is about, they first need to be an expert."

	D1	D2	D3	D4	D5	M1	M2	M3	X1
Lack of expertise Gr - 8	X	X	X		X		X		

Table 13: Groundedness of code - Lack of expertise

Businesses must upskill their employees in order to remain competitive. Employees will feel valued and driven if they are taught new marketable skills. Workers who are equipped with cutting-edge talents know that they will have the ability to grow within the business and take their career to the next level. Company-sponsored education is also used to attract, recruit, and retain talent. Riwal currently has taken a stepping stone in this direction by providing licenses to an online training platform called Udemy.

5.3.5 Portfolio Priority and Balance

By balancing project portfolios, businesses can optimize project benefits while minimizing total project risks. To achieve these objectives, executives must assess and balance the portfolio. Companies frequently struggle to maintain balanced portfolios that are aligned with corporate goals. Industries like the equipment rental business are focused on day to day operations. D3 states that it is a challenge to strategically align the present ongoing project with the future strategic goals.

" It is because our market and equipment is very day to day we they order it today and they want to have it yesterday. Sometimes our management and we self are also act like that. So priority, setting strategic goals for the future is always mid and long term. So the ultimate goal, the focus is always on day to day. So how do you balance between helping the operation now? And also setting some things in movement for mid and long term? That's the challenge here within Riwal at the moment."

	D1	D2	D3	D4	D5	M1	M2	M3	X1
Portfolio Balance and Prioritiy Gr - 6	X		X		X		X	X	

Table 14: Groundedness of code - Portfolio Balance and Prioritization

Along with balancing the project portfolio, it is also important to set the right priorities for the right projects. When it comes to digital projects, there is typically a big list of ideas, many of which appear innovative and beneficial to stakeholders. Without the time or resources to address them all at once, it is necessary to prioritize tasks. Effective prioritizing may help IT teams manage their time more effectively, allow all team members to work more efficiently, and guarantee that the most essential projects are tackled first. Traditional methods frequently fail to fulfill expectations because there are so many different stakeholders involved, all of whom seem to have opposing views on how projects should be handled. Trying to prioritize tasks effectively may be tedious and inefficient.

When asked about the portfolio evaluation techniques used in their organization, D1 said

"I would say it's really comes from a gut feeling. But just really, I really don't like it.But that's the way it goes. Now. Just to be honest, it's by sometimes being decided by business folks. So just raise your hand if you think this should be done first.But there's no qualitative data check, like or research.No validation with customers, or as we are we did in the past on those are I at least I did it. But that's not enough, I guess that was really focused on the tool I'm developing, but it should be more on the strategic level."

D5 feels that the current approach used by the organization is not accurate and says

"But still, if you particularly talk about my role as a customer facing big the biggest customer facing solution that we are currently handling and developing, maintaining and developing, I still think that the priorities of features that we are given to this particular platform is not so aggressive, in the sense that the our priorities are listed a little off."

This challenge can be overcome by using specific project prioritizing strategies and developing a prioritization system, which can make this process more efficient and effective.

5.3.6 Response to Change

Businesses must handle the transformation brought about by digitization. To do this, they must alter their management techniques. However, as with any major upheaval in a conservative business, developing a systematic change management strategy can be challenging.Employees may be hesitant to "experiment with new concepts." It might be difficult to get a budget because decision makers may not see the need to alter processes that appear to be working. Even if they do, getting the proper people involved to the amount that they need to be can be difficult. In today's digital transformation scenario, the capacity to confront and adapt to change inside an organization is becoming a vital component of survival for many firms. This is especially relevant in the rental equipment business as per D1.

But you see that if you are developing digital innovation on these new way new kind of methodologies?For, for, in, within and rental in a company who are more traditional, I think in, in, in general, for, for for the whole industry. It's a really big you. I really underestimated how much of an change that is for these kind of people like they. They have no idea what it is like, how to deal with it.

	D1	**D2**	**D3**	**D4**	**D5**	**M1**	**M2**	**M3**	**X1**
Response to change Gr - 5	X		X				X		

Table 15: Groundedness of code - Response to change

The problem of coping with change in this industry can be due to multiple reasons. D3 is of the opinion that technological advances are difficult to implement when the employees are of an older age group.

"And the nice example is that within Denmark, we have around 18 People that works with the rental desk for more than 20 years with an old programme. And they can all they can do the rental order blindness, they get the new change of applications. And it's cost very, very long

time to unlearn what they did, and learn what they need to do. In UK, they have very young, small team, they are all under the 30. They didn't work with the previous application suite, and they now are back in business in five weeks, and they don't make mistakes.""

But D3 also adds that

"it's not a does not only do with age, it's also what, what did they do before and how long? And are they capable of adopting that change? So it's a little bit both ways."

Two aspects can help to overcome resistance to change: communication and training. Employees are better equipped to accept change if the need for it is communicated and the amount of change is transparent. Similarly, educating personnel in the new method or with the new technology will facilitate the transition.

5.3.7 Maturity of the Industry

Industry areas such as technology, media, and finance have been more adaptive to digitalization than others, while traditional industries have been reluctant to catch up. However, given the necessity for automation and digitization, many industries have accelerated their digital transformation. However, the acceptance of these digital solutions are still slow even though there might be a demand as per D2

"And I see that the industry is not ready for the demand and doesn't have the infrastructure to, to move together with, with this kind of, of opportunities."

Acceptance of innovation also vary from country to country. As per M1

"I think if you talk about Riwal, we could take as a good example, My Riwal platform, we can see that in some countries, the number of users is quite high. And at the same time, in some countries, it's very low."

This is also observed during the interview with D1

"The second thing is that you need to need to keep into account that you are dealing with different kinds of markets, different kinds of situations.....So we we always try to come up with a universal solution for other countries. But that's actually not really possible. There is no one size fits all, although we try to make that. So we need to, we need to extract more data from the country so we can give them other solutions "

D1 adds

"So and but for other countries that internally it's really a struggle, because they are more traditional and more conservative. Yeah, they will have really traditional way of business.They say yeah, but you can come over. But we already we already telling you we're not going to really market it, we're not going to push this, this system to our to our customer, we're not, we're not going to put a lot of resources in it."

One way to tackle this problem would be to create a mandate for all the regions. But given that the industry is still conservative, efforts need to be made by the industry as a whole to accept change and innovation.

	D1	D2	D3	D4	D5	M1	M2	M3	X1
Maturity of Industry Gr - 7	X	X	X			X		X	

Table 16: Groundedness of code - Maturity of Industry

6 Process Design for Digital Innovation Portfolio Management

In this chapter, the designed process for evaluating a rental equipment company's digital IPM has been illustrated and explained. In this chapter, the sub-research question being addressed is ***'What models can be used to design a process to balance and prioritize the project portfolio of digital innovation in the international rental equipment organization?'*** The methodologies and steps used to create the design have been discussed. The Gates-Dominate approach for portfolio management has been chosen as the design's foundation template. The phases of the process design have also been explained. Portfolio management is completed when projects are assigned to teams for analysis and development. Because most digital innovation initiatives are software-oriented, agile methodology has been proposed for implementation by project teams.

As stated in section 3.2, pipeline gridlock afflicts many business portfolios. Simply said, there are too many projects and not enough resources to execute them properly. Pipeline gridlock not only affects a company's project portfolio but it may also impact the business operations of the company as resources are occupied in several projects. In Interview Analysis section, from several interviews it can be noted that part of the problem that creates a pipeline gridlock is the lack of resources. The failure to distribute resources properly is an other element that affects the project portfolio of the rental equipment business. Portfolio evaluation processes are also to blame, as is senior management's unwillingness to reduce the number of active projects—to say "no" to some worthy ventures. Projects are assessed, and decisions are taken, but some crucial implications are frequently overlooked.

Implementing the Stage-Gate Model to assist make better judgments while dealing with portfolio management is one technique to evaluate an organization's project portfolio. As seen in theory, Stages may be considered as a set of activities. Every stage consists of many tasks that must be finished before moving on to the following phase. There are gates in between each of these stages. Gates serve as milestones or "decision points." The probability of success can be increased by the firm's ability to focus on the correct projects or revisit unsuccessful ones via the usage of various stages and gates. As seen in section 3.2, a typical stage-gate model has 5 stages and 5 gates. The stage-gate model in literature used for this study is for new product development. However, Portfolio management activities in the rental equipment organization can broadly be divided into three phases - Scoping projects, portfolio evaluation and project development. Therefore, the five-stage, five-gate model has been modified to fit the phases of IPM in the rental equipment organization. Using a three-stage, three-gate model we can incorporate a portfolio assessment phase in the gates of the model. Beyond current applications like IT-related projects and software development, the agile paradigm is evolving. Organizations are currently using agile frameworks widely, and core businesses are adopting them along with IT divisions. Implementing agile methods offers a chance for continuous improvement for a business (like equipment rental) that is new to IT and digital transformation because digital solutions are by their very nature IT-based solutions. We can also include agile methods in the stage-gate model when the projects move to a development phase. Thus making the overall process an **Agile-Stage-Gate hybrid** as seen in section 3.3.1.

As shown in Figure 9, Following the discovery stage, ideas are first vetted. Individuals inside an organization, business partners or consumers, rivals, or inspirations from other industries

can all generate ideas in the equipment rental industry. The first gate filters out all the non-viable ideas. The concepts that pass through Gate 1 are then in the Scoping stage. The component of project planning that involves identifying and recording a list of precise project goals, deliverables, activities, expenses, and deadlines is known as the project scope. It outlines the project's boundaries as well as its additional value or relevance. Gate 2 is concerned with screening and filtering these ideas. Ideas that have been approved move on to the second stage, which is focused on developing a business case. A business case is prepared in the early phases of a project and includes the project's why, what, how, and who. This entails verifying the project with the project's target groups. Projects in the scope of digital innovation might have an impact on customers, various departments, or countries connected with Riwal, or Riwal as a whole. As a result, a project proposal must be validated using various business validation techniques to see whether it is essential or offers value to the target audience. At the end of this stage, the project is sent to gate 3 in which a portfolio review is conducted. All digital innovation-related ideas must reach the end of the second stage to become a part of the digital innovation project portfolio.

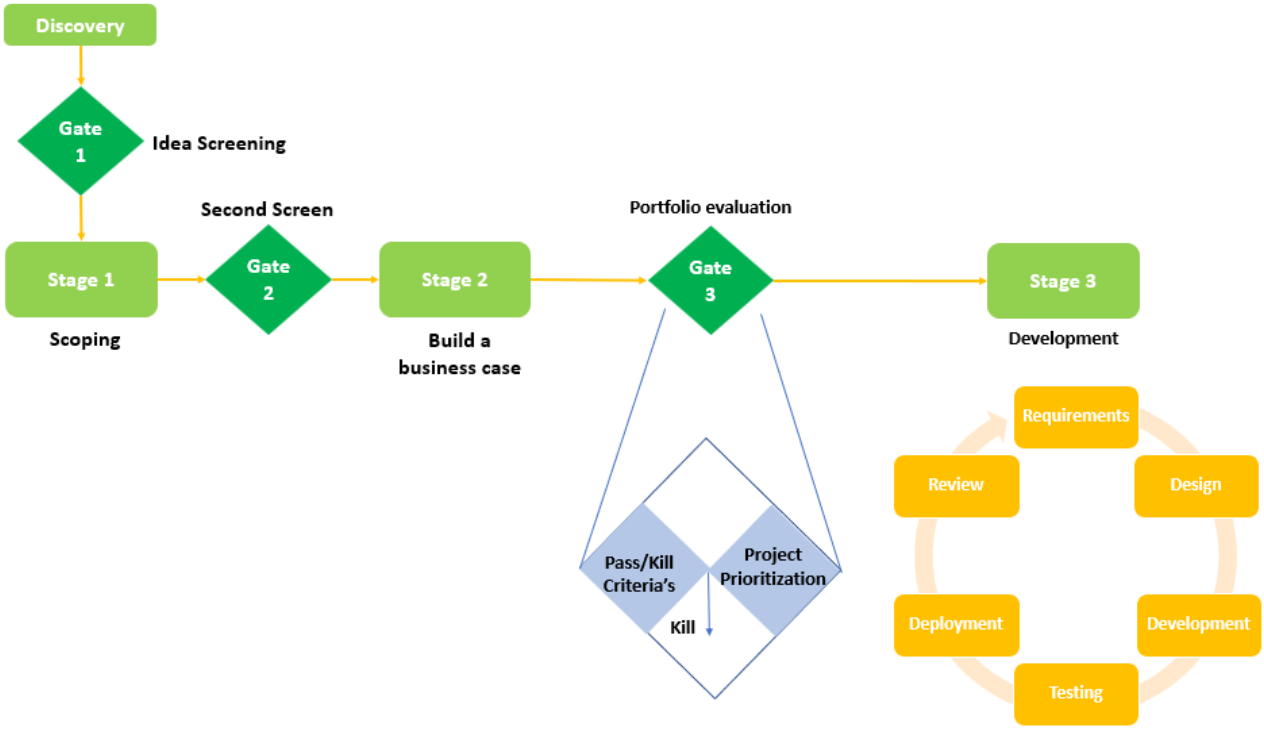

Figure 9: Process design for digital innovation project portfolio management

Because the rental equipment sector frequently has decentralized organizational structures, it is important that managers or executives from various teams meet to discuss projects in the organization's portfolio. The major objective of this is to discuss the availability of resources throughout the company for project execution. The Gates Dominate approach is a suitable model since it is a solid gating procedure with integrated resource allocation strategies. The emphasis is on doing thorough assessments of individual projects and making good Go/Kill judgments on each. Portfolio management is simply added to the process by slightly altering the gates (e.g., showing portfolio lists and charts at gates) and having numerous portfolio reviews per year, which include a course correction for future reviews. The managers, experts,

and executives form a portfolio governance team in the portfolio review meetings. a portfolio governance team in portfolio review meetings makes Go/Kill judgments on individual projects at the gates. This is carried out in gate 3 of the model. An explanation of the 'Gates Dominate Approach' and the prioritization methods can be found in section 6.1 and section 6.2.

At the end of gate 3, a list of projects in priority order is acquired. High-priority projects are moved to the development stage. The development team, often known as the digital supply team, uses agile approaches to generate solutions at this phase. Due to interdependencies, teams assisting in the development of solutions will use an agile-hybrid method to communicate with one another regarding the project or task progress. This has been further explained in detail in section 6.5.

6.1 Gates Dominate Approach

As mentioned above, gate 3 of the stage gate model uses the Gates Dominate approach for portfolio management and evaluation. This approach helps in early expectation definition, which reduces mistakes and improves success rates through early error identification and shorter cycle times. This is seen in section 3.3.1. The gate in this approach is divided into two halves. One for project screening and the other for project evaluation. The Gates Dominate approach model has been modified using the inputs from the interviews from Appendix B. The base model for the process of IPM in a rental equipment company is illustrated in Figure 6 has been used and modified as shown in Figure 10

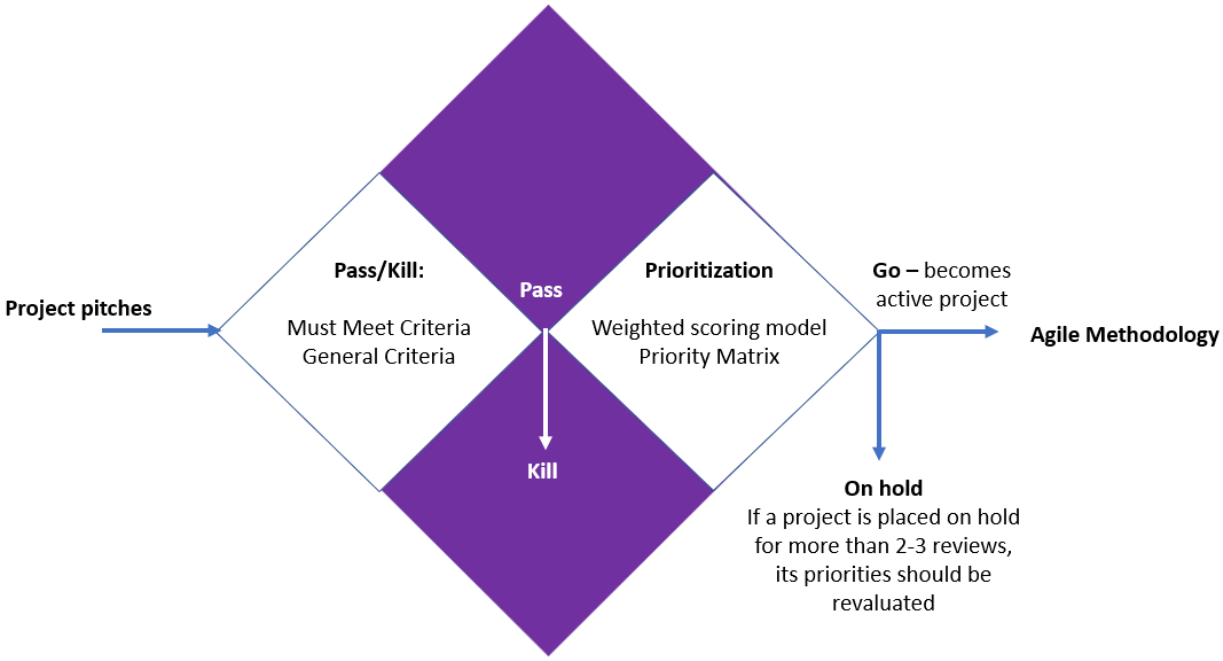

Figure 10: Gates Dominate approach for RHG

The portfolio evaluation is divided into two components, as shown in the model. The first component of a gate is a pass-or-kill decision, in which individual projects are examined using a checklist for certain criteria. If the requirements are satisfied, the project moves forward. If

it does not match the conditions, the project is canceled. The portfolio evaluation is divided into two components, as shown in the model. The first component of a gate is a pass-or-kill decision, in which individual projects are examined using a checklist for certain criteria. If the requirements are satisfied, the project moves forward. If it does not match the conditions, the project is canceled. The portfolio governance team must scrutinize two sets of criteria. The 'Must meet criterion,' which is a non-negotiable checklist, is one type. The second is a general criterion that is up for negotiation. Negotiable criteria promote project revisions and discussions. The criteria are listed and explained in sections 6.1.1 and 6.1.2.

The second part of the gate meeting is spent prioritizing the project under consideration over all other proposals. In reality, this entails deciding whether all projects should become active or put on hold. To evaluate the relative desirability of the project under discussion to the other active and on Hold projects, a rank-ordered list of projects is provided. Projects in the portfolio prioritization phase are ranked based on Project Attractiveness Score obtained from a weighted scoring model. The scoring model is used by the portfolio governance team to score the project based on various criteria explained in section 6.4. This is suitable for new projects. Projects in the context of digital innovation, on the other hand, might be incremental improvements added to a solution or additional features to an existing solution. Given that various features and updates are created by the same teams with the same resources, this list must also be prioritized. However, comparing incremental innovation to disruptive or radical innovation brought forth by new initiatives during assessment would not yield reliable outcomes. As a result, a different approach to prioritizing these minor additions is required. To do so, a simple priority matrix has been considered. This has been explained in section 6.3.

Since project prioritizing and portfolio management in this manner are new to Riwal, it is critical to enhancing the process based on feedback received after prioritization. Teams working on the project may learn that some project priorities were incorrect in practice and should make note of this. This must be conveyed to the portfolio governance team so that the evaluation procedure may be adjusted and improvements are made during future project assessments. A detailed, step-by-step illustration of the 'Gates Dominate Approach' part of the process has been shown in Figure 11.

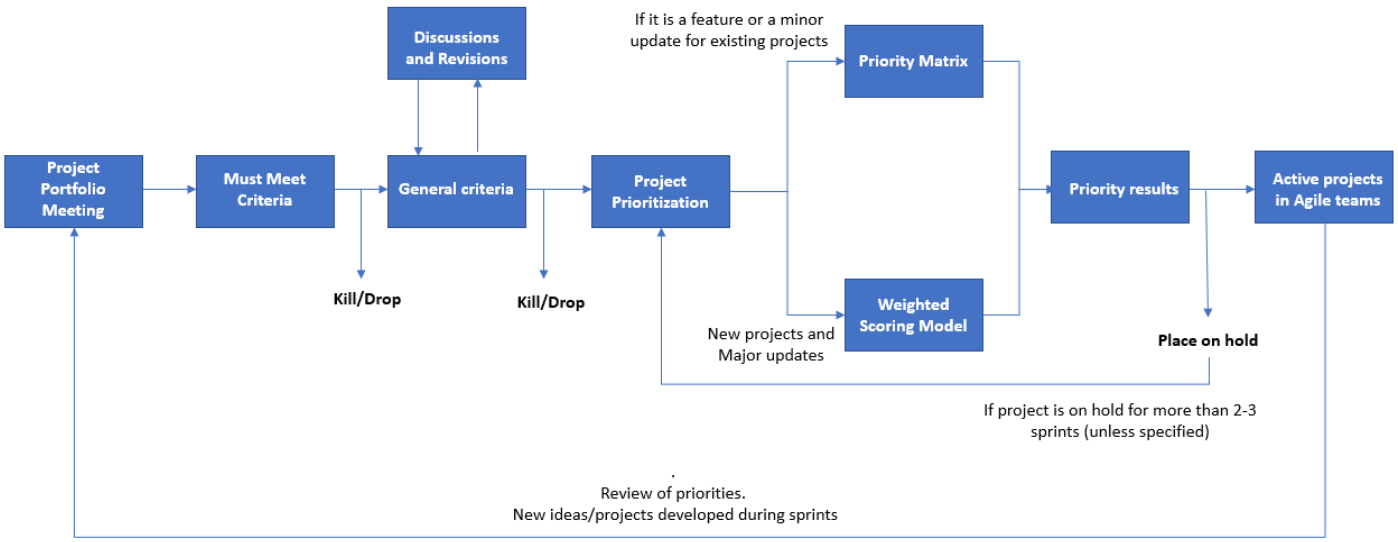

Figure 11: Detailed steps for Gates Dominate approach

6.1.1 Must meet criteria

The portfolio governance team must be able to distinguish between viable and practical project ideas from a collection of concepts or business cases. Important information is presented to the portfolio governance team for them to make a project-related go, no-go, hold, or modify the decision. Without this sort of context, unwanted or misaligned initiatives might join the portfolio, dramatically reducing the advantages of priority projects. Therefore a checklist or a value stream mapping template is essential to screen the project and understand its potential.

The must meet criteria evaluation is a **non-negotiable stage**. As shown in Figure 11, projects get a go or kill decision at the end of this phase. It is crucial to note that in this scenario, the criteria are not predefined (no cut-off parameters or values), but rather take the shape of a checklist that the project owner must complete. This is mainly because this process is designed for a team within a large organization that already has a fixed budget and fixed resources. Projects in the context of digital innovation can vary in scope and predefined criteria may inhibit innovation within the team.
The primary checklist for this stage includes -

- A list of:

    1. Budget needed for the project: This is to ensure that certain projects do not drain the budget allocated to the team for innovation.
    2. Teams/Departments involved in the project: A list of teams or departments that have an impact on the project must be provided. Because there are fewer individuals accessible for projects, it is necessary to communicate and check if the human resource for the project is available.
    3. Countries affected by the project: The organization operates in several countries, each with its own set of procedures. A list of countries to whom the solution is offered must be included.
    4. An approximate estimate of the time required to design and develop the project.
    5. Approximate estimate of the time required to implement, launch, and roll out the solution to all users.

- Technical landscape: The organization's technical landscape refers to the available technical resources that may be utilized to build a project. It covers the IT infrastructure, software licensing, and such. The project owner must address the question, "Does the project fit within the technological landscape of the organization?" If the response is no, the project owner must offer a list of additional resources required to develop the proposal.

- Added Value: Value added by a project can be categorized in 2 ways.

    1. Value added to the end user - The project manager must explain why the concept or proposal is required or helpful to the end user.

    2. Value added to the business - The project might also be beneficial to the firm in a variety of ways. This must also be clarified.

- Scalability of the project - As previously stated, equipment rental businesses frequently operate in different regions with varying levels of market maturation. When a solution or project is applied to one of the areas, it should be evaluated to see whether it may be

applied to other regions. Another technique to scale up digital projects is to introduce new features to improve and broaden the scope of the project. Project managers must indicate how the project could be scaled up, if there is a possibility to do so.

- Validation of the project: Is the end user genuinely in need of the project? If not, does the end user consider the project to be valuable and worthwhile? Has the project concept been discussed with the target audience? Is there data to back up the project's worth? The project manager must respond to these questions by developing a business case and confirming the proposal with the end user using relevant business tools.

It is crucial to note that changes to these criteria may be made at future sessions depending on input collected after completing this process.

6.1.2 General criteria

Portfolio management necessitates a methodical way of distinguishing among prospective projects in order to identify which are "best." What exactly does "best" mean? Every company has its own definition. When a solution is generally accepted by consumers and is scalable, it adds value to digital innovation. Certain projects may have a high potential to offer value to the team's success and should be fine-tuned or altered before becoming an official part of the business portfolio. As a result, the project owner must complete some general criteria in the form of a supplementary checklist or questionnaire. These criteria are negotiated between the portfolio governance team and the project owner. If possible, the project is revised and added to the portfolio; otherwise, it is dropped.

The supplementary checklist or questionnaire includes -

- If the project needs to be promoted then the project manager must list all the resources needed for the marketing campaign.
- Certain innovative projects may be novel to the industry and the users, and hence individuals may require training to use the product or solution. If training is required, a list of resources for educating the users should be included.
- Certain digital initiatives need knowledge of the domain in which the project is being produced. If the company does not have in-house professionals to help with solution creation, the project manager must look for suppliers that can help with training or directly creating the project.
- Digital solutions must be maintained, and clients must be given with services connected to the stability and functioning of these systems. This can be done by the company directly or through third-party agencies or contracts. This must be stated in the proposal.

The governance team may feel compelled to alter the project proposal and add new aspects to the project, which must be reviewed by the project owner. As a result, discussions and negotiations between the governance team and the project owner are sparked. The project owner may therefore feel compelled to revise certain components of their project and submit the changes to the board.

6.2 Project Prioritization

The goal of project prioritizing (and, by extension, portfolio management) is to produce the most value feasible. Any firm that maintains a project portfolio must identify and explain what type of project work is most valuable. There is frequently a long list of suggestions for digital initiatives, many of which seem novel and advantageous to stakeholders. Prioritizing activities is vital since there isn't enough time or money to take care of everything at once. Therefore, without a consistent strategy for determining the relative value of all initiatives, lower value projects may be prioritized over higher value projects. This is also reflected in the interviews as seen in section 5.3.5. Because there are so many different stakeholders and they all appear to have contradictory ideas about how projects should be managed, traditional methods usually fall short of expectations. This is why a governance team needs a consistent method of determining project value. The governance team meets at this point to discuss various projects and their project pitches in the portfolio. It is critical that every member of the governance team knows the project's implications, objectives, aims, and added value. This helps in the prioritization of the project not just by business votes but by the potential of the project.

There are many ways to prioritize projects as seen in section 3.4. While most organizations utilize the Net Present Value (NPV) approach to evaluate projects, this becomes difficult to track in the case of the digital innovation team since calculating the NPV of a project is not a practice. The use of financial models, such as (NPV), is one of the most common approaches for analyzing projects to make Go/Kill decisions. The equipment rental sector produces money by providing a wide range of services. In the case of digital solution services, however, they are add-ons allowing customers to monitor their equipment. As a result, it is an extra service to improve customer experience. The NPV of the projects, as well as probability distribution curves, are given to management. These same models, while so sophisticated in their management of financial estimations (revenues, expenses, profits), are woefully inadequate in their treatment of the resource constraint problem—resource availability is seldom factored into the financial calculation (R. G. Cooper et al., 2000). As indicated in section 5.3.1, one of the primary barriers at Riwal to fostering new innovation activities is a lack of resources. As a result, a tool that can take this problem into account as a parameter should be explored.

Projects such as an online platform for monitoring and renting machinery must be evaluated using a variety of criteria. A scoring model can be used to do this. A scoring model can help the governance team to assess the projects from multiple directions. The benefit of a weighted scoring model is that it enables a team to prioritize some criteria over others. By employing this model, the portfolio governance team may highlight certain business requirements while also taking into account a number of different factors. An large set of criteria provided by Aristodemou, Shaw, and Tietze may be utilized to create a score methodology for projects using the stage-gate decision-making process. A smaller governance team can decide the importance for incremental features and minor upgrades to existing projects by utilizing simpler mechanisms for review.

Following the development and implementation of the portfolio scoring methodology, each project will be assigned a project score. This score is important at the project start phase when deciding which projects to include in the portfolio and how to allocate resources to them. Higher priority projects require the greatest available resources to perform the task on schedule and with high quality. Furthermore, when resources are insufficient to staff all of the authorized projects, lower priority initiatives should be begun later, after sufficient resources are available to begin the task. When lower priority projects are put on hold for an extended length of

time (2 or 3 sprints, unless otherwise indicated), they should be reintroduced to the project prioritization phase to determine whether the priority has changed or if the project needs to be archived.

6.3 Priority Matrix

Minor updates and features frequently do not need complicated approaches for prioritization. They are easy to implement and have a reduced implementation time. As a result, it is also necessary for the review and prioritizing processes to be simple and fast. One such simple method to evaluate these updates is the Project Prioritization Matrix. The Project Prioritization Matrix assists corporate executives and managers in delegating work, prioritizing new features or problem fixes, and ranking individual project parts by priority. A Project Prioritization Matrix can be created in a variety of ways, based on what needs to be analyzed and the type of project being assessed as shown in section 3.4. Impact / Urgency Priority Map helps the team to measure the importance of certain aspects inside a project based on their impact on the entire business and the urgency to complete specific pieces for new features and upgrades in digital innovation.

The matrix comprises two coordinates: one indicating if a project has a high or low impact, and the other indicating whether the project or feature is urgent or not. The impact and urgency of the feature or upgrade are decided by the digital team's specialists using internal criteria and are validated by the local teams in different countries. A list of features and updates is necessary to use the priority matrix. The smaller governance team discusses these features and upgrades. The team then assigns these projects to various quadrants of the matrix. The four different quadrants represent varying levels of priority. At the end of this phase, high-priority features and updates are developed first, while low-priority ones are put on hold. An Impact / Urgency Priority Map designed has four key categories as shown in Figure 12.

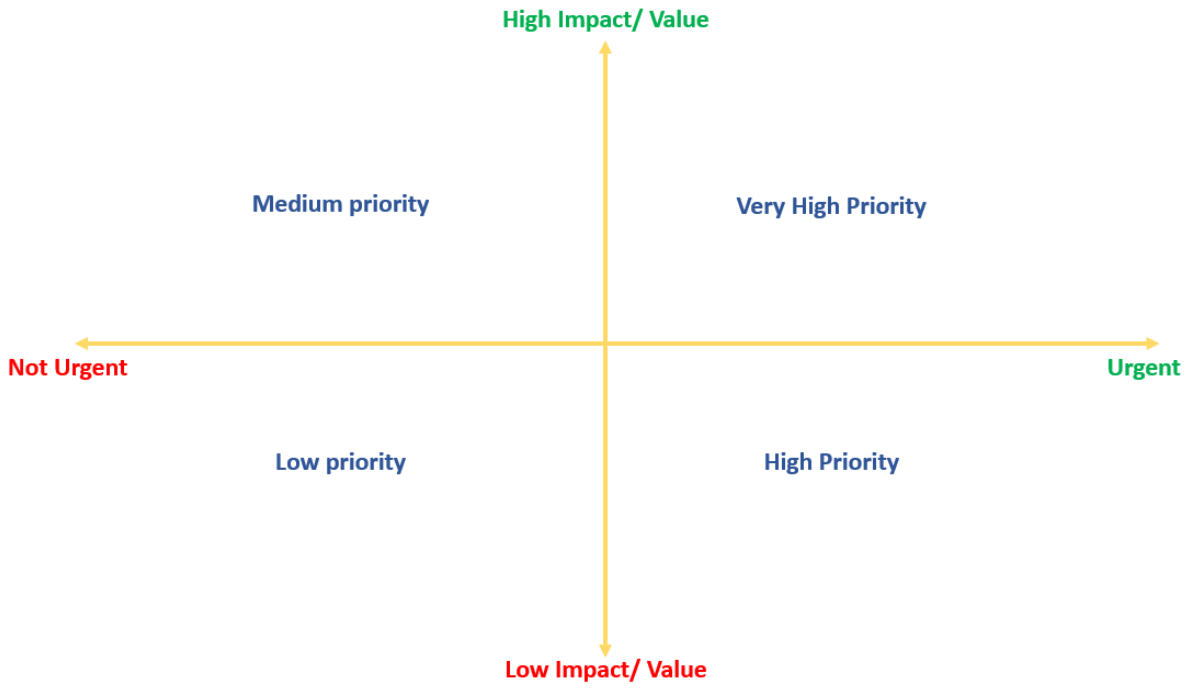

Figure 12: Impact/Urgency Priority Map for new features and minor updates to existing digital solutions

Very High Priority: Priority is given to projects that have a high impact or add great value and must be implemented as quickly and easily as possible. It is critical to highlight that features and updates are not bug fixes, therefore the pressure to develop and deliver them is not as high. However, the items listed in this quadrant have the greatest priority among the list of features and improvements.

High Priority: Some features may need to be launched quickly but may not have a high impact or add a lot of vale to the customer experience as they maybe affecting the business in the back-end. These updates could relate to the technical back-end or maybe a niche feature used by a few customers that need it on demand. These are high priority features/updates that follow soon after the Very High Priority features/updates.

Medium Priority: A feature that several consumers would want to see in an application, portal, or website may be requested by several customers. This may bring significant value to the customer experience, but the team may not consider it urgent since they have other obligations to complete. These features/updates have a medium priority and will be addressed once the Very High Priority and High Priority tasks have been completed.

Low Priority: Various brainstorming sessions, inspiration from other programs, and fresh ideas may be used to design features and improvements. However, these may not have a large influence on the customer and may not have to be implemented just immediately. These are 'good to have' features/updates that are prioritized low. These can be developed when the team has the necessary resources and time.

6.4 Weighted Scoring Model

Many organizations consider project prioritization to be a financial process, but it is much more than that. The issue is that each stakeholder and member of the governance team can have a different opinion on the relative value of the portfolio's undertakings. That is why it is critical to create an evaluation system that takes into account multiple criteria. For a rental equipment business that has day-to-day operations, it is essential to map the digital projects with multiple criteria of the business. As discussed above, a score model can assist the governance team in evaluating the projects from many angles for a range of projects. A scoring model generates a numerical score that may be used to readily compare projects. Furthermore, a firm may compare the project scores of ongoing projects to the project scores of completed projects to determine if the portfolio's relative worth is less than or greater than the value of completed projects. Therefore, for this process a weighted scoring model was chosen for the priority setting of projects in the portfolio prioritization stage of the gates-dominate approach.

The portfolio scoring model has the following components: the model's criteria, the weight (importance) of each criterion, and scoring anchors to evaluate each criterion. A good scoring model will align the governance team on the highest value activities and quantify the portfolio's risk and value. To develop a scoring model, the first important criteria need to be determined. The expert interviews were analyzed, and ten different criteria were discovered. The interviewees' statements were coded into criteria. The weights assigned to these criteria were determined by the frequency with which the codes appeared in the interviews. However, the frequency number is not proportional to the number or percentage of weight. The validity of the weights was deliberated with experts from the digital demand and supply teams. The

explanation and the implications of each of the criteria have been provided in the following sections. The criteria weights and their impacts (positive or negative) have been listed in Table 17. The designed score sheet has been illustrated in Figure 13. The portfolio governance team assigns a score of 0 to 100 to each project based on the criteria. A broad range of values is supplied to differentiate across projects, down to the decimal point. The steps for filling the score sheet are:

1. In the score sheet, projects in the portfolio are listed and described in the columns 'Project,' 'Project manager/lead,' and 'Details.' To provide context for the project, write a one-line description.
2. The governance team look at the project pitch information in the portfolio and try to analyze it based on different criteria.
3. The team looks at the priority index that acts as a scoring anchor. The priority index for the scoring sheet is shown in Figure 14.
4. Each team member writes down the scores ranging from 0-100 for a specific project next to each criterion.
5. Steps 2 and 3 are repeated for all the projects in the portfolio.
6. Once scores are added, the overall project score appears on the 'Total Scores' column.
7. The projects are given priority based on scores. Highest priority goes to the project with the highest score in the sheet.
8. The priority governance team discusses their respective priorities and deliberate on the differences. This stimulates discussions from multiple perspectives.
9. The team then makes a unanimous decision on the priorities based on the scores.
10. Projects with low scores are placed on hold.

Range	Priority Index
0-20	Very Low
21-40	Low
41-60	Medium
61-80	High
81-100	Very High

Figure 14: Priority Index for the Scoring Sheet

6.4.1 Business Value

There is no universally accepted definition of "business value." However, when it comes to projects, business value refers to the advantage that the project's outcome provides to its stakeholders and the organization that is undertaking the project. In the rental equipment industry, digital innovation solutions are frequently added services that improve the customer experience. Users can use tools like the online portal to rent and off-rent machines without having to call the rental desk. Monitoring fuel consumption, CO2 emissions, invoices, and

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1				20%	25%	-5%	5%	15%	5%	10%	20%	10%	-5%	1
2	Project	Project manager/lead	Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
3	Project A	1		10	30	40	20	0	0	20	50	20	22	21,4
4	Project B	2		65	80	45	46	69	87	69	85	73	67	75,6
5	Project C	3												0
6	Project D	4												0
7	Project E	5												0
8														0
9														0
10														0
11														0
12														0
13														0
14														0
15														0
16														0
17														0
18														0
19														0
20														

Figure 13: Weighted Scoring Sheet for portfolio management of digital innovation projects

Criteria	Weight	Impact to the weight
Business Value	20%	Positive
Customer Value	25%	Positive
Operational Costs	-5%	Negative
Return on Investments	5%	Positive
Technical Feasibility	15%	Positive
Ease of Use	5%	Positive
Marketing Potential	10%	Positive
Potential for Scalability	20%	Positive
Ease of Implementation	10%	Positive
Time for development	-5%	Negative

Table 17: Criteria for scoring and their weights

active and inactive machines are all features that provide a unique selling point to the rental agency as a whole. Thus, projects add business value by automating and digitizing existing projects or by providing the organization with a competitive advantage. It has a positive weight in the scoring model because projects that add value to the business must be prioritized over projects that add less value.

6.4.2 Customer Value

The success of a project is typically determined by how well the results meet the needs or expectations of the end user, which is why customer value should be at the forefront of project planning. The digital innovation team develops IT solutions in the form of applications and must understand how the business or customers will use those applications. In addition to using feedback forms to understand and engage with customers, metrics that track the number of active and inactive users for an application must be used to track customer engagement. Customer Value can also be monitored by keeping track of the increase in the number of users. However, these figures can only be determined after a project has been launched, so project managers must conduct on-site research to determine whether customers are interested in the project and see potential in it. The project manager must have supporting data to provide to the portfolio governance team for them to score the project against these criteria to the best of their ability. This criteria has a positive weight in the scoring model as the value added by projects for the customers was the most common theme that was highlighted by every interview participant.

6.4.3 Operational Costs

Operational costs in the field of digital innovation are costs incurred by the company for:

- Cost for production/development

- Utility costs
- Service and Maintenance
- Administrative expenses - (Promotions, Rolling out, Training)

The current IT paradigm states that a company develops an application (or purchases elements), implements it, and then maintains it. Once it's up and running, the cost of maintaining it is a fraction of the cost of building or purchasing it. Platforms require a commitment to ever-increasing spending on technology as well as ever-increasing spending on the people who support and implement that technology. In this case, the budget for the digital innovation team is fixed, and the projects in the portfolio must use this fixed budget. Because the costs are fixed, the weight of this criterion is relatively low, but its impact on the portfolio score is negative.

6.4.4 Return of Investments

Return on investment (ROI) is typically calculated by taking the project's actual or estimated income and subtracting the project's actual or estimated costs. This figure represents the total profit generated or expected to be generated by a project (Hassanzadeh & Bigdeli, 2019). Monitoring ROI for digital innovation at Riwal is difficult because the approaches are new and are an added service. However, ROI can be tracked in a different way by determining whether the project reduces operational costs in other areas such as rental desks, sales, and services. This criteria has a low weight in the scoring system and has a positive impact. Although this has not been actively mentioned in the interviews of experts, literature on different scoring model criteria are of the opinion that it is important to evaluate a projects potential in a quantitative fashion as it can help evaluate benefits of a project using tangible measurements.

6.4.5 Technical Feasibility

The process of determining whether a product or service is functionally viable is known as technical feasibility. Managers must plan every step of the process prior to project development, from development to tracking performance and maintenance. In this scoring model, it has a positive correlation to the weights. If the technical feasibility is high, the project should have a higher score than the other projects in the portfolio. Managers should gauge the technical feasibility of a project by answering the following questions:

1. Does the project fit into the technical landscape of the organization?

Technical landscape refers to the technical architecture, software licenses and applications available within the organization that can be used for developing the project.

2. Does the company have the expertise to develop the project? If not, does an external agency need to provide some help?

3. Can the company utilize internal resources or does it need additional software or hardware resources from an external agency?

Rental equipment companies are generally not IT experts and thus technical feasibility plays an important role in development of digital solutions. If the project is too complex and involves too many technical resources that are outside the scope of expertise or the technology landscape of the company, the projects may become unappealing to the rental equipment company. This is also reflected in the interview results as seen in section 5.3.4.

6.4.6 Ease of Use

Ease of use is a fundamental concept that describes how simple it is for users to use a product. It is the ease with which a specific technology can be learned. Given that the rental equipment industry is still largely based on legacy systems, and that different regions have varying levels of maturity in their respective local markets, it is critical that software solutions provided are easily learned by users. The differences in maturity of the regions are highlighted in section 5.3.7. This makes it essential for the solution to be simple and the interface should be easy to navigate. This criteria has a positive impact on the weights of the score sheet.

6.4.7 Marketing Potential

Market potential assists businesses in better planning and launching their products and services. It entails planning strategic activities to advance a project's goal or objective. Project managers must determine whether the solution requires a large marketing campaign to promote it, as well as create a fixed list of resources that may be required for the campaign. This criterion has a high weight because marketing campaigns raise awareness and encourage more customers to use the solution.

6.4.8 Potential for Scalability

Scalability refers to expanding the solutions. To scale solutions, the digital department can take one of two approaches. First, there is the scale up approach, which involves adding features and upgrades to the solution. The second approach is the scale out approach, in which the solution is gradually rolled out to different regions or areas where the business operates. The goal is to make the most of the resources available to your application in order to achieve or maintain adequate efficiency. The scale-up vs. scale-out approach is entirely dependent on the type of project. In order to become the market leaders in the area of digitization, projects with the possibility of scaling up need to have higher priority and therefore it has a positive weight in the scoring model. Riwal's ambition to become a digital leader necessitates scalability in their innovation ideas. According to D1,

"We should always be in continuous improvement of these kinds of solutions. And always try to look more ahead like for what what what will the market demand in five or 10 years instead of looking at what they need today? And that's a bit of a mindset change that we we have to go through"

6.4.9 Ease of Implementation

The phase in which the developed project must be launched is referred to as implementation. The launch may be complicated at times due to the application's resources, size and load. The solution will also be rolled out to different regions or user groups as part of the launch. Local regulations, resources available in the region, acceptance, and so on can all have an impact on this. This criteria has a positive impact on the weight of the scores.

6.4.10 Time for development

Time for development, as the name implies, is the time required to design, develop, improve, and launch the project. Complex projects may take longer to complete, putting a strain on available resources. Project managers must estimate how long the project will take to develop and how many teams/people will be needed for development. Projects that require more time to develop are usually unappealing unless the benefits outweigh the time commitment, which is why this criterion has a negative weight in the scoring model. This is reflected on both the business and the customer side of the rental equipment industry. Since the operations are day-to-day, in the interviews D3 states

"It is because our market and equipment is very day to day. When they order it today and they want to have it yesterday. Sometimes our management and we self also act like that."

6.5 Agile Methodology

Agile software development is becoming more popular among software professionals since it ensures rapid software development and high-quality software solutions (Matharu, Mishra, Singh, & Upadhyay, 2015). The Agile approach is a style of project management that divides a project into stages. It entails continuous engagement with stakeholders as well as continuous improvement at each level. When the project has begun, teams go through a cycle of planning, execution, and evaluation. The ultimate benefit of Agile development is that it enables teams to provide value faster, with higher quality and predictability along with better adaptability to change. Scrum and Kanban are the two most popular Agile techniques. As stated in the interviews in Appendix B, the development team or the "digital supply" of Riwal uses scrum methodology to build and improve digital solutions in Riwal. All work is separated into uniform time-boxed iterations known as "Sprints," which take typically two weeks to complete. During the Sprint, the team tracks progress in stand-ups (also known as scrums), which are 15-minute sessions.
The team has two critical meetings at the conclusion of the Sprint:

- Sprint Review/Retrospective to highlight the work accomplished and learn from victories as well as losses.
- Sprint Planning to plan the next set of tasks for the new sprint.

Each task is assigned a ticket and has a varying priority based on its type. The team keeps track of tickets using JIRA, a project management platform. Tickets might be linked to new updates, features, maintenance, issues, bug fixes, and so on.

The **hybrid-agile methodology** has been created to solve communication and interdependency concerns in interdisciplinary teams. According to Riwal Holding Group specialists, three departments are reliant on each other for resources, inputs, support, and operations for digital solutions. They are:

1. Digital Innovation
2. IT (Data Management)
3. Marketing

The process is new and was applied during the course of this study. The process has been illustrated in Figure 15 and Figure 16. DMI process in Figure 16 refers to the name of the project board DMI - Digital, Marketing and IT. Several measures were made to implement this process. First, representatives from all three departments met to explore various process management and project management concepts. At this discussion, it was determined to employ a hybrid style of working by combining the agile approach with the preferred method of working for each team. JIRA was the platform of choice to track the progress of this process and its effectiveness. Atlassian's JIRA is a proprietary issue tracking solution that offers bug tracking and agile project management. Teams would create a project board on JIRA to detail all of their projects that are reliant on one another, and the projects would be discussed in sprints. Sprints last roughly 4 weeks, and at the end of each sprint, there is a sprint review/retrospective meeting to analyze the sprint's progress and challenges. In JIRA, projects are allocated as epics, and tasks are separated into sub-epics inside the project. Each epic and sub-epic is allocated to a person in charge. Updates on all projects in the project management board are sent out through email once a week. The goal of the project management board is to

- Communicate plans about ongoing projects to increase transparency.
- Strategically align interdisciplinary teams in projects.
- Incorporating feedback for continuous improvement.
- To work in a centralized fashion

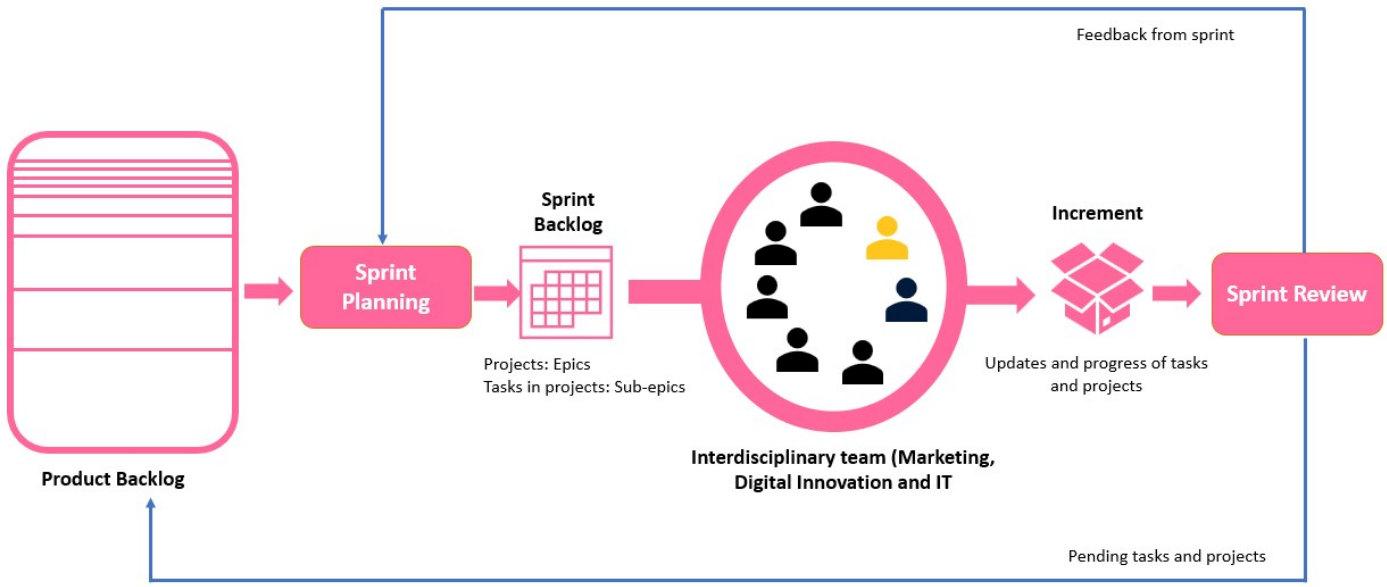

Figure 15: Scrum framework

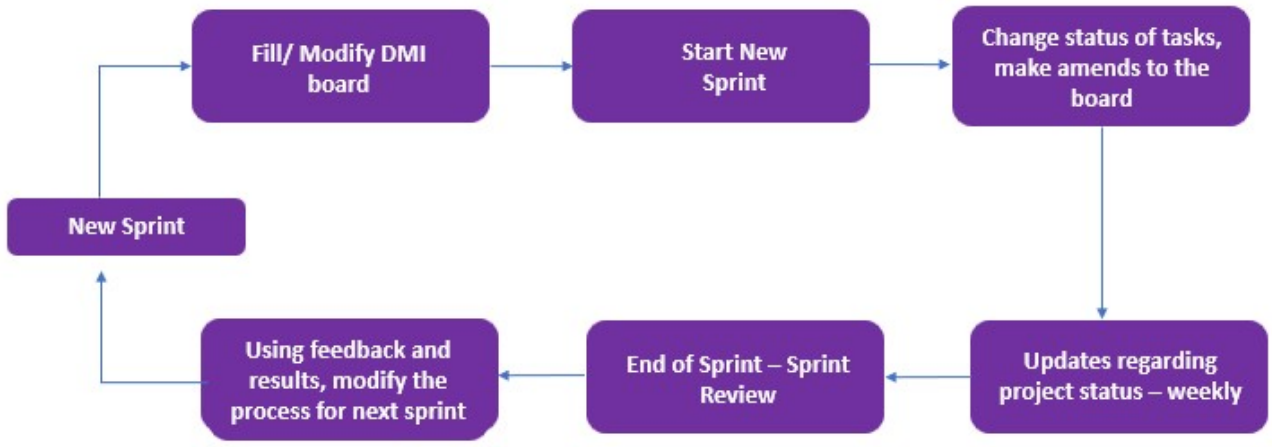

Figure 16: Agile - Hybrid process

Three sprint cycles have already been completed. Based on feedback from each sprint cycle, the approach was enhanced further. Each sprint cycle's observations have been described.

6.5.1 Sprint 1

This was the first sprint performed following the creation of the JIRA board for project management. This sprint included tasks from Digital Innovation, IT Data Management, and Marketing. Some of the initiatives required collaboration among different teams. The sprint lasted four weeks, and projects were separated into tasks/phases on the JIRA board.

Observations:

- ***Opportunities:***
  1. Within the first sprint, it was observed that the interdependencies between the three teams was well reflected on the project board.
  2. SPOCs for tasks were visible and thus making it easier to track progress or contact for updates.
  3. Because the platform was simple to use, on-boarding participants to the project board was quite simple.
- ***Challenges:***
  1. SPOCS needed to be pushed to update the project board regularly.
  2. The time-frame provided as an estimation for completion of projects were sometimes inaccurate.
  3. Not all tasks allocated in the sprint were completed.

6.5.2 Sprint 2

The sprint review meeting at the end of Sprint 1 spurred debate about process changes for the following sprint. The issues raised in Sprint 1 had to be solved. A weekly 15-minute stand-up meeting was scheduled to ensure that SPOCs kept the board up to date. Projects were reevaluated in order to establish an approximate time-frame for projects and project activities. Proposals to extend this process to different Riwal departments were discussed.
Observations:

- ***Opportunities:***
    1. Updates on projects and tasks became more regular.
    2. Transparency on information and data sharing between teams increased.
    3. Opportunities to expand the process to other departments - to start establishing centralization in the organization.
- ***Challenges:***
    1. SPOCs' conflicting schedules restricted participation in 15-minute weekly stand-ups.
    2. Interdependent projects that were 'stuck' lacked updates, resulting in minor conflicts of interest across multidisciplinary teams.
    3. Tasks allocated to staff who later left the company remained unaddressed for an extended period of time.

6.5.3 Sprint 3

The weekly stand up was effective for updates on the JIRA board, but it was producing scheduling challenges and time constraints for the SPOCs of different teams, according to the Sprint 2 review meeting. In a separate session with experts and project teams, solutions or alternative approaches to projects whose status had remained unchanged for an extended period of time were examined. The notion of a weekly stand-up meeting was abandoned, and it was decided that one representative would send weekly emails to all members of the JIRA board. If SPOCs did not submit an update, the update log would indicate this.
Observations:

- ***Opportunities:***
    1. Updates on the project were still regular.
    2. Projects were better prioritized using the experience from Sprint 1 and Sprint 2.
    3. All undertaken projects were listed and their progress was visible to the three teams.
- ***Challenges:***
    1. Issues with estimation for time-frames of projects.
    2. Resource constraints in teams due to lack of personnel.

7 Discussions and Recommendations

This thesis identifies many challenges and factors that impact digital innovation activities in a rental equipment organization by combining the observations with knowledge from the literature study, expert interviews , and market analysis. The thesis also offers scoring system for rating and ranking the portfolio of digital initiatives for the company. This chapter discusses the implications of this study and provides recommendations for enhancing the process while outlining the limitations of the study thus answering the question ***'To what extent would these models be feasible to the international rental organization in terms of business operations?'***

7.1 Discussions

The goal of this research was to design a process for digital innovation portfolio management in the rental equipment industry. It all started with the opportunities offered by Riwal Holding Group, with their objectives to expand digital innovation initiatives in the market to become a digital leader in this industry. The research evolved from a narrow objective to a broader assessment of the rental equipment industry. Literature addressing this industry is very limited which the literature review started with a broad theme of digital innovation and was then focused on agile-stage-gate hybrid models for IPM. As mentioned in section 3, there is limited literature on the topic of project (portfolio) management in the context of digital innovation and even more so on agile-stage-gate hybrids.

The database made available by Riwal Holding Group was used in the expert interviews that were performed for this study. In AWP, Riwal is a specialist. We are aware that there are two categories of businesses in the rental equipment sector: generalists and specialists. The major concern is whether generalists and other experts would be able to use the research's conclusions and answers. It is conceivable for other businesses in this industry to adopt the process developed in this research given that individual features like criteria and scoring models are adjusted because generalists and specialists operate in comparable marketplaces and are impacted by comparable trends and barriers. Due to the subjectivity of business criteria, factors, and objectives, it is crucial that other businesses perform internal qualitative research to change and modify these as necessary. The conservative and conventional character of this industry and its clients is a major challenge that all businesses operating in this sector must overcome. The majority of consumers come from the conservative civil and construction industry. Firms find it difficult to overcome this problem. However, a change that promotes digitalization of these industries has been brought on by the pandemic in 2020. The use of online platforms and digital data monitoring solutions by customers to monitor the performance of their fleet is predicted to increase as a result of anticipated regulation changes and legislation connected to sustainability in the construction industry.

The factors and challenges described in this study are only a few of the many aspects businesses must be aware of while attempting digital transformation in similar industries. The factors derived from expert interviews such as digital transformation, competitive edge, and industry trends are applicable to many organizations operating in traditional industries (extending to rental equipment business) and have also been reflected in literature reviews on digital innovation. Similarly, challenges such as organizational structure, lack of expertise, response to change, and maturity of the industry can also be generalized to organizations in conservative

sectors. To identify these challenges and factors, the interview questions were open-ended and further probing questions were used to gain additional insights.

As mentioned several times, the designed process for this research is an agile-stage-gate hybrid model. The agile methodologies were already implemented by the development/digital supply team of Riwal. However, as stated in section 6.5, to deal with the issue of interdependencies among the teams working on digital projects, a hybrid agile process was added. Agile processes are built around continuous improvement, and in the three sprints that were observed, projects and processes were improved with each new sprint.

It is necessary to determine in advance whether a process model meets certain required specifications. Potential problems can be identified and, if necessary, the model can be modified before it is used for implementation by incorporating verification at the design stage. Transformational accuracy, or the correctness of transforming the model's requirements into a conceptual model and the conceptual model into an executable model, is examined during verification (Wynn, Verbeek, Aalst, Hofstede, & Edmond, 2009). There are four types of verification: formal, informal, static, and dynamic. The business process described in this paper is focused on improving portfolio evaluation methods for a rental equipment organization. Informal verification is the most ideal verification for this since it relies on the opinions of experts. Riwal experts were given a thorough explanation of the process. The "Gates Dominate Approach" was deemed a suitable strategy for portfolio screening and prioritization. The two halves of gate 3 in the stage gate model focus on balancing and prioritization of the portfolio, thus making it a suitable base model for portfolio evaluation. The experts provided feedback on the 'Must meet Criteria' and 'General Criteria'. Scalability was under general criteria in the first iteration of the process model, but based on expert advice, it was moved to must meet criteria as digitization and digital transformation of operations is a company focus.

Validation of the process should be performed to ensure that an existing relevant problem has been solved. It consists of determining whether the new model accurately represents the real-world scenario. The validity of the scoring model needed to be established. In order to test the relevance of the scoring model, a session similar to that of a portfolio prioritization was arranged with the members of the digital demand and digital supply. A total of eight members participated in the testing of the scoring model. The list of participants can be found in Table 19 The first step was to educate the members about the process design and the scoring system. For this, a workshop was created and the material used in the workshop can be found in Appendix B. The process and criteria were explained during the workshop, which was followed by a working session with the score sheet. A hypothetical portfolio was created in order to use the score sheet. The portfolio created did not include pitch information listing all of the items under 'Must have' or 'General' criteria, as recommended by Riwal experts. This was performed to prove the importance of using these criteria to evaluate projects in a portfolio. Six projects from Riwal's digital innovation wish list were used for the portfolio as shown in Table 18. The projects were explained briefly to the team. The team was given time to complete the score sheet. Team members filled out the score sheet to the best of their abilities. After everyone had completed their score sheets, there was a lengthy discussion about the priorities and differences in the scores.

Project Name	Project Description
Urgent Needed Machines	Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he must pay more.
Feedback Mechanism	Ask for feedback after off-renting a machine / closing off a rental
Add Machines Manually	Show 'third party' and competitor machines / allow the user to add these machines manually to have an overview of the total amount of machines on site
Show Machine Prices	Communicate damages and breakdowns via pictures and video calls (with the technical support desk)
Damages Report	Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type)
Digital Training	Offer digital training exercises which explain how to use the machine (e.g., tutorials, playful exams, VR, etc.)

Table 18: List of projects in the test portfolio

7.1.1 Observations:

Due to knowledge gaps, it was discovered during the training workshop that the process needed to be elaborated further for certain members of the team. Clarity was required for the various stages of the process. As this was a test session and the difference between the theoretical approach and the real-world setting was bound to be visible, the project list in Table 18 was provided with the bare minimum of detail. This was to comprehend the significance of the criteria used prior to portfolio prioritization for filtering projects as well as to recognize the potential of a project.

During the discussion phase, when members discussed their scores and priorities, it was discovered that the majority of members ranked the project "Show Machine Prices" highest and the project "Feedback Mechanism" lowest. Although the reasons for giving the project high or low marks varied, the scoring method and weight distribution in the scoring system demonstrate some balance among different criteria to reflect the correct priorities. The middle order of importance among workshop participants slightly differed. This might be attributable to a variety of factors. One of these might be due to a lack of data on the initiatives. The team members had to depend on their tacit knowledge to evaluate the proposals because they were provided without a pitch or supporting data. Another explanation might be human nature. Because each human perceives relevance and importance differently, people's priorities may differ. Differences may also develop because the interpretation of criteria and their implications for the scoreboard was not well understood. This might have been owing to the criterion description not being clear and easy to understand. It was also observed that during the discussion phase, differences in opinions also led to the generation of new ideas that could be discussed as new projects in the future. The discussion phase promotes debates and ideas that promote innovation. Due to time restrictions and lengthy negotiations, the team was unable to reach an agreement on the middle order of tasks. This must be considered when the procedure is implemented in Riwal.

Feedback received after the workshop was mostly positive, encouraging that this process was necessary to establish the right priority for the projects being undertaken by the digital supply team. A couple of them complained that a 100-point range was too complex and hard to score with. Another criticism raised was the amount of time necessary for the workshop. Ideally, teaching employees how the process works and process implementation occurs at two separate time intervals.

Number	Role
1	Digital Innovation Specialist
2	Group Manager for IT and Digital Innovation
3	Tester and Scrum Master

4	Android Developer
5	iOS Developer
6	Web Developer
7	Web Developer
8	Web Developer

Table 19: Participants of the workshop for testing score model

7.2 Limitations and Future Research

This study has a number of limitations that must be addressed, but it also provides potential for additional research. The first constraint, also mentioned in the literature, is that there is no one-fit-for-all process for IPM. The process designed in this research is applicable to the digital innovation team at Riwal. This may not be applicable to certain organizations of different nature. The strategies utilized in this thesis, however, may be reproduced to create an appropriate process for different businesses. As previously said, factors and criteria are subjective, thus these firms must conduct individual assessments if they plan to use comparable processes for IPM. The second constraint is the setting in which the data was acquired. The interviews were conducted only with one organization that was a specialist in the rental equipment industry. Due to limiting the data set to one group, the validity of the data gathered needs to be checked. To broaden the study, a method that involves additional ways of assessment such as surveys or questionnaires with other businesses in the same industry can be used. Another limitation of this research is that the items listed under negotiable and non-negotiable criteria for project evaluation have not been validated in practice while testing the process. The items listed need to be validated by putting the project evaluation phase into practice.

7.3 Recommendations

The discovered factors and challenges, when employed correctly, serve as gateways that inspire businesses to address them when establishing a portfolio management strategy. Rental equipment companies are not IT companies and therefore lack the skills and experts to develop digital solutions. Highly skilled teams that work on several projects must know where to focus their efforts. When conflicting demands force employees to choose where to spend their time, the relative priorities must be clear so that high-value work is not hindered by resources working on the lower-value activity. Therefore resource mapping needs to be periodically conducted within the company. As addressed in several interviews, organization structure plays a vital role in harboring innovation. Given the influence that political biases may have on portfolio evaluation (those in positions of power frequently veto portfolio decisions), portfolio review meetings must have mandates in place. It must be agreed upon by all members of the portfolio governance team to respect the team's decision. Every member of the team is treated equally, and no individual has the authority to overrule choices made by the group as a whole. To ensure that all perspectives are considered when the team evaluates the portfolio, the team must comprise a diverse group of experts, each skilled in their own field. The group should not just limit itself to managers but also include certain employees involved in various phases of projects.

Projects must have all information listed in "Must Meet" and "General" criteria in the form of a project pitch. This would enable the governance team to understand the project's potential as well as map it against different scoring criteria. The governance team must discuss or analyze

all of the initiatives in the portfolio before grading them. This is because each member is an expert in their own profession, but they must be aware of the project's significance in other fields. For example, an IT developer on the team may be unaware of the business implications of a project, whereas a business analyst may be unaware of the technical constraints that must be addressed in order to accomplish the same project.

Using a scoring methodology with a range of 0-100 points might be difficult, especially if the governance team is big. The scoring method must be developed further to a fixed interval scale. The correctness of this technique has yet to be proven in a real-world environment, thus it must be explored before being incorporated into the scoring system. The present approach stipulates that each member of the team fills up their own score sheet, and then the team debates various priorities to achieve a consensus. It is recommended that during this discussion phase, the team fills out a score sheet unanimously to obtain the priorities of different projects. Since this approach is new for Riwal, it is advised that the projects prioritized and allocated to teams are closely monitored and the priorities are reviewed in the future portfolio evaluation meetings.

The most immediate issue of implementing this process is changing the present evaluation method. Because not everyone will be on board with the transition, efforts must be taken to emphasize the importance of this process. The organization must reform the portfolio governance team for digital innovation projects and must train the team to function with this process. Improvements based on comments from the development and IT teams on priorities must be considered, and the process must be developed further. This should happen in iterations, and the modifications should be conveyed to all stakeholders engaged in the portfolio's decision-making process.

The process is an agile hybrid type and therefore continuous improvement needs to be a focus while implementing it. Improvements should be directed not just at the evaluation strategy, but also at project planning and development. Since interdependent teams like digital innovation, marketing and IT are collaborating with each other using agile methods, there has been a degree of transparency introduced within these teams. However, there are still problems with communication and the use of the project management platform JIRA. Process mandates must be in place so that team members and representatives offer frequent updates and successfully use the relevant technologies.

The process focuses on the prioritization of digital innovation projects for Riwal. The current criteria in the weighted score model focus on project development and implementation. However, one of the goals of the portfolio management approach is to promote innovation and thus, innovation or innovativeness of a project can also be considered as a criteria in the score sheet by the rental equipment company.

As seen in literature (section 3.3.1), the project portfolio of any company should have a healthy mix of projects that balance the long-term and short-term strategies of the company. The designed process addresses how to screen different projects but in the future, after the priority governance teams have gained some experience with prioritization and balance, they should also include steps that help in a project mix across three horizons: "short-term" "mid-term" and "long-term" projects of the rental equipment organization.

8 Conclusion

This section answers the primary research question of the study and explains the answers to the sub-questions. This study's objective was to design a process to evaluate and rank ideas in a portfolio for digital innovation in a company that rents out equipment.

SQ1: What are the current trends in digital innovation for the rental equipment industry?

Summarizing the market research which was a part of desk research, several trends in the equipment rental industries were identified. Due to logistical and budgetary constraints, many businesses in construction now lease their machinery and equipment rather than purchasing it entirely. This trend is expected to continue due to expected changes in regulations in the construction industry. Covid-19 has brought in a new wave of digitalization in traditional businesses and therefore creating a demand for digital solutions. Electronic-platforms, big data, Virtual reality training, and Internet of Things are gaining importance in the equipment rental business. The rate of digitization is, however, relatively modest in this business because it is still very conventional.

SQ2: What are the factors that promote the development of new digital tools in an international rental equipment organization?

The effectiveness of digital innovation initiatives inside a rental equipment company is influenced by a number of factors. These factors tend to promote innovation and encourage the rental equipment company to invest resources for new digital solutions. These factors were empirically determined using interviews and mapping it with the desk research. In total, nine interviews were conducted and the participants of the interview were experts from Riwal Holding Group. The interviews were then coded to determine various factors such as:

- *Digital transformation:* With radical developments like online marketplaces and rental equipment platforms, the business is experiencing steady transformation. Customers in the sector welcome this shift since it gives them access to new services and enables them to monitor their equipment with the aid of data presented by these platforms.

- *Project management:* Project management in the digitization of the rental equipment industry addresses a number of areas that encourage the creation of digital solutions. One of the project management techniques that assists the teams in offering solutions and improving upon them is the agile methodology.

- *Competitive edge:* Competitive edge is ascribed to a variety of elements, including cost structure, branding, quality of products, supply chain, intellectual property, and customer support. Process and service innovation boost an organization's competitive edge and therefore promote innovation in the rental equipment organization.

- *Industry trends:* More businesses are automating operations as machines become more sophisticated. Major players in this business are using digital solutions, despite their novelty in this industry, therefore the rental equipment company must stay on top of the developments.

- *Team structure:* The rental equipment company's journey toward digital transformation can proceed more smoothly if a cross-functional team is in play. Since they can provide

perspectives from all areas of a business, a team made up of members from all departments will be able to produce the best ideas and solutions.

- *Support and Motivation:* To produce new opportunities, employees must be motivated to put their skills to use. The equipment rental company must also be willing to foster ideas and motivate employees to come up with solutions or implement changes. Employees that are driven to develop their skills fully support the transformation strategy and think they can contribute to making it a reality.

- *Training:* One of the keys to advancing the human element of digital transformation is through providing learning and development opportunities that not only impart knowledge to current employees but also draw in desirable new talent. Additionally, customers must receive training and information on how to utilize the new tools. In order to encourage clients to embrace the solutions provided for them, efforts must be taken given that the equipment rental business is very conservative and resistant to change.

SQ3: What are the different challenges that impact the prioritization of innovation processes of the digital innovation team in an international rental equipment organization?

Managing organizational change and digital innovation always poses new challenges. It poses strategic problems for both established players and recent digital disruptors. Challenges may impede the development of digital solutions and can also block new innovative ideas within the rental equipment company. From the nine interviews with different experts from Riwal Holding Group, different challenges were identified using qualitative coding. These challenges were then mapped with the findings from the literature review. The challenges identified in this research are:

- *Resource constraints:* To maintain the anticipated speed of development, rental equipment organizations must first solve the issue of a shortage of resources before accepting new initiatives. Prioritizing current initiatives must come before suggesting new ones until the demand for skilled employees is satisfied.

- *Organization structure:* Rental equipment companies typically impose digital transformation (or any other well-known change theory) without connecting it to the realities faced by their workforce on a daily basis. Speed and collaboration are the basic qualities that firms must achieve and perfect. Therefore, there should be fewer levels of hierarchy and greater employee collaboration.

- *Interdependencies:* The majority of digital innovation is made up of several teams that are focused on organizing, creating, delivering, and running the digital services that the rental equipment company and its customers depend on. The communication channels between the teams need to be improved and modified to handle this issue.

- *Lack of expertise:* Digital expertise is in high demand, yet there is a scarcity in talent. To stay competitive, rental equipment businesses must up-skill their staff. If employees are given new, marketable skills, they will feel motivated and appreciated. Another strategy for attracting, hiring, and retaining people is company-sponsored education.

- *Portfolio priority and balance:* Balanced portfolios that are in line with the rental equipment company objectives are usually difficult for businesses to manage. Setting the proper priorities for the appropriate projects is just as crucial as balancing the project portfolio. Using certain project prioritizing methods and creating a priority system will help rental equipment businesses overcome this difficulty and make the process more effective and efficient.

- *Response to change:* Creating a systematic change management approach may be difficult, as it is with any significant upheaval in a conservative business such as the equipment rental organization. To "experiment with new concepts, employees could be reluctant. Communication and training are two factors that can aid in overcoming resistance to change.

- *Maturity of the Industry:* While traditional industries like the equipment rental industry have been slow to catch up, sectors of the economy including technology, media, and finance have adapted to digitization better than others. Despite their possibly being a demand, adoption of these digital solutions is still slow. Innovation acceptance varies from country to country as well. The rental equipment industry as a whole must make an effort to embrace innovation and change.

SQ4: What models can be used to design a process to balance and prioritize the project portfolio of digital innovation in the international rental equipment organization?

To answer this research question, a combination of primary and secondary data were used. The empirical data from the interviews were used to customize a skeletal reference model derived from the literature review. A stage-gate hybrid model was utilized as the base for the design by combining all the findings from primary and secondary data. Two more models were integrated with the stage-gate model. The first is a modification of the stage-gate paradigm. Both portfolio balance and project prioritization have been addressed by changing one of the model's gates by utilizing the "Gates Dominate method" for portfolio assessment. Two phases make up the gate. In order to handle resource constraints observed in the rental equipment organization and other concerns to create a balanced portfolio, the first step filters projects that will be included in the portfolio using checklists and questionnaires. Certain criteria like the value mapping of the project, the list of resources required, and the project potential are non-negotiable in nature. Other factors are negotiable leading to discussions and revisions between the project owner and the portfolio governance teams in the project before it is added to the portfolio. Setting the portfolio's priorities is the second phase. Projects might be thought of as major innovations in the digital world, whilst features added to existing solutions are considered minor incremental innovations. It would be counterproductive to assess these two various forms of innovation via the same lens. Features or minor updates can be evaluated using a simple priority matrix that maps them against value and urgency. Projects of complex natures or novelty can be prioritized using a weighted scoring model. The weighted scoring model developed in this research consists of ten different criteria, each of different weights. They are: *Business Value, Customer Value, Operational Costs, ROI, Technical feasibility, Ease of Use, Marketing Potential, Potential for Scalability, Ease of Implementation, and Time for Development.*. Criteria like Customer Value, Technical Feasibility, Ease of Use, Potential for Scalability, and Time for Development are very important to the rental equipment organization as they are crucial to the rental equipment company's strategy of becoming a digital leader in

the equipment rental business. These criteria have a strong impact on the operations. They also add a competitive advantage for the equipment rental company. The weights of these criteria were determined using the nine expert interviews. A portfolio governance team uses the scoring method to assign grades to each project in the portfolio during the second phase. Based on a priority index, each criterion receives a score between 0 and 100. The total score is the project attractiveness score and the projects having a high total score get higher priority while the projects with low scores get low priority or are placed on hold for a few cycles. The projects with high priorities are allocated to teams that incorporate the agile methodology of project development.

At Riwal, the technology development team already uses an agile methodology for project development. However, they only develop the product or service. Teams like Information Technology (IT) and marketing also play a major role in the implementation of these digital tools due to which there are interdependencies between these teams. These interdependencies can be challenging to manage as each team has its own objectives. Teams work on other projects besides those involving digital innovation, hence a hybrid-agile approach was developed. JIRA was the platform used to keep tabs on and track the development of many projects. Teams' representatives met every four weeks to discuss the projects and to analyze and evaluate them.

SQ5: To what extent would these models be feasible to the international rental organization in terms of business operations?

Changes are often challenging to implement without effective change management strategies. Before fully realizing the design, the agile-hybrid method was introduced to the three teams - digital innovation, Information Technology (IT), and marketing. The members of the team were first trained to understand the process to be followed with guidelines. A training workshop module, as well as a manual, was created for the same. JIRA was used to list all the projects and tasks associated with the projects. Initially, there were issues related to communication and updates on the progress, but these were addressed by modifying the process based on the feedback received at the end of each cycle (sprint). The agile-hybrid process brought transparency and effective communication between teams. The interdependencies were clearly reflected on JIRA which helped in the effective planning of future projects.

The digital innovation team examined project prioritizing using scoring models. The outcomes of the grading system were nearly the same for each member even though the project pitch and project discussion elements were absent during the test. The changes reflected in the score sheets of the participants could be attributed to human nature and lack of sufficient information. To address this issue, recommendations were provided by the researcher to the company for improvements. Project pitches are essential for members to understand the project and map it against different criteria. The negotiable and non-negotiable criteria need to be revised after testing in a real life setting by the rental equipment organization's portfolio governance board. Discussions initiate members to think about projects from different viewpoints. The model designed in this research was found suitable for the rental equipment organization but needs some modifications when implemented in a real-life setting. As with any process, improvements need to be iterative based on observations and feedback after each cycle which is why the process design has a feedback loop.

The limitations of this research need to be carefully examined by the rental equipment organization. The process design also might have some limitations which have been addressed in

the recommendations of this research. Continuous improvement should always be considered in any digital innovation activity by the digital innovation team of the rental equipment company. The range of scores needs to be modified to make the scoring process less complex. The portfolio governance team needs to be diverse with members of different expertise to weigh in on the project's potential. The final recommendation is to educate the importance of change and portfolio evaluation within the rental equipment company for employees to accept and implement the process.

To answer the main research question, ***What steps can be taken by an international rental equipment organization to develop a process for balancing and prioritizing their digital innovation portfolio?***, it is best to summarize this study. The answers to sub-research questions contribute to the main research objective. Understanding the rental equipment industry and the market provides a measure of the important factors to consider while framing a strategy. Similarly, it is essential to understand the different factors and challenges that contribute to digital projects that could become a part of the organization's project portfolio. The challenges need to be addressed in different stages of the process. The designed process acts as a tool for the organization to evaluate its digital innovation portfolio and prioritize projects in the portfolio which is an innovation portfolio management strategy. This study provides an empirical knowledge and understanding of process improvement to the context of digital innovation portfolio management for a conventional sector such as equipment rental and identifies complementing process models in this interdisciplinary area. The designed process provides ordinal measurement of project performance, allowing the rental equipment company to compare and rank projects and also offering an approach for improving project proposals. By further improving and strictly practicing this process, the rental equipment company can manage its digital innovation portfolio. Although this study only looks at one rental equipment firm, the research technique and models employed in it can be applied to other rental equipment companies or businesses in related fields.

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9 Appendix A

9.1 Interview Codes

This section provides the categories and codes derived from interviews.

Code	Category	Theme
Acceptance of digital solution	Digital Transformation	**Factors**
Advantage of digital solution		
Digital Transformation		
Competition outperforms	Competitive Advantage	
Competitive advantage		
Training employees	Training	
Process training		
Training customers		
Support from organization	Support and Motivation	
Supporting ideas		
Motivating employees		
Encouraging opinions		
Project Management	Project Management	
Project Planning		
Resource Planning		
Team structure	Team structure	
Hierarchy		
Decisions in a team		
Market trends	Industry trends	
Industry trends		
Customer expectations		

Table 20: Codes derived for factors influencing digital innovation

Codes	Categories	Theme
Lack of resources	Resource Constraints	**Challenges**
Lack of teams		
Cynicism	Response to Change	
Reluctance to change		
Difficulty in change		
Old fashioned industry	Maturity of Industry	
Traditional industry		
Different maturity levels		
Lack of skill	Lack of expertise	
Lack of people		
No expertise		
Communication issues	Interdependencies	
Overlap in projects		
Interdependencies		
Balance in projects	Portfolio Balance and Prioritization	
Prioritization		
Organization process	Organization Structure	
Structure of company		

Table 21: Codes derived for challenges influencing digital innovation

10 Appendix B

The template of the informed consent form used in this research for interviews, as well as the transcripts of the interviews, are included in the next section. Please keep in mind that the transcripts are not entirely accurate in terms of grammar and spelling. For privacy and data security concerns, information such as rivals' names and the identities of other workers mentioned has been redacted.

Delft University of Technology
INFORMED CONSENT FORM FOR INTERVIEW

Research Topic: Process design for digital innovation portfolio management – A case study for Riwal Holding Group

You are being invited to participate in a research study titled **Process design for digital innovation portfolio management**. This study is being done by Pranathi Srikrishna from the faculty of Technology, Policy and Management at TU Delft in collaboration with the digital innovation department of Riwal Holding Group with both parties consenting to this research via a Nuffic agreement. This research is being carried out as a graduation thesis project as per the researcher's education programme requirements.

The purpose of this research study is to design and validate a process for innovation management for novel digital solutions in the rental equipment industry and will take you approximately **45 minutes** to complete. The data will be used for development of scoring system used within the process and as primary data for the graduation thesis research. During the interview, questions will be asked to collect your insights and expertise related to the various aspects of the digital innovation tools developed by Riwal Holding Group.

As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by limiting the collection of personal and confidential data. The data collected during the interviews will be stored in a personal cloud for security and will be password protected with a password manager. Data collected during the interview will not be accessible by Riwal Holding Group but the results of this research will be handed to Riwal Holding Group. Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions. For any queries or changes, please contact the researcher, Pranathi Srikrishna via email – p.srikrishna@student.tudelft.nl or pranathi.srikrishna@riwal.com

Please read the consent form carefully and mark the appropriate responses.

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated [__/___/____], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves: • An interview with the researcher • Providing personal information such as my name and my position in the organisation • Audio recording of my responses during the interview for data collection • The audio recordings will later be used to summarise key points of the interview • Audio recordings will be stored on a personal cloud protected by a password	☐	☐
4. I understand that the study will end along with the defence of the Master thesis report.		

Figure 17: Informed consent page 1

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study involves the following risks • Data security breach • Misinterpretation of the data provided • Personal data being compromised I understand that these will be mitigated by • Password protection for data storage • Limited usage/collection of personal data • Recordings of data to limit misinterpretation • Anonymisation of the data collected	☐	☐
6. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) such as my name and my position in the organisation with the potential risk of my identity being revealed.	☐	☐
7. I understand that personal information collected about me that can identify me will not be shared beyond the study team.	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
8. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐
9. I agree that my real name can be used for quotes in research outputs	☐	☐

Signatures

_____ _____ _____

Name of participant [printed] Signature Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

PRANATHI SRIKRISHNA

_____ _____ _____

Researcher name [printed] Signature Date

Study contact details for further information:

Researcher's name: Pranathi Srikrishna

Student email: p.srikrishna@student.tudelft.nl

Phone number : +31 613400167

Personal email : pranathi.srikrishna@gmail.com

Figure 18: Informed consent page 2

The interview transcripts can be found on 4TU Research Data repository using the following link: https://doi.org/10.4121/20364657.v1

10.1 Interview with D1

Question: Thank you for agreeing to be a part of this interview in the first place. This interview is designed for the master's thesis project, titled as process design for improving innovation portfolio management. Please note that this interview is being recorded and recorded audio will be used to create transcripts for data collection. I would also like to inform you that personal data will be anonymized, which means that you will not be identified by our name, but would be identified either by your job role or your responsibility. So during the interview, you can refrain from telling your name if you're not comfortable with it. The purpose of this interview is to get your insights and expertise on the digital innovation activities in the rental equipment industry. And using the data collected through this interview, a process structure and validation method would be designed to help develop an innovation portfolio management system. I shall now start asking you questions, please feel free to raise any concerns or questions during the session. Please start by introducing yourself as in what you do at Riwal?
A: Yes, so, I am the digital innovation specialist at Riwal, which is a rental company focused on providing jobs at height. So we mainly rent out equipment like aerial work platforms, telehandlers, sometimes cranes as well. So I work at the digital IT department. And with the focus on digital products we have so together with my manager, we develop digital tools which we can use, or which our customers or external stakeholders can use to work with Riwal. And our focus is now mainly on providing digital tool, which our customers can use to rent out equipment, or rent equipment and, and monitor their equipment in the sense that they can track the usage of our machines, running our co2 emissions, locations, etc. And the idea is to extend that that platform in the coming months. So basically, besides developing tools, we are also always in research of where the market is heading. So we tried to come up with more disruptive technology, innovations and technologies. To become the digital leader in our industry. That's the ambition we have currently, we are not an IT company, but we want to really become the digital leader and the rental industry. And from my department, that's what we try to facilitate with development of the digital tools.
Q: Since you're closely working with digital innovation and digital tools, what does the term digital innovation mean to you?
A: Yeah, I think looking at the our companies build, it means two things to me, like one we have, we have two different types of innovation speed, because we have a lot of we have a couple of mature countries, we which are already, really, we really have in high demand for digital solutions or destroy innovations, like Denmark and Netherlands. And we have a couple of other countries, we also have to take into account we are which are just aiming more for people who only want to rent a machine for one day and just want the ever easy and quick fix. And they are not really eager for digital innovation. So we have to serve both innovation speeds. So in one way, it means that we regarding digital innovations, what it means to me is that for the for the for the lower speed, we just need to facilitate that they have an easy platform to work with, which is fast and stable. or Now we'll call the platform but just a digital solution in general. And at the other end, for the more mature country, we'd like to work more disruptive, and try to look into emerging technology which we can convert into tools our customers go work with. Q: All right, since there are so many innovation activities that you're a part of, how are these innovation activities and processes managed within your organization? A: Yeah, it's actually being managed. I think we just we're now going into transition. So the methodology we're using to develop these, these solutions are by Agile and Scrum, to Scrum, like the specific scrum methodology. So, yeah, we tried to manage that by

keeping the whole holding into account. So what makes the most impact for every country, not just for one or two countries? So that's always the first criteria we have. And the second thing is that we look at is it more is it actually something new or old world enhance the customer experience is actually new. Together with the new ambition we have to become the digital leader. That should always go first. But he said is really since we have a lot of operational challenges at the moment. We have to I managed to expedite our own expectations in that sense. So we can try to be disruptive and really innovative. But you see that we don't have the people to carry our ideas, because we always have to we, we develop the idea at HQ, but we have to roll it out in the countries themselves, and then the people there have to be the owner of the solution. But we don't have really the, the people at the moment to, to carry those tools with the knowledge and the expertise to train other people. And so we have to be a bit careful in that sense. So many regarding managing this, these solutions, we really need to focus on what can be done by the right by the people, like the human resources in this in this in this case, are really important to us. It's also sometimes also the back a bit.

Q: All right, given that Riwal will is a big organization in terms of rental equipment, industry, how do you think that your organization compares to the rest of the industry with the innovation solutions that the company is putting out?

A: Like a couple of years ago, I think five or six years ago, we were really ahead of the game, like really like take a look looking back at what we like the platform and the customer portal and app we already had at the time, there was no such losing biotic competition, but we got a bit lazy. And also in the meanwhile, we were in a transition of a new ERP system. So that also took all the resources of it and digital. And now you see that in that in those years, we were busy with the road of our up. Yeah, the other our competition is, as I say that is almost passing us at the moment. So I wouldn't say that we are not really ineffective anymore. Now that we are almost at the rollout of our new improved portal and platform, you see that we take a leap, a small leap again. But we need to be we shouldn't wait any more. We should always be in continuous improvement of these kinds of solutions. And always try to look more ahead like for what will the market demand in five or 10 years instead of looking at what they need today? And that's a bit of a mindset change that we have to go through? Yeah.

Q: And how do you think the industry's reception has been to these new digital solutions? Have you observed any trends or patterns while working with these solutions in this industry?

A: Yeah, I think it's all becoming more digitalized. Like I think everyone sees that. We are always in, in hardware and physical equipment. But you see that? Yeah, like improving and innovating and innovating your services is, is really focused on digitalization. And then regarding more monitoring data, a bit of E commerce, that's becoming more and more important, that's a really big challenge for rental companies in generally, and then you also think, for all of our at least we like a lot of customers come from the from the construction industry. And that's an I think, in a really can be really innovative industry, which is also always highly dependent on regulation. So you see that once new legislation comes in, or the need to, for example, need to reduce their carbon emissions by 50% in a certain year, that really accelerates the innovation process for the demand for those companies and that we need to serve that that needs. So we need to think ahead already and see what's going to happen in the coming years. And try to adapt our services as well. So I think technologies like robot are innovative in the in the scope of robotics or AR VR, circular building, those kinds of things will be really interesting to us. And that's mostly being driven by construction industry. All right.

Q: Is there any kind of process that your organization practices to prioritize different solutions or different digital innovation practices that are being planned out

in the near future?
A: Not really. It's yeah, I would say it's really comes from a gut feeling. But just really, I really don't like it.But that's the way it goes. Now. Just to be honest, it's by sometimes being decided by business folks. So just raise your hand if you think this should be done first. But there's no qualitative data check, like or research. No validation with customers, or as we are we did in the past on those are I at least I did it. But that's not enough, I guess that was really focused on the two I'm developing, but it should be more on the strategic level. And we aren't into the fundamental of doing this with customers. So we just set up a panel per country with, I think, five to 10 customers from different kinds of industries, okay, before maintenance, construction, aviation search, and we are going to work with those panels per country to do strategic sessions with them and try to come up with a road map for our own company based on their developments. And then we can say, Okay, this is what we see in the coming five to 10 years. And so there's the way we have to move forward with our innovations to keep up the pace and make sure that we offer the right tools. But that's, that's, that's a bit in transition so that you see that the structure is coming. But we are currently still about doing prioritizing with business folks, or people with the loudest voice or real gut feeling.
Q: And how is this current process that's been used working out for these solutions? Are they showing any progress improvements? Or is there nothing that's being mapped from what I hear you say?
A: I think the current hour currently do it or did it in the past with these business votes. And, and you always seem like these, these, these decisions are always made by the same kind of people the same organ, so they're fishing is always a bit narrow. It's yeah, there won't be any disruptive ideas coming in, if the if the same decision are always made by the same people. But see now that if we now that we are, at least within the digital team, we are trying to bring more structure and also evaluate our decision or validate our decisions with actual quality of the data and testing with customers. So one of the one of the methodology we use we're going to use is a B testing. So we're going to propose to the kinds of solutions to two groups of users. And then you see the we can measure the data in our in our in our in our system. And based on the what makes the most impact, that's what we're going to do. Yeah, or maybe we come up with a combined solution, or we go one specific route. And then we were actually more data driven and not making decisions based on our own assumptions, but really validating it with the data from our customers. So that will be an that's already in progress. And it's going pretty well, to see because it's already based now more on the youth on the data we have, you see the usage is increasing. And we get more new active users as well, which is the main goal for now. Q: What do you think are the key factors for fostering or developing digital innovation tools? Given that your job role is a digital innovation specialist? So we again, what do you think are the key factors are important factors for developing digital innovation tools? Given that you're a digital innovation specialist of this organization? A: Yeah, so that's, that's a bit of what I already mentioned. Like we have to deal with these two speeds. I think the for the first week. Like there's more innovating within the box, I would say that's that you track the data of what's currently happening, do a B testing, do qualitative user tests, which are what your customers are do workshops to, to see to understand what the context is their have to deal with and what is happening in their market. And based on that insight, you can just optimize your current your current solution that can that doesn't have to be only digital innovation, but can also be business innovation, for example. And then for the second spirit for, for the more complex countries, for the for the for the customers who are going to ask a lot more things from us. We need to look way more into the future and work more strategic, really try to map where the industry is going. So that we can also decide upon our own priorities. Okay, so

in this five years, most of our companies have to deal with this new legislation. So we have to prepare ourselves for that. And 20 years, maybe some of these companies won't even exist anymore, because they're that industry like fossil fuels or something like that. They will there will be they will disappear at some point and they will transform it into a different company as well. But those kinds of strategic decisions based on the road map of our customers, that's something we need to we need to do and then we can also say okay for this coming year is this or are going to be our priorities is the project that we're going to do that plan or the timeline we don't really have at the moment. Right?

Q: And you've already mentioned a few challenges that you go through when rolling out these solutions or even planning these solutions. But do you think there are more challenges that can happen while developing or rolling out these digital innovation solutions?

A: Yeah, so yeah, again, and like you said, the main thing now is the lack of people and the lack of the right expertise to do these kinds of things. Like you see that you, once you're developing these, these solutions, you will also be coming into a, into a tunnel vision, and you think that everyone immediately understands what this tool is about, they first need to be an expert. So you need to provide training. What we do now is we come over to the countries to sit down with them, do full day training, and do a lot of follow up sessions afterwards. So they really start owning the tool, we also push them to give the training to other people, so they become the full expert. And it works pretty well. I think that's the that's the first thing. The second thing is that you need to need to keep into account that you are dealing with different kinds of markets, different kinds of situations like in F in every country, you come from a different background, with some countries we come from the reward came from an acquisition or from a merger. Sometimes we only do sales over there instead of rental can also can also be the case. So we always try to come up with a universal solution for other countries. But that's actually not really possible. There is no one size fits all, although we try to make that. So we need to, we need to extract more data from the country so we can give them other solutions. Instead of just customizing it for them, we need to come up with maybe all different tools for Germany or for friends, instead of providing them the same platform with and then switching on or off some features. That's a different mindset. And that will take a lot more time as well. But we need to stop that thinking that we can provide a solution that fits all the countries or all and and I say that. So in that case, also, every user, because every user is also different.

Q: So from what we've said, so far, we know that the customers are more open to accepting these solutions, because the number of users accepting these solutions are increasing over time. But how's the response for these innovations been within the organization?

A:depends a bit on what country you come. You see, especially regarding digital innovation, like the more mature countries are really not even asking for it. They basically demanding it like we need this. Because otherwise, because our competition has this. And we don't need to keep up the pace. Otherwise, we don't have any USP unique selling point to provide to our customers. So and but for other countries that internally it's really a struggle, because they don't, they don't that they are more traditional and more conservative. They only still do it. Yeah, they will really traditional way of business. They say Yeah, but you can come over. But we already we already telling you we're not going to really Mark we're not going to push this, this system to our to our customer, we're not, we're not going to put a lot of resources in it. And you can say, Oh, well, it's important and the CEOs that will tell you to use it. But yeah, they need to carry that too, and that rollout and we cannot do that for them. So and we also still haven't fully figured out how to how to manage that. Like what we do now during the

first initial steps want before the rollout to the cluster, all the people involved together like the country manager, the operational manager, commercial manager, to at least everyone is informed okay, this is what we need for you guys this whole these are the tasks you need to do this. So the person we need we think should do it. At this how much time it will take. So that's that whole process is more clear to them. That's the work pretty really pretty good, I would say. But then we need to be some kind of incentive for them to actually start using it to bring it to the customers. And sometimes that's BS, sometimes a bit jealous that you have to be strict and direct there. KPIs or use it, and then maybe add a bonus to it or change something in the organizational structure. And that mechanism is not really researchers not really inflation. I really asked for it a couple of times like, Hey, can we set their game that they have KPIs or targets that they have to add a new X amount of users? Yeah, budget wise is really, really, really difficult.

Q: All right, since the purpose of this research is to design a new process for digital innovation portfolio management, that will require a lot of chance, how do you think your organization responds to change?

I think pretty well. Because we already have been through a lot of changes in the last couple of years. One major change with the new ERP system and now letting every country work fire the reward way, which is basically our philosophy how to provide safe and effective services. But I think the timing has to be right, I think a lot of people are really tired and a bit frustrated, since after the rollout, that ERP system is still not working well. And that's yeah, people are a bit cynic against digital in it at the moment. So I think what we have to do first to, to get them on board and to back us up is that we have to manage what we offer externally. So we always have to the customer should be the always of the highest priority, obviously. But also, we have to serve some internal stakeholders now like we, if we can make their life easier, and make their make the process more efficient. They don't have to do more devs do less manual activities, then we that's I think also something we have to do, like maybe divided to 80% of your time to develop External Tools, and then 20% For internal stakeholders. And then if you come to a major change, like managing a digital innovation portfolio, then it gets something be that they can back you up. And hey, these guys did this for us. So we will help them make this as success. All right.

Q: When designing the new process, what do you think that needs to be incorporated that is currently lacking and the process that's in place right now.?

A: I think a method to quickly evaluate the impact your innovation will make. And also that you at least have done the right research and have to look at the right data to make these decisions and prioritize the projects you want to do. Now it's just based on, as I already mentioned, who screams the loudest who is the biggest voice and it's usually someone one country manager or the CEO. And that's not the way it should work. Like they all they don't they don't really they don't really realize it. But they all they're always biased like they always have some, something that's more within their own scope. So they obviously they will think that's more important like everyone does. Same as I would say that my developing only digital products would be more important than the business process, for example. But we are employed because they are biased, and they are as they're due. And also due to the hierarchy. People always say, okay, then we're going to do that. But if you have to, and you have the mandate, and you agree with all these decision makers, that this is the tool we're going to use to evaluate how much impact our ideas will make, then there's no one that can disagree with that, because that's what you agreed upon that's within your business of winning your philosophy. And so I would say that's something we need to manage that fairly, and also making sure that we were doing the right things.

Q: What do you think needs to be taken from the current process like what is working in the current process that needs to be replicated again and the new process? A: Well, what I think is, is nice is that like our focus is now a lot of on digital and it like regarding innovation or the new things we want to develop if you want to call it and real innovation or not. I don't know sometimes not really innovative, but at least it's something new for our company, you see a lot of collab between the business and IT, which I think is nice because then if only it will develop or digital will develop these solutions. You cannot guarantee that it's actually something that business needs because we are not in direct contact with the customers. And they are there you hear all the feedback and stories from the countries to collect them after their mind. And if we propose an idea or an idea, they can, they can say, Well, that won't work, or that didn't work, because this will be here from the business. The only thing that is really, not really, what everyone has really has is that they heard one thing from one customer and then thinks it's for the for every customer we have. So they like they, they really, they initial they directly going into this tunnel vision. And then okay, this is what we need to this is what I read from this customer, we need to do this. We have no idea if the 99% of our customers will actually want that. And that's a bit of a mindset change that we all need to make, like, what makes the biggest impact for the entire group and not just for one particular customer, which maybe generates wealth turnover, but yeah.

Q: And how do you think if a solution or a process is developed and designed in Riwal Would it be more generalize to other companies working in the same industry? Or do you think it would be very unique just Riwal? because of previous way of working ?

A: think we are one of the few specialists within this field. We are competing more with generalists in the sense that they rent out all types of equipment. So to give an example, balls is one of our main competitors, but they also rent out mobile toilet, toilets, fences, drills, whatever. And I think that we are more specialized with relief with the focus on working on ICT. So we not only providing equipment, we also give advice. Sometimes already at an early stage in the project, we give advice and actually reconstruct the project because they want to work with our machines, which I think is really, really nice, really great stuff. And that's I think the vision of the whole company to become more of that real specialist like if you can have more complex projects, you will you which has some to do with working on hive, you will have you have to think about Riwal. And but that's also. So in that sense, I would say it can it can work for other companies, but we will make we have to we will have more focused on those kinds of customers and projects only for Alec forgot other competitions, who, for competitors who have who have a similar mindset. They don't want to be the generalists, but want to be a specialist and can maybe not only be on working on height, but it can be on different aspects of Yeah, sort of facilitating jobs, then it can be interesting. All right.

Q: That brings us to the end of this interview. But based on the questions that you've had, so far, do you have any additional outputs or any questions that you have from your end?

A: I think now we, since we have migrated to the new ERP system that gives a really, really nice added value that we can extract data from every country because the data source are the same. So it's not it's not contained or anything like it's you can you can make your correlations and your annual data and as because that is all the same kind of data but just from a different country. I think that is great. And now, what we did as a follow up is that we create a lot of dash boarding with these for every country. So we already made a couple of commercial dashboards, measuring turnovers. And also can see a bit of tracking that over time. So you see trends and your time periods and seasons and such. But I think the next step was be like, Okay,

what is the exact what are we going to do with this data? Like how are we going to convert it into actual innovations or so yeah, or just or maybe optimizing our business processes Like, we do a lot of movement with our, with our equipment and we moved from A to B. But you can we start optimizing that. That way of working by a really diving into that data, but you are not smart enough yet to do that. And I think that will also. If you converted in a smart way then you can. If you have some design, you have some couple of ideas and you say, OK guys, this the idea is we have. This is the data we see combining the two and this is the actual way we have to go. And I think that's uh, that we can manage that and we have really golden hands. So that's one thing to add.Yeah. Second thing is that uh, you see that now? UM, like I mentioned before, we are now in the transition of working more agile working scrum and I think within our own team who is familiar with who comes from a an A design background or a software background. That's all for those kind of people. It's really easy for our team as well. But you see that if you are developing digital innovation on these new way new kind of methodologies? For, for, in, within and rental in a company who are more traditional, I think in, in, in general, for, the whole industry. It's a really big you. I really underestimated how much of an change that is for these kind of people like they. They have no idea what it is like, how to deal with it, how to prioritize stuff. They are, really they, they usually work with the waterfall method and they have they have the need for I want to have a planning from A to B and at this point you were going to launch these new features for example. And I said well in the meanwhile just we're going to work more iterative check. The data doesn't work. Yes or no don't look on abandon the idea. Where we're going to start optimizing it. It's for the especially for management are there and with beyond the digital IT . They it's, it's almost seems they hate it. Like they get no grasp on it. They don't have any control and that's really. Yeah. It's really also really fun to see because but they are really like, I don't know you're doing there and how does it work? Yeah, but we decided upon this. You're going to develop this and that. I don't know. I'm going to test this. And if it doesn't work, I'm not going to. I'm not going to continue the development of the of your idea because it's simply not what the customers want. Yeah, but yeah, I know what I wanted that. I see it in the data. They don't want it. And that's really. Yeah, but you see that the this is a new way of working and it scares a lot of people off. While we are getting more control because I am a firm believer that this is the way to go, because then you're actually working data driven and customer centric, but this which is also one of the ambitions we have.

Q: Like you said, the management is kind of reluctant to accept these new ways of working that facilitate the progress of innovation activities within the organization. Uh, how do you think that can be addressed in a way that's more acceptable to them?

A: Yeah, that's a good. I think you can do it in two ways. Uh, I think education is is key. Like you really explain how this methodology works. And also the uncertainty that comes with it like it's really a trial and error thing and they. Yeah, usually was we. We only going to do this if we have the strong belief that actually going to work. And now we are. We know it's something can. Maybe it doesn't work, but that's what we are really comfortable with. That said with that mindset, but they are not. So yeah, I think, uh, presenting them that the whole process like how we make decisions, why we sometimes continue with an idea and sometimes not that that should be there. Mm. And I think the second thing is that you just have an, an A mandate to also allow you to do that because. If you don't, then people are going to start messing again with your process and also the blocks to creativity. The efficiency. And they are like they are people that don't. They want to have their say in, in, in your own process while they have no clue like they only see it maybe once in 1/4 and once you give them an update.

But on the day to day basis, they have no idea and that should they also should not care about that. They should have to trust that. Uh, the people who actually managing that. Uh, who actually did training to manage that agile way of working as the background for it.And that they that they just let them be like and that's really. Yeah. And that you need to have that mandate like on just sounds a bit challenging maybe but yeah that's how it works. And then you can also say, well, this is what we agreed upon you. You should not interfere with our process. So yeah, I think that's yeah, in two ways. OK.
Q: Yep. So I have no further questions. And since the interviews come to an end now, going to stop the recording

10.2 Interview with D2

Question: Thank you for agreeing to be a part of this interview in the first place. This interview is designed for the master's thesis project, titled as process design for improving innovation portfolio management. Please note that this interview is being recorded and recorded audio will be used to create transcripts for data collection. I would also like to inform you that personal data will be anonymized, which means that you will not be identified by our name, but would be identified either by your job role or your responsibility. So during the interview, you can refrain from telling your name if you're not comfortable with it. The purpose of this interview is to get your insights and expertise on the digital innovation activities in the rental equipment industry. And using the data collected through this interview, a process structure and validation method would be designed to help develop an innovation portfolio management system. I shall now start asking you questions, please feel free to raise any concerns or questions during the session. Please start by introducing yourself as in what you do at Riwal?
A: Yeah, so my role in in Riwal HQ is I'm responsible for managing IT innovation. So that means the business side, our platform, MyRiwal, but also data integrations that we have with customers, and creating new solutions with customers on project.
Q: All right, since you're working so closely with digital innovation and digital innovative solutions for the rental equipment industry, what does the term digital innovation mean to you?
A: Yeah, it means that we are, we are a company that's able to be agile enough to move together with our customers and to do new, interested way of working together. So, yeah, innovation means for me, sharing data, be transparent and be flexible. So it's not only for me the outside, but also the inside, it's really important to be innovative.
Q: Okay, and how are innovation activities or processes managed within Riwal?
A: There's a lot of innovation in our company that's being done locally. So we are structured with 16 countries, and they, they have a lot of responsibilities. And then and they have an outer known role, they can decide a lot for themselves. There's really entrepreneurship but also there are efforts to make it scalable, and to also to share these practices. Yeah, there's that we are lacking there. So there's not really an a solid structure on innovations, we have an innovation boards but they like to follow up on existing projects. And not it's like really creating new opportunities. That's, that's come out of the field. So that's, yeah, we are we are lacking our structure.
Q: All right. And since you've been working here for a while, have you observed any trends or any patterns in digital innovation for the industry itself and not just for your company?

A: Yeah, so I think Yeah, so I think the most important thing in our in our business, in our industry is machine data and like to ensure that right people get the right solution. It is important to get this data and it's also scalable for your whole fleet or for the whole business and if it's there, then there's a high demand from our customer to, for example, connect operators do machines or to do other things on in the on the building side, so not only with our machines, but in general on transport or other suppliers. And I see that the industry is not ready for the demand and doesn't have the infrastructure to, to move together with, with this kind of, of opportunities.

Q: And my follow up question would was going to be how the industry has been accepting these digital tools. But since you've already answered that, we're going to move on to the next question. And what kind of digital innovation tools or activities are coming out from your organization that is Riwal?

A: I think one of the biggest innovation is in MyRiwal platform it's on if you're looking from behind from a distance, it, it can be just like a platform. And, but in our business and our industry, it's really a game changer, because the lot of competition has something but they there's not the way we are doing it. So the platform allows us to be really transparent in the way we are operating to show not only data from invoices, but also show data from how we are performing. So I think the platform is. Yeah, it's creating a lot of new tools and new solutions that that makes us innovative.

Q: Okay, and how is this platform being rolled out or scaled up within your organization? A: Yeah, so we, we created so with all the different counties, we have to create it spoke so contact persons that it's that are like the ambassador of the platform. So they do basically the, they are managing the rollout in the country, and we support them from HQ with all kinds of content and all kinds of, like, best practices to how they can do this in the country.

Q: Okay. And what kind of process the Riwal practice to prioritize different innovation projects?

A: Yeah, we, we have an Gantt chart, we have, like an overview of the projects. And once a while they are they're presented to the owner and to the management board. And after that, we are saying it's, it's a, it's a one project two project or three project, so we are prioritizing it. And then, yeah, then after our budget is it's known we are making decisions or which projects we can proceed with. So of course, the ones with priority one, they come first. And then if they're still money left, we do the second and a third.

Q: And do you think that with the process that you currently have there are any challenges or improvements that can be done to help innovation activities be better in your organization?

A: Yeah, I think we are really money driven with innovations. And I think that's, that's a really complex combination to really want to earn money in the in the in the first phase or so yeah, I think we are blocking a lot of good ideas, because we want to see your business case instead of and, and change in doing business.

Q: All right. And what do you think are important factors or important topics, while developing new digital innovation tools?

A: Yeah. From our side its leadership, I think we, if you if you don't have leadership in this, it's really hard to make progress. And the way people understand your vision or the intelligence of an innovation is that's really complex. So yeah, if you if you're presenting this, if you are, like, try to roll this out in the company, you have to make it really easy and to make it really understandable. And that's it as I think it's a complex combination with innovations.

Q: Okay, I see that. And how is your organization's response to change or accepting new processes or new changes within the company?

A: A lot of people, they want to, but they are kind of easygoing on change. Like, they see that we have to develop, we have to create new ideas. But I think our fundamental and, and also the, the problem that we have, and that we buy our product, and then rent it out, is that we are not owning the development of our product. So those parts are, yeah, are less flexible to innovate on so people are always open to discuss this because we don't have the resources or with the fundamental to make big steps.

Q: All right. And with regards to digital tools, like the MyRiwal platform, how has the response been to that tool? Outside the organization within your customer circles?

A: Yeah, really positive. So but it's yeah, it's especially the combination of that, that we believe in the in the two that we're selling it. So yeah, I think it's, it was a game changer on so many projects that they choose Riwal instead of the competition, because we had, we had such a nice tool

Q: And since this project is dealing with developing a new process for managing different integration activities. What do you think is lacking in the current process that your company is using?

A: Yeah, resources I think I think we have if we are having resources and leadership, it's it's doable, but if you if you have a management that's only looking at cost. Yeah, it's complex to make some sense.

Q: And with the new process, because sometimes there's always something nice about the old process that should be carried forward. So in the new process, what do you think should be taken into consideration from the old process?

A: Yeah, I think we are now right to control more based on the list on, like, progress on deadlines, etc. And I don't see that that's really positive for our for our innovation, because now it's getting a little bit more corporate and that combination, I think it's another really good one. All right. I need to be more open you need to be more Yeah, I don't know. To. Like, bro, projects like this you cannot approach on an old school. way like it, there's not an there are so many insecurities that that that you that you need to act in your project also a little, little a little bit less like a one structure with one vision need to be more open more flexible I think. All right.

Q: Just one final questions based on the questions that we've had so far. Do you have any other questions or additional inputs that I need to consider during this research projects that are probably missing out on in terms of designing a new process?

A: Yeah, I think good companies like we will you need to find a do that. That, that, that makes sure there's trust, there's stability, but also the room for, for creativity and for also not. Yeah, try. If you structured too much, if it's too much big brother's watching you it's, it's not going to work. So you need to find you need to connect people, the people that that that understand each other and have the same goal. And then try to create a platform that's also given the stability to do kinds of initiatives. So that's, that's I, I see it as a combination. So you need to create an environment that people like are creative and they you take them outside of their daily work because if you do try to get everything in this organization, I don't think it's going to work. All right. So there has to be a change in the way people communicate with each other and also where they are so in their own landscape in their own environment. I think you you can change a lot.

Q: All right. Thank you for all your answers. This one this to the end of the interview, and I will stop recording this interview right now.

10.3 Interview with D3

Question: Thank you for agreeing to be a part of this interview in the first place. This interview is designed for the master's thesis project, titled as process design for improving innovation portfolio management. Please note that this interview is being recorded and recorded audio will be used to create transcripts for data collection. I would also like to inform you that personal data will be anonymized, which means that you will not be identified by our name, but would be identified either by your job role or your responsibility. So during the interview, you can refrain from telling your name if you're not comfortable with it. The purpose of this interview is to get your insights and expertise on the digital innovation activities in the rental equipment industry. And using the data collected through this interview, a process structure and validation method would be designed to help develop an innovation portfolio management system. I shall now start asking you questions, please feel free to raise any concerns or questions during the session. Please start by introducing yourself as in what you do at Riwal?
Answer: Okay, my name is [Redacted], and I'm responsible for global IT within Riwal. So actually, that's the goal of Director IT.
Question: All right. And could you also let me know what exactly your responsibilities in the company are usually with digital innovation?
Answer: If you look at the current situation is, of course, support and maintain the current applications, build an application for change, and innovate so that we can implement new digital innovations for our customers and internal company.
Question: All right, perfect. And what does the term digital innovation mean to you working at Riwal?
Answer: Yeah, we have a lot of machines, of course, that we are rent and sell. And there are people from Fleet and operations are busy with physical innovations on top of those machines. And if you want to compare in these kinds of market, you not only can have physical services but also digital disruptors. You also need to implement digital services on top of your machines, so that you create digital disruptors, innovative ideas, where clients see the benefits, why they choose for us for rental and not for the competitor
Question: All right. And how do you think the innovation activities are being managed within Riwal?
Answer: In the moment, we had a commercial innovation team, what was being led by, by the commercial people, and they had a full focus on the innovation part for customers. So we're on commercial side. And we the first plan was to set up a framework where every client could see their information about their equipment that was rented. So that's what we set up the MyRiwal portal as a basic and made a road-map together with all kinds of enhancements and nice features for the future. But the downside is on that part is that you're really focused on one sort of solution. What we didn't do at the moment at Riwal is set up a sort of brainstorm idea room where everybody think about the top three new ideas for our business or our clients, and do the fact it's almost to do with a sort of product development strategy at the moment at MyRiwal and not on an innovation part anymore. So that's why we have a manager digital innovations required to make this happen.
Question: And apart from these, what other challenges do you see the current process that Riwal be adopting to prioritize innovation within the organization?
Answer: is because our market and equipment is very day to day we they order it today and they want to have it yesterday. Sometimes our management and we self are also act like that. So priority, setting strategic goals for the future is always mid and long term. So the ultimate

goal, the focus is always on day to day. So how do you balance between helping the operation now? And also setting some things in movement for mid and long term? That's the challenge here within Riwal at the moment.

Question: Okay. And what do you think, Riwal position is when compared to the rest of the industry in terms of innovation itself.?

Answer: For the outside world, they think and see that Riwal is very innovative, and also digital, we even won a prize in 2021 by the MyRiwal portal, the app and the BIM services. To be honest, the fundamental grounds on which these kinds of products or solutions are built on and the process part around it is not rock solid yet. From an IT perspective, or digital perspective we need to go back to the drawing table again. So if you want to implement number two, number three, number four, we don't have the authorization for change and the platform for change. So it looks like from the outside, it's look fantastic. And that's the downside of it. Compared to for instance, [Redacted] our competitor, they build up an fundamental platform for digital transition, they are not exploring yet, physically to the market. But they are internally I think, a step further than we.

Question: All right. And also, we were talking about how receptive the organization is to change, is Riwal very open to change, or is there still some roadblocks ahead for evil to accept change, especially in processes and adopting innovation activities?

Answer: Yeah, that's a very nice question. I know maybe, you know, the old cartoon with the two pictures, the who wants change, and everybody's raising his hand, and then say, who wants to change and then nobody raising his hands. So that's also to do with here. And I don't say that only, it's going very well at teams and sites where there are more young people, but young mind that there are also people that work a lot for a long time for Riwal, and they are still changeable, they are easy to adopt the change. And the nice example is that within Denmark, we have around 18 People that works with the rental desk for more than 20 years with an old program. And they can all they can do the rental order blindness, they get the new change of applications. And it's cost very, very long time to unlearn what they did, and learn what they need to do. In UK, they have very young, small team, they are all under the 30. They didn't work with the previous application suite, and they now are back in business in five weeks, and they don't make mistakes. So it's not a does not only do with age, it's also what, what did they do before and how long? And are they capable of adopting that change? So it's a little bit both ways.

Question: All right, and also have as the response to the innovation been outside the organization, we're talking about how responsive the company is within the organization that's between different troubled countries. But how is it been with the customers if you have any idea about that?

Answer: I think it's good because if you look at 20% of our customers now sorry, 80% of our customers produced 20% of our revenue. So and the 20% of our customers producing the 80% of our revenue and that specific 20% are the very IT Savvy kind of customers like [Redacted],[Redacted] and [Redacted] etc. Those companies are really digital by the heart. So they expect also partners and clients and suppliers that are being digital. So if you can ask Fokker they work with only us and not with the competitors because we had a direct API layer between our systems so that they can easily see their own machines, but also our availability of all our machines. So if you express that kind of innovations or possibilities outside, then you can easily and fast adopt on that change. You will really, really responsive on that.

Question: Yeah, and what do you think are the important factors to harbor foster innovation within the organization? Because it sounds to me that innovation is the

heart of the progress for Riwal, but what do you think are the factors are important points that needed to be considered, while we are trying to develop these.
Answer: Now, what we saw in the in the past, also within revolt is the time to market. For instance, when we implemented MyRiwal 1.0, the time to market was very slow. And because of the slow time to market, and every client speeded up, we didn't talk about scalability. So if you can, maybe more implement the time to market with small, minimal viable products, you can easily adopt on that change from the outside, that is very important, and internally and externally that they see the progress not always are we very good, especially also not in IT, we are not very good communicators. And the third thing is thing, I think, if the clients can see the benefits of that digital innovation, they will pay for it. If they pay for it, then internally, you have very good stakeholder management to do because you have funding to for your innovation, and you can get leverage, it gets attention. So you have always the chicken in the egg, hey, where do I first invest? Or do I have if a client wants to pay for it? Sometimes you have to do a little bit both to know, to speed up with that. Yep.
Question: Yeah. And also, since this project is related to designing a new process, what **do you think is lacking in the current process that needs to be incorporated in the new process of trying to manage a portfolio?**
Answer: Yes, and that I call it value mapping to the strategy. Normally, I'm used that if you have a strategy, for instance, we want to become a digital rental leader. And that means A, B, C, D. And then based on every stream, or every department, they determine a projects or initiatives, and you can score that kind of initiatives on how much do they contribute to the strategy. And if that score is very high, it's ultimately gives a very high priority. Yeah. And if you don't do that, then priority setting is very dangerous. And also, not always, we put our money on the right spot or time. So I think if that's missing in the current process for sort of business value mapping or strategy or something, or was always the business benefits calculation or something like that, if you if we count that in, then the priority will run by itself.
Question: All right. But sometimes we also need to take the good things from the current process to the new process, do you think there's something really good that's working in the current process that could be also incorporated in the new process?
Answer: I think personally, the, what we did with current road mapping already defined a sort of, okay, this is version one, this version two, then we first do version 2.1. And then 3.0. And what's sometimes the long the line, there will be vague, but it already gives you sort of direction. Where are we heading? There? I think that's one, it's very good. And other thing is the team who is now organized. It's not on HQ on digital sites with one commercial guy. Now it's commercial operations fleet finance, maintenance workshop. So in in basically all the responsibilities from the country, company, sorry, are involved. So the, if some ideas they're pitched, and everybody likes it, then ultimately the whole company likes it. Yes. They represent the whole company.
Question: Perfect. Apart from this, there are no more questions that I have. But do you have any additional inputs to add based on the questions you've answered so far, that need to be considered, while thinking of a new kind of process outlined for Riwal?
Answer: That's not maybe a process outline. But normally, I'm used that innovation is in ecosystems, and not only inside the company. So I would always involve universities, with students with a sort of hackathon, ask some questions, but also our vendors and partners. So now we have an IT partner but we also work with [Redacted] and [Redacted]. Our vendors have the machines, you have to work with their product development teams, where are they

heading on? How can we align on each other strategy? Is there a contractual possibility with your suppliers, for instance, that they have to bring two or three ideas in the current year that you put it in the contract not only give support, but that you also sort of make it an obligation that they deliver proactive suggestions to us.
Question: All right. All right. Thank you so much for your time. And this brings us to the end of this interview. I will stop recording this interview and if you have any concerns about intermediate addresses to me after the recording ends

10.4 Interview with D4

Q: I started. Thank you for agreeing to be a part of this interview for the master thesis project title process designed for innovation portfolio management. Please note that this interview is being recorded and the recorded audio will be used to make transcripts for research purposes. I would also like to inform you that the personal data will be sued on optimized, which means that you will not be identified by your name, but either by your job role or your job responsibilities. The purpose of this interview is to gather your insights and expertise and innovation activities in the rental equipment industry. Using the data collected through this interview, the process structure and validation method would be designed to help develop an innovation portfolio management system for new projects. And if you have any concerns or questions during this session, please feel free to ask them right away or raise the concerns right away. Introduce as to what job role you're doing at Riwal and what the responsibilities entail.
A: Okay. So before to the team leader for the development team in Dubai, basically, we are taking care of the development part. Starting from the planning to the implementation part, we are taking care of that. So I'm into the team learning process. And I'm also working as a tester for what are the projects that the team is handling right now. And also taking care part of the scrum, which is like currently we are doing the agile methodology for the team. So I'm taking part of the scrum master role as well. So these are the main three roles that I'm taking care of at the moment.
Q: Yeah. Since you are aiding in the development of digital innovation tools for Riwal, what is the term digital innovation mean to you?
A: Innovation? For me, I would say improvisation or that's the proper term that I want to use actually, improvisation and implementation of new ideas.
Q: Yeah, yeah. And how are these innovation activities and processes managed within your team?
A: We have We are strictly following the agile methodology. So we are always welcoming the ideas. And we will discuss on the planning meeting, and we decide how we will design and implement and we'll deliver to the customer. So the stakeholders they will say,
Q: okay, and how are different features, different updates or different developments? prioritized within your team?
A: I will go for the word. What's the current needs of the stakeholders? That's how we are prioritizing the needs actually, for example, we have five tickets in the loop. And everything is in the high priority, we will have we on the planning meeting, we will discuss an audit and we will find out which is a very high priority one that needs to be considered on the coming days. For example, what is the one which stakeholders is really looking for and what is what is basically hype important thing that they really want to continue the work. So we prioritize the ticket accordingly. And we will start implementing the ratio according to the priority, according

to the need of the stakeholders at the moment we're prioritizing.

Q: Okay, and how are these priorities? Also for new features taken into consideration? Is it the same process? Or is it a different process?

A: Priorities? We will differentiate between the, for example, like what was things that we already implemented? And what are the new features that are coming. So we'll divide a sprint into for example, if you're taking six tickets for us, will give priority for the three tickets which is has to be considered with the new features that we are planning to implement, and three features which is high priority, which is already implemented, and we need improvisation to that part.

Q: Okay. Given that your team is working on a lot of digital tools, what kind of tools? Is your team responsible for Riwal or manlift?

A: Remain the applications that are currently having the rental app? Yeah, at the moment, and we have the portal and we have a sales photo app. Okay. Yeah. So we currently we are developing applications on both platforms, for example, pharmacy on the web platform and on the mobile platform, and that too, for iOS and Android, we have two different.

Q: Okay, perfect. Perfect. And how do you think has the company been responded to these tools that you've been developing? How is the company's response to it?

A: Welcoming, that's what I would say actually, like, they are the one who appreciate all the changes. And they are the one who welcomed all these changes. And for example, they have their own ideas to implement for all those different tools. For example, I would say, as a user, as a common user, we all know that new technologies are coming in both on iOS and Android, as a company, they are already really happy about all those new changes. And they really want those changes to be implemented in the application as well. So I would say welcoming, that's a short word that I can use, what they're currently doing with the tools, and they are taking care of the suggestions that we are giving to the company. For example, we are saying that, okay, this would be better if we can implement it, they are really, they listen to it, they learn about it, then they come back, then we'll start implementation.

Q: Okay, and how is the response been from the customers and for these innovation tools?

A: I will definitely say, if I'm comparing the old one and the new one, the new one has more reach than compared with the old one. With all this new features and the user friendly atmosphere, I would say, more customers has started using it. And one other tool called mix panel, what we can understand that the outreach of the new project is very high. And we are happy about that production electric, we could do we can we have already did better. Now we can do more better for them, for bringing up with the other customer. For example, if I'm saying 100 Customers most probably is 70 or 80 Customers maybe have already started using the platform. They are we should be working on to bring the 100 customers to the platform actually. So slowly, we are working on it. We are planning to implement more features to the project, which will welcome the whole customers who are saying back.

Q: Yeah. Okay. And what do you think are the important factors, while developing these tools that help in developing these tools as well? Like what do you think are like important factors or resources?

A: Important factors is discussion, I will definitely say it's a discussion part, for example, we have a team of five or six, discussion is a main important part, for example, they come with a point, we discuss about it, and we decide how are we going to implement it? And how what is the solution that the company going to get after implementing it? So I would say discussion is the main factor. Okay, yes, yeah.

Q:Do you think there are any more additional factors that contribute to developing

these digital tools?
A: As of now, I'm getting only one point at the moment, there might be many actually. Yeah. Not sure at the moment.
Q: Okay. And what kind of resources do you think an organization should provide for helping development of the digital innovation tools?
A: Luckily, they have already provided to us a platform to learn, we already have the club condition with the Udemy. Every developers and every team members have access to, they can keep on updating their knowledge, they can improvise their knowledge, they can learn new thing, they can keep updating about the new technologies that coming up. So that's why at the beginning, I said company itself is an open arm. For every, every team members of mine, who have given a provision to learn new thing, don't stick to the old one company requires more new technologies, and they're ready to give a path. Now, as a team member, we should be taking initiation to bring it up.
Q: Okay. And what do you think, are the challenges that your team faces while developing these digital innovation tools?
A: Communication was a main factor, for example, being a team in another continent, and discussions happening on other continents, it's communication was a big factor. At the beginning, it was a big factor nowadays, everything is I would say everything is have moved to the single pipeline, I would say like, you know, now that every clarification is made, every communication is documented, everything is a clear is getting clear and honest, before implementing. So I wouldn't say communication was a problem before now. It's not anymore. Actually. I'm really happy to say that.
Q: And do you have any technical challenges while developing these tools?
A: maybe, I would say, I don't know. I'm actually because I'm not the very better one to reply to that question, because I'm not into development. I'm just doing the testing part. I'm asking the testing part actually, currently, we are not automating the projects that we have done. So I don't know about the tools and requirements at the moment. But as of now, if I'm asking you about my profession, I would say no, we are we are happy with what we got.
Q: Okay, with your experience as an employee at Riwal, do you think Riwal have been open to accepting new processes or new changes that has been planned or in the pipeline?
A: Of course, yes. Maybe the very first company that I ever worked on who always welcomed with new ideas, okay. Yeah, I will definitely recommend to other people also actually, because this company is always welcoming everything whatever this is, the discussion is always open to everyone, there is nothing like a higher level lower level discussion is open to everyone. They can read I suppose, and I can go with my points, they will we will discuss about it. And if it is good for the company, we will implement it that too, they will have a reply to everything that your example. Okay, I'm going to the point x, and we'll discuss about and they say that, okay, this is not the correct time to implement it, we won't implement it. But if it is a good point, we will add to the project and we will implement in the coming features. So I would say yes, it's a better company to work.
Q: Okay. And because it's responsive to new change, and this project deals with designing a new process for prioritizing different innovation activities within digital innovation department. Do you think that there's anything lacking in the current process that needs to be considered for the new process?
A: I wouldn't say I'm talking about the current if I'm talking about the current situation, I will definitely reply with a capital N and oh, no, there is no nothing we are lacking. At the moment. There was a stage, but we covered all those things. Happily, we covered all those

things. Now there is no, there's no there is no breaking point. A point actually we have we are getting books and we are working on it. We have discussions, the implementation we are designing. So it's this loop is still going on.

Q: okay, yeah, yeah. And because you're quite happy with the current process. What do you think is that one important factor, or one important thing that needs to be taken from the current process to the new process?

A:I would say, input from the team members actually, as I said, the communication, the input from the team members responding to the input from the team members, that's the thing that we are currently doing. This, I think that we I would really want to take to the future also. Yeah, that will really help as a company that will really help actually like, what they want and what we can implement. That's a two different thing. We're clubbing together will bring up a perfect application.

Q: And based on the question so far, do you have any other questions, additional questions or any inputs that need to be added? Or considered while developing a new process?

A: I would no I don't think so actually, like I don't think there's nothing to be changed as, as an employee as a team member or as team leader, I definitely say that changes will happen in coming future maybe the technology might be changing or the methodologies might be changing. But as of now, we are happy with the what we are currently doing. It's a current proper way. And improvisation may be coming later. But as of now, it's good to go in the same.

Q: Okay. Thank you for answering all the questions because the questions that I've had, so this brings us to the end of the interview and I will stop recording the interview and if you have any concerns about any of the questions or you feel anything that needs to be raised, you can do it after I stopped the recording.

10.5 Interview with D5

Q: Okay. Thank you for agreeing to be a part of this interview for the master thesis project titled process designed for digital innovation portfolio management. Please note that this interview is being recorded and the recorded audio will be transcript it for research purposes. I would also like to inform you that your personal data will be pseudo anonymized, which means that you will not be identified by your name, but could be identified either by your job role or your job responsibilities. The purpose of this interview is to gather insights and expertise on the digital innovation activities in a red liquid industry. Using the data collected through this interview, a process structure and a validation method would be designed to develop an innovation portfolio management system for your projects. Please feel free to raise any concerns or questions during this session. We will start off with this interview right now up Could you please introduce yourself with your job roles and responsibilities at Riwal?

A: Yeah, I'm [Redacted] I'm in the capacity of regional IT and digital manager. Basically, part of manlift group is based in Dubai office where the digital development team is based in and responsible for developing internal and external customer facing digital solutions for Riwal and manlift group. I've been working for Manlift for the last 17 years. And basically from [Redacted].

Q: It since you work with the digital innovation aspect of real environment so closely what does the term digital innovation mean to you?

A: Digital innovation? For me at least, is something that can disrupt the industry I can I should say. I mean, you want me to have a detailed explanation? Or what does that mean to me? Or maybe in a nutshell, how i i see that. Yeah, it's something that gives us as manlift or Riwal to have a competitive advantage over our competitors, when you are giving a solution to them. In simple terms, that is what innovation means to me.

Q: Okay, and how do you think the innovation activities and processes are managed within your organization?

A: In the current setup, we do have we do, we are kind of a demand supply organization where recently, we recently introduced that concept of digital innovation team within our organization. And it's been, I think around for the last six months before that we were not so organized in that respect. So now that there's a clear separation of the demand and supply, plus a dedicated team for the innovation, that is going that is giving a little more structure and insight into the way we are developing applications, even though we are following the best industry standards and practices as a software development team. But when it comes to translating the business needs into final solutions. We were like we were lacking that middle man who's who can act as an innovation specialist who can bring in new ideas and technologies into the data spectrum. So currently, if you ask me, if you ask me currently where we are standing with this, definitely we do have a lot more data structure than we had a six months back.

Q: Okay. And how do you think the company's response has been to these new digital tools and new initiatives taken to improve the digital tools?

A: I think it's very, very promising. The kinds of initiatives that we are presenting in for Have them. They are all really positive about it. And then I think the management has that vision that this is the way forward.

Q: Okay? And how are these solutions being rolled out from rebuild to its other countries at the customers?

A: we do have a very clear roadmap for 2022, where in how and when we are about to reach out to different markets and countries for the rest of the manlift. And manlift was the pilot country initially, so the two entities has already been taken care of. But the remaining around 10 plus countries in the in the world region, we do have a very clear cut roadmap for 2022. So it's been already scheduled and planned. And then we have we are going through that phase, taking a one major the major markets like Denmark, France, as an already been completed, Netherlands is about to happen within the couple of weeks' time. And then the remaining countries are lined up in kind of batches, small batches with the two countries together. So we do have a very clear cut roadmap in place, which has been already scheduled in the JIRA project as a project roadmap.

Q: Okay And what do you think are important topics are important factors that help develop different digital innovation projects?

A: we started very small initially, when we started building these in these kinds of solutions, digital solutions for the group, we started with a couple of developers, of course, the support from management, they have given full confidence in us that initially, we they have given some pilot projects for us to see if how effective our team is how effectively we can translate these business needs to effective solutions. And based on those outputs, they have given more trust to the team. And then the slowly we started increasing the capacity of the team. And then the now it become around 10 People will be working in the digital development solutions, both in the iOS, Android a bit of a mobile application phase and in the web application area. So yeah, of course, the support, the capacity, the planning. And in addition to that, again, as I mentioned that it clear cut definition of the responsibilities, who's going to take care of the demand side. And then again, that separation of that entire development, exercise into

demand and supply where in my team and me are mainly focusing on delivering things rather than getting involved with understanding and gathering business requirements. So I think it's a, it's a multitude of things, the support from the management, the capacity, the increased capacity, the quality of our team, I think we got one of the best teams in the in the entire IT department, I can proudly say that high performance team, the kind of organized way of working and then we have more embracing towards agile scrum methodology of working that will that definitely has introduced a lot of discipline within the team. So now we are much more agile, kind conventional way is to completely move away from the conventional way of software delivery from a waterfall methodology to more agile way of working. So we deliver incrementally. So it's a multitude of things that definitely helped us to improve.

Q: Okay, and another question is that, how does the organization respond to change?

A: Very open. Yeah, it's very often, in the sense that they are we always had a had a chance to raise our voices, we always given a chance to contribute in all possible ways. So it's been very often so they are very open to these kinds of affiliations and opinions.

Q: Did you face any kind of challenges when you were trying to develop these integration tools are when you tried to change the process from waterfall to Agile?

A: It was, of course, of course, it was not an easy, easy journey. Of course, these kinds of changes are very difficult to implement. In fact, to be really honest, we were not completely following your waterfall methodology. But again, it was kind of a mixed approach. Because initially when we started building a team of people, even though people I've recruited people from industry, leading companies and all, they were all black, practicing agile practices, but again, when I formed the team, it was when in the initial days, it was kind of a mixed work, or development methodology. We were falling, so we were not practicing it in the into the fullest way. But yeah, that that transition was a little difficult to pray to put all these processes in place and forcing everyone to follow in strictly. Yeah, it was it was difficult, but again, of course, now we are in a much, much better position now.

Q: Okay, and what do you think helped overcome these challenges? Do you think anything in particular, from your side from your teams and or from Riwal side and helped you overcome these challenges?

A: We had some training sessions in I should say, related to the agile scrum methodology. For the end, we do have a certified scrum master within our team. So it was fairly easy for me to ask him to because he's the scrum master. So he brought in a lot of discipline in that respect. So yeah, the support from the management, some trainings and then a qualified member within the team. These are all factors that helped us.

Q: Since this project deals with prioritizing different kinds of innovation projects within your team, how are different kinds of projects or tickets or features that need to be pushed into the solutions? Prioritize, like, is there a particular method where you prioritize

A: The prioritization basically, it's all as I said, it's a purely an Agile Scrum. Scrum is our methodology to practice this agile. So we have a scrum board. We use JIRA Agile Scrum board. To schedule our sprints, we usually have bi weekly sprints. So we are practicing the scrum, scrum methodology wherein we have sprint planning, Sprint, sprint review, Sprint, retrospective, etc. So the prioritization happens during the planning session. And the sole responsibility lies with the product owner of these respective projects, where you know, who's the one who's deciding the priority of which ticket to take care for the next sprint, so the sprint backlog and the priority of these tickets are decided by the product owner, not the development team. But again, from our side, what we does is we do estimations that is based

on that estimations, the product owner will get an idea how many of these tickets has to be can be taken care of in a single sprint, but again, the priority decision it's all with the product owner and that that is his decision is based on the continuous stakeholder interaction. And then the Yeah, so if the customer a customer is keen, in this case, the Emended when we talk about customers, in our case, the internal stakeholders, the personality from different countries. So those people are, I think, influencing that prioritization of the ticket, and it's the only with a product owner.

Q: Okay? Does your team interact with these customers of it? Or is it just a product owner usually interacting with the customers, even if it's with support or service?

A: Not 100%. It's a product owners interaction. But again, while during the sprint plan, review sessions, definitely all the stakeholders will and customers will be there and all those sessions. And we do we do have some catalysts, a minimal level of interactions, but on a majority of the time, it's all the product owner, we don't have to the customer doesn't have to directly come back to us as a development team.

Q: Okay. And what has the customer's response been to the solutions being provided by your team?

A: yeah, it's usually as I as I mentioned, there is no direct interaction, the interaction is very limited to none. The only area wherein we get a direct response from the customer is through while we go through the sprint planning review session, that is only what we call occasion wherein we will become directly in contact with the customers or the stakeholders. So otherwise, all these feedbacks are privately channeled to us through the product owner only. So we come to know okay, we release a new feature by the end of a particular sprint directly we will get an immediate response from them that hey, this is good or this is bad or this new changes etc. That is an area where we can construct similarly, we can get a feedback directly from Compton otherwise on in general, if there are suggestions, there are improvement ideas, all these things are all always coming through the product or not to us.

Q: Okay. And since this project again, is designing a process for prioritization of a portfolio, what do you think is lacking in the current process that needs to be incorporated in the new process?

A: I think that's a really interesting and then relevant question. And this I have, I wanted to have this kind of discussion with the rest of the team, not, not, I'm not talking about the development team, maybe for the demand side and the commercial innovation team, etc. One of the areas which I personally as a developer or the lead developer of the team, which I believe need, still, I know that there is a commercial innovation CIT team, they collect all these kinds of requirements, talking to different customers, and then a compiling a list of requirements, requirements and features and etc. And then they are the one who's responsible for prioritizing these kinds of feature request or user stories. And then based on that, the priority board will decide which project has priority, we need to have if that some new kind of solution or software has to be developed, definitely there, we have to have a business case prepared and then gives us full approval, etc., etc. So that process that is perfectly working fine. But still, if you particularly talk about my role as a customer facing big the biggest customer facing solution that we are currently handling and developing, maintaining and developing, I still think that the priorities of features that we are given to this particular platform is not so aggressive, in the sense that the our priorities are listed a little off. That is, again, as me as a developer, I may be completely wrong. But again, I think if there would have been a different maybe, I don't know if that has something to do with the process. Your question is particularly about is there any way that you will need a change in the process? But if we ask me the priority,

what we decide to go ahead with this project is slightly off, you know, you got what I'm trying to say. Yeah. So, we are not giving the right kind of priority to this one big project that we are giving Okay, now, we are developing a feature 123 are all prioritized. So, I think that that order of priority, we are going ahead with each and every feature has to be shuffled a little bit, that is my personal opinion. Or maybe I think my team also share that same kind of field we always discuss about it, are we giving the right kind of a priority to the right features as of now is this C or agile is all about delivering values, right? When we are developing an application Agile methodology is the very first thing is all about the kind of value we deliver through each and every increment or, or an iteration or a sprint, in the initial phases of any project, we will deliver high value solutions, or, or what we call the high value features or functionalities. And as the time passes, the value, the weightage of those values should be decreasing. So that means all the high priority or high value features and functionalities in a project should be delivered first. And then that that that itself shows that we have the prioritization of our tasks will be based on the value how much of a value I'm delivering. When I'm releasing a particular feature. Say for example, again, I'm giving you a feature or functionality to give notifications through the platform. Whenever there is an action happening in the platform. There should be a notification mechanism Yeah, it's a wonderful idea and it's a wonderful value addition to customers experience right any user use using a portal is a customer facing portal. So portal what is the meaning of a portal, a customer want to track all the activities that are the he is doing in the firewall or, or the automatic lifter portal environment. So that notification mechanism can be considered one of the high value feature that we can over on the other side, if we are focusing on an area where in sample something like a my projects, it's a different functionality that we are building. Only a handful of countries or companies or even customers are using that functionality in only one or two countries. But the kind of volume of the complexity of the scope and the time and effort we need to build that particular module is much huge than building a not vertical notification mechanism. So if you take these two particular these two different modules and compare their value delivery, of course I'll go with the first one. Yeah. Then the second one then this the second one even though the score Find the complexity is too big to develop that functionality, it's giving very little less value. So if you compare the value weight age of these two features, definitely the second one has to go way back into the priority list. Yeah, I still have a confusion whether are we giving the right kind of weight age to each feature or function? And are we delivering? Is it in the right order? It's I am no one to say, say anything on that front. But again, this is my personal opinion, I'm sharing with you. That's it. So there may be there is an area where still we can be there is a room for improvement in prioritizing the features

Q: Do you think anything is working really well. And the current process that should be carried forward to the new process?

A: its share of opening it is it is, of course, the way we are vertical or vertical gathering this information through the feedbacks, the interviews, the questionnaires, or face to face, meetings, etc., etc., and then compiling everything into a consolidated list of compilation of the requirements and then taking these things through some kind of a, what they call priority board meeting and then deciding which one to go that that kind of a process that we put in, definitely does commendable and it is working really well. The only area where I find a little bit of tweaking is required is the kind of ordering the ordering priorities of these particular features. But the way we collect all these information and compiling and then going through an approval mechanism. That is I think it's a full proof system we already have.

Q: Okay, and based on the question, so far, do you have any additional inputs to add that should be considered while designing the due process?

A: I can't think of any, maybe we should be introducing the concept of design thinking when we are implementing a new project. I'm not talking about any existing projects, if we are planning for a new project, any new digital solution that we are going to build from manlift, or revolve digital development team. I think this is the best practice. What this is one of the best things, which I think will add definitely add value to the development exercises. It's a design thinking process. I know I don't know whether you're familiar with the design thinking, workflow, gathering ideation, and then prototyping and then feedback etc. So there are five pillars in a design thinking methodology. So that that is that is what one thing which I really want to see in the future process. Okay, so if you want me to put it in a single sentence, I want to see a design thinking approach in any new project that we are going to build in the future.
Q: Okay, okay. Yeah, I get it. That brings us to the end of this interview. Thank you for the time and I will stop recording this interview right now. If you had any concerns about any of the questions or any concerns about this interview, you can address it to me after I press stop recording.

10.6 Interview with M1

Q: Perfect. So I'm going to start this interview now. Thank you for agreeing to be a part of this interview for the master thesis project titled, Process Design for Digital Innovation Portfolio Management. Please note that this interview is being recorded and the recorded audio will be used for transcripts for research purposes. I would also like to inform you that your personal data will be anonymized which means that you will not be identified by our name, but either be identified by your job role or your job responsibilities. The purpose of this interview is to gather insights and expertise on the various innovation activities and marketing activities in the rental equipment industry. Using the data collected through this interview, process structure and validation method would be designed to help develop an innovation portfolio management system for new projects. I shall now start asking you questions, please feel free to raise any concerns or questions during this session. Could you please introduce as to what you do at Riwal?
A: Yeah, sure. So, my role is marketing intelligence specialist. And I working in HQ. With HQ marketing team, which consists of two people. My responsibilities, let's say this, the main scope of my responsibilities is focused on the database marketing, we are using database to from Dun and Bradstreet, this is one of the largest supplier of commercial data in the world. And basically, my goal is to use this tool in order to create new opportunities for Riwal to get new customers. Okay. Besides that, yeah, I'm also helping with other marketing tasks like managing social media channels on HQ level and helping our team with different marketing activities like newsletters. Yeah, and other marketing things.
Q: Okay, and how closely are you aware of the progress of the digital innovation activities that's happening within Riwal with the customer base of Riwal?
A: That To be honest, I'm not a part of MyRiwal meetings. So basically, digital innovations, this is a part of innovations and big part of innovation. But yeah, for some reasons, I mean, for some activities, I need to know what is going on and where we are in terms of the progress. So yeah, I know, basically, what are the innovations to the platform or when we are going to launch? The platform, the new platform to countries?
Q: Okay, given that you've worked with a lot of data for commercial purposes, do you think that these new tools that the company is developing is helping and expanding the customer base?

A: I think it could be, because basically, rental companies offers the same thing, same machines, but I think having such tool as MyRiwal can be, let's say advantage for us compared to the competitors. And another thing, that now I believe that future will become more digital, to get all the information you needed via your phone or customer portal. Yeah, that makes the life of our customer much easier. So I would say, first of all, MyRiwal two, can we add like a retention tool of current customers? But can we also like argument like, this is a selling point for new customer.

Q: And do you think that Riwal is performing better than its competitors or in par with its competitors, as of now with all the different kinds of solutions not just digitally, but the rental services and everything combined?

A: I think it's highly depend on the Country in some countries, we are really very well present. Yeah, as in the Netherlands and some Nordic countries, we are performing very well. But in some other countries, I think the Riwal's position is not so good.

Q: Okay. Okay. And in your experience, the current process in terms of how projects are handled within the company? Do you think that it's going well? Or do you think there's room for improvement or if anything needs to be improved? Like, it can be any kind of project not just related to MyRiwal as of now?

A: Yeah, for MyRiwal, it's different to judge. If I can talk about marketing projects. I would say the main issue within the Riwal that maybe someone is in charge of project and for him, it's of course priority. But for other teams, they have other projects and other priorities. But to actually to succeed in project you need the support of other departments. And if for them, your project is not a priority, then of course, for you, it's very difficult to achieve something that would be good maybe to align maybe on upper level between different departments to set priority up. So then, let's say, we are sure that everyone would be focused on key projects for the company.

Q: And also, how do you think the company responds to initiatives?

A: The thing that Riwal, it's not really a centralized company, but really, I would say, more decentralized. So basically, it means that on the country level, you need to have people support to, let's say, promote some projects or innovations or things. So if you don't have a support from country manager, or let's say, managing global, then of course, it's very difficult.

Q: And how do you think it's been outside the organization?

A: I think if you talk about Riwal, we could take as a good example, MyRiwal platform, we can see that in some countries, the number of users is quite high. And at the same time, in some countries, it's very low. And I think that shows a picture that actually shows a reality that in some countries, it means that people were more interested in my I mean, like commercial people were more interested in promoting. By retail, too. I think it's always education, because if you have a great product, but you never tell your customer about this product, so of course they wouldn't use it. So I think you need to also spend a lot of efforts to explain what is your product is and why they need to use it. And only like that, they will start but if you just say nothing and you have it somewhere in the corner, so no one would use it.

Q: Given that marketing is a huge part of driving customers to being more active, using Riwal, tools and Riwal equipment while prioritizing projects. Do you know any important factors from a marketing perspective that discussions should be made on while thinking about developing new projects or by thinking about developing new solutions or rolling them out?

A: I think that this question would be better to ask [Redacted] because he is more in let's say aligning country marketing Team, let's say defining the strategy. But I would say there are some. As I said, it's my personal feeling that currently, we don't have one person marketing

person that would really make the decision for a company for all countries. What should be the priority for marketers? What happens? Sometime in the country, you can have only one person from marketing. And that actually combines a job with another role. Okay. So of course, if we talk about his priorities, those priorities comes from his country manager. And yeah, what is decided, basically, on the company level, we in marketing team, that wouldn't be so big priorities.

Q: And as an employee or Riwal, how do you think Riwal accepts change?

A: I can only take about my experience was my project. So when we started to work with DnB, it actually would have another, let's say, approach our commercial people doing Because currently, I have a feeling like they are more waiting for customers to come. So receiving requests, or just farming our current customers. But in terms of hunting new customers, I would say we are less performant. And in my project, when we would use a database to look for new customer interesting for us as segments, that means that our account managers needs to be proactive and try to contact, let's say, those companies to convert them to our customers. And I would see more resistance.

Q: Okay. And also, another thing that I would want to know is that from a perspective of reaching out to customers, what do you think is the most effective way to do so? Clarification - what do you think can be done to get them more engaged with the company?

A: Because we have different types of customers, we have small, occasional customers, and we have like big customers. And I think the motivations of those type of customers can be different. For instance, if we imagine just painter or I don't know, like, independent guy who needs a machine just to do his job. On the Job side, I believe that for him, it's very important to have like to rent a machine fast and have a good service, like working machine deliver it in time. And I think this kind of, let's say relationship can be set up on digital way. So I imagine he has his phone, he has a website, he just ordered the machine and his own, and he gets a confirmation and then the machine and time. So I think the future for those type of customers would be online. If you talk about like larger customer, then of course, let's say the personal touch is also very important, because they need more machines, they can have more specific requirements. Of course, it can be some problems. So it's very important that they reach to one person to resolve it. Okay. And also, we can talk about customers like [Redacted] that have a lot of entities. So also to have one single point of contact could be interesting for them.

Q: Do you have any additional inputs to add, especially when considering that a new process is being designed to help manage new projects and prioritize new projects at Riwal? Do you think anything should be taken from the current process that I should add to the new process?

A: Um, I don't know if it's also for MyRiwal, but I saw that you have like Project Manager. For some projects, we use a project management to JIRA very basically can allocate the task to involve parties and See already. So based on that to see a workload that should be done and yeah, plan, better plan stages of the project. So I think this is really good too. And time in other projects we are missing that. Yeah, so I think that I mean, project management skills in some for some projects are really missing for big projects.

Q: Okay. Thank you for your inputs. And this brings us to the end of the interview. Thank you for your time and I will now stop recording the interview. If you have any concerns of for any questions, or which we had so far, you can address it once I stop recording.

10.7 Interview with M2

Q: Thank you for agreeing to be a part of this interview for the master thesis project titled, process design for digital innovation portfolio management. Please note that this interview is being recorded and the recorded audio will be used for transcripts. I would also like to inform you that your personal data will be anonymized, which means you will not be identified by your name, but can be identified either by your job roles or responsibilities. The purpose of this interview is to gather your insights and expertise on the marketing of digital innovation activities at free will. Using the data collected through this interview, process structure and validation method would be designed to develop an innovation portfolio management system for new projects. I shall now start this interview, please feel free, free to raise any concerns or questions during the session. Could you please introduce yourself without using your name but telling me what you do Riwal?

A: Yes, I am the Marketing Manager for the while holding group 30% of my time and the other 70% of my time, I am the Marketing Manager for Riwal Benelux. So the Netherlands office.

Q: All right. And what do your job responsibilities include as a marketing manager at Riwal?

A: It's a very broad role. For headquarters, it's merely strategy, not so much operational or tactical. For the Netherlands, it's, it's also operational, so it's strategical tactical and operational. And it goes from multi digital marketing, which includes the website, SEO. So that's our Google position that's advertising, it's social media, it's video, photography, it's spiritual strategy. So it's marketing plans and setting KPIs and budgets, and it's very broad, very broad business.

Q: I can see that, yes. Do you have any experiences handling marketing aspects for the digital innovation tools that we will have such as the MyRiwal will and app and the website?

A: I'm also working with that. Yeah. The operational part is done by my colleague, mainly. I'm, I've not been involved in MyRiwal so much. So not, not from a marketing perspective, it's been handled actually, mainly by the MyRiwal team, which is two people here at the Netherlands. So that was my Netherlands role, mainly that I was involved in it. But the major part is done by the practical part is done by two other colleagues, and we take care of the introduction. So the launch of the MyRiwal 2.0. But it's very limited.

Q: All right. And from marketing perspective, what does the term innovation mean to you?

A: Well, there's a lot of opportunity for innovation, in marketing in within Riwal, what we lack here, we have a lot of systems, but they're not connected. So we don't have data flowing from, for example, our email marketing tool into CRM, and vice versa. Web visits are monitored in Google Analytics, but not also not connected to other systems. So we cannot follow our customers through the sales funnel, so to say, not properly, because they're all separate tools with separate dashboards. So it's very hard to set KPIs and to track the KPIs. So that's why we're working on a new website and a totally new ecosystem that connects those systems. So we can easily track and trace our clients throughout the sales funnel and also track the KPIs

Q: All right. And given that new innovation activities doesn't have to be digital, but there are several innovation activities that Riwal is rolling out from different teams. How are these innovation activities and processes managed from the marketing teams and if you're aware of it?

A: No, for the moment, I'm actually only aware of our same marketing projects. We do have contact with the priority board about them and we do of course have contact with digital

and IT, but I'm not really very well aware of Other projects, although I am aware that this ecosystem that we are striving to develop, of course, also interlinked with other departments. And there is another project, I believe on the way to create that that web app or that ecosystem, as we call it, to link all the systems, so there must be some form of communication. And there is a certain overlap, so that we need to get that going. But we've only just started our website project. So okay, it's very high on the list, we should have contacted all right line?

Q: And how do you think Riwal response is towards change? Do you think the company is very open to change? Or do you think they're still with traditional ideologies?

A: Let's say that Riwal is a very ambitious company. But we lack resources, it's really as simple as that we don't have enough people or money to roll out all the ambitious plans that we have. So currently, I would say we're behind in terms of marketing, at least, and in terms of it. MyRiwal well, really needed an upgrade, it's getting an upgrade. Still, I think there's there should be it well, there's a lot of room for improvement, and it should be faster. But we like the resources that we're website and the online ecosystem detail. It's really weird that we have several systems in place that are not communicating. So we can't really properly do our marketing. So we're Yeah, we're behind. I would say there's a lot of work to be done.

Q: All right. And what about process changes within the company? Do you think Riwal is open to having changes in terms of different processes or the way it handles things within the organization?

A: I think it really depends for country or even for depo. I think 70% of my time is of course for the Netherlands, so I'm quite comfortable with talking about the Netherlands. I think we're pretty okay with changes in theory, but in practice. While it Yeah, half of it doesn't happen. But that's also a resource thing, I suppose. I think at least we're very open to changes for the better. Okay, I must add the changes for the better. Because certain things, certain changes that we've recently had are not have not been for the better. Okay? All right. Talking about NetSuite particular. And we are facing some problems with the well, that date, I'm not going to say it's the data team, but we have some, it slash data related issues that are also caused mainly by lack of staff lack of resources, which is, has caused quite a few problems with the website. So that's where we lose business if the website's not ready, now run properly. And it's actually we have a lot of information disappearing because of some upgrade or, or new product import. And if you lose information from your website, pictures and data sheets, and whatever, and then that's Yeah, well, that's potentially harmful.

Q: Yeah. Also, keeping you're the marketing teams requirements in mind, whenever Riwal is prioritizing any kind of innovation. What do you think they should keep in mind? Keeping marketing perspectives like how would we how think how would we think easier for the marketing team? While Riwal planning out different sorts of innovation activities?

A: Will it make innovation in general even or innovation, marketing wise can build campaigns for just about anything, of course, although it's harder if the systems aren't working properly and not connected. But of course, it really has to add value, and sometimes we have a tendency to launch or promote something that really isn't an innovation. In Well, yeah, in my perspective, or our perspective, or, I would say the customer's perspective, for example, MyRiwal on 2.0 Compared to 1.0, which was, is being intensively used in the Netherlands, is not really an improvement. It's the features are not are quite similar, at least on the front end. And on the in the back end, it's probably better, but the customer won't really know. So for me or for marketing, it's kind of hard to promote something that requires actually deleting your current app and downloading a new app, instead of just doing an update on an app, we have to get

customers to delete the old one, download the new one, log on to the new MyRiwal environment, and then say it's major innovation. Technically, I mean, front end, there's hardly any change for the customer. If it's really, yeah, I mean, any other company would just not even introduce it, but let it get updated of launch and just yet do an update. And that's it. We're actually making this a whole launch blah, blah, because people need to actually download that new app. Yeah. So that's, I think that's, yeah. Harmful, at least for us. marketeers is harmful for the business. I see. That's also I think that's also has to do with the fact that we develop stuff in house, and we are not an IT company, or an AW, P those companies. But sometimes we pretend that we're an IT company. And I'm not, you know, it's not an attack on anybody in the IT department. But let's not pretend that we are an IT company, and we have all the expertise. There's a lot of extra companies build apps that could have probably done an equal or maybe a better job.

Q: Yeah, I understand that. You've also answered partially, my second question, what do you think are the challenges for rolling out these integrations through the marketing perspective? But do you think of any more challenges that could be hindering you from rolling out these or launching these new innovation activities?

A: IT/ slash data team, which is also understaffed, and we need them quite frequently. And I must say that marketing has not, I mean, we're, I'm not going to say we're understaffed, but we could do with more people. So we, we can't really do as much as we would like to do. All right. But I think there's we're trying what we're trying to do is create more, let's say a templates for campaigns, etc. And we've got a set of new tools. But we just need to centralize that from HQ, which is currently actually, most marketing innovations come from several countries and the roles are locally and then copied onto other countries. Whereas headquarters should have a leading role there. Which unfortunately, is not the case because HQ marketing is, is really understaffed. Okay, yeah. And the more strategical, yeah, activity should be done from HQ, and more, let's say, stuff that has global impact. So winning website, but also project photography, client testimonials, social media campaigns, not necessarily, but if we have, if we can create templates and examples and help the countries on the way that would seriously help.

Q: I see your point. Talking about starting campaigns or launching campaigns in different countries? Do they usually have almost the same outline? But ideally, are they the same for all the Riwal countries? Are they different or closely cater to each country?

A: No, they're actually all different. I think everybody has their own approach. That's because we lack any centralization and standardization. But, for example, the miry 1.0 launch, we are using the tools that Denmark who came first is also using France came next. So the Netherlands are copying, let's say the best practices of the other countries. we're copying the certain elements of their campaign. However, there's also locally that there's always localization and yes, can you say that we focus on on our own country and our own culture? For example, France has a very non digital population still. So they really do less to drive people to my year 2.0, then we will do in the Netherlands because the French simply or are less eager to use an app or the desktop version, but they're not mobile friendly. So to say, the French, not early adopters, we on the other hand in the Netherlands would push people towards manual 2.0 As much as we can to unburden our rental desk. So but it's okay in the Netherlands, it's, it's well accepted to to use an app. So there's certainly cultural differences. There's also differences in terms of the number of staff that we have available in the Netherlands we have about 1.5, full timer. For example, in our in the Balkans, or Eastern European countries, or Central European countries like Slovenia, Croatia, they have people that do marketing on the side. So they just lack the capacity to roll out any proper campaigns. They just try to keep all the balls going so

to say, okay,

Q: so would you say that in terms of being early adopters, the Benelux region is usually the ones adopting any kinds of innovation first are more accepting towards innovation?

A: the Netherlands together Denmark, France, to somewhat lesser extent, when it comes to digital stuff, but they are also front runners in terms of marketing. And of course, our manlift countries, okay, are very, also very digitally. Innovative.

Q: All right. And also do the account managers and country managers play a role in the marketing campaign?

A: Not really, not the MyRiwal campaign, for example, but we do liaised with other campaigns. Okay, because yeah, they're usually a joint effort of marketing and, and sales, or Yeah, the commercial sites.

Q: All right now, well, since this project involves designing a new process for innovation portfolio management. Do you think that there's something that needs to be changed from the HQ perspective when they decide what kind of innovation needs to be rolled out and how it needs to be rolled out?

A: I think centralized certain centralized work would certainly help the country's rolling out. But you don't want to over centralized because it still has to fit each country. So what works for the Netherlands? Probably what will not work for Kazakhstan, okay, because of cultural differences because of resources available because of, let's say, the level of maturity, marketing wise as well. So you need to give them handles, but not push through final solution, because that won't that won't work for the Kazakhstan's in the Slovenia's for example.

Q: Okay. All right. I understand that. That almost brings us to the end of the interview, but based on the questions so far, do you have any additional inputs that I you think I should consider while thinking about Riwal as an organization while trying to design a process for Riwal itself?

A: I'm trying to bring structure which was lacking when I came here. So structures a good thing and matching ambitions with resources or rather, ideally, remain the ambition or keep the ambitions at the same level but increase the resources but I know that increasing resources requires certain full turnover etc. So yeah, yeah, we need to step up our game but if for example, we link our systems, we can much easier track our clients in the sales funnel and we can easily we have a lot of advantage driving them through the sales funnel. So yeah, if the systems get better, we will get better marketing will get better sales will get better revenue. You, and then we can grow. Alright, but for the time being, yeah, match the ambitious with the, with the resources definitely yeah, yep. Yep,

Q: that's actually a very good insight that nobody so far has provided, which I think is important as you're trying to develop innovation activities that don't match with your resources.

A: No. And there's another one because, for example, we had to hand in a business case for the website. And we handed it in it was a two slide PowerPoint template that we filled in. And then we were asked by a fine finance manager in HQ to also build a what was it feasibility study, yet, they had to provide a feasibility study and some other report or study or proposal when everything was already in the two slider. So that's actually when we said we're not going to write a feasibility study because everything you need to know is in that two slide document. So don't over know that don't get too corporate and over organized and over document and over process, you know, it's all process and protocols and blah, blah, it's not hands on. Riwal HQ is not hands on at all. They don't have a clue what's going on in the country. So that's what has become really clear of me doing this dual role. I guess some people in HQ hard even

though what a and a WP looks like. And when you when you work here in the Netherlands office where I am right now. It's really it's all teamwork. We all do it together. Whereas an HQ it's more, this is my responsibility than that's not my aim. They shove off responsibility that isn't theirs. Well, yeah, it should be more teamwork. Yeah. Watching work. Yeah, it's a joint effort to improve. We can we can really get further if we work together. Yeah. Yeah. You know, asking people to write feasibility studies that you can just chew on and say, No, I'm not going to give you the money. When it's already clear from the business case that it's a very feasible thing to do. For your personal Yeah, that's not an analysis over. I call it documented. It's not Yeah, that's not that's not move paper around when we can just be very pragmatic. And just go ahead and do it because we already know what's going to work.

Q: Yep, yep. Yep. This brings us to the end of the interview. Thank you for your time, and I will stop recording the interview right now. If you have any concerns or questions that you had during the interview, you can ask it to me as soon as we're done as soon as I stop recording.

10.8 Interview with M3

Q: Okay, perfect. Thank you for agreeing to be a part of this interview for the master thesis project titled as process design for digital innovation portfolio management. Please note that this interview is being recorded and the recorded audio would be used to generate transcript for research purposes. I would also like to inform you that your personal data will be pseudo anonymized, which means that you will not be identified by your name, but will be identified either by your job role or your responsibilities. The purpose interview is to gather your insights and expertise on the marketing aspects of digital innovation activities in the rental equipment industry. Using the data collected through this interview approach, the structure and validation method would be designed to help the intern to develop an innovation portfolio management system for new projects. Please feel free to raise any concerns or questions during the session. Could you please introduce yourself with your job responsibilities or roles that you carry out at Riwal?

A: Yeah, sure. So I'm responsible for the marketing communication at HQ, mainly coordinating and facilitating the local countries in doing they're executing their marketing and communication activities to inform the internal communication and to sell Riwal as a as a solution for working with clients.

Q: All right. And do you have any experience with marketing digital innovation tools that are being developed at Riwal

A: Yeah, so they are the tools, not sure of tools, but the materials that we that we create. So over the course of many years, what we do is we generate materials for the tools that we generated in the let's say, digital and digital department, try to sell that trying to make sure that the personas or the customers understand the added value, and that they understand what kind of solutions can we provide through the platforms through the tools that we are creating? But also, of course, the let's say, the more hardware parts, the machines, what can machines do? What can they not do? How high can they reach? What are the use cases? Which industries? might they be used? And basically inspiring our potential customers to also notify them? What's in it for them? And how we can help them on the job to be done at night.

Q: All right. And what does the term innovation mean to you? While you were working at Riwal?

A: Well when working with Riwal, mainly providing a solution in any field that wasn't there

before. And that is now available for customers.

Q: All right. And how do you think the customers or the industry's reception has been to these new digital innovation or digital transformation activities being carried out by Riwal?

A: Depending a bit on the customer, of course, but I think I think they perceive it as a very welcome, welcome addition to the services that we provide. I think they recognize it partly from their b2c experience with other companies. I think to some extent, the there actually helps to carry out their jobs and make it easier for them. And yes.

Q: Thank you, and what kind of processes are there in place? Currently, at Riwal to prioritize different forms of innovation., what kind of processes do you think Riwal currently has within the organization?

A: Yeah, so there's a few elements that are making those decisions, I would say, very high over I think it's management's together with some people in the business are determining which projects are most relevant and most important for the company as a whole. Also, taking into consideration what is the strategy and what is the need, maybe over the mid and long term. And on top of that, we have the so called product owners. So we have a product owner for MyRiwal product owner for the website, for instance, a product owners for other contexts. Some projects as well, were in the ends, at least on paper responsible for what? Tickets or let's say minor adjustments or bigger adjustments in the ends will be developed first. So they are pre prioritizing the way we develop, and the way we be, become more innovative. So that's just pretty much it. I think there's a clear line. High over management, in collaboration with the customer innovation team, and a more detailed level, that's the product owner.

Q: Okay. And how does your organization respond to change? Is it more accepting? Or is it more rigid? Or is it somewhere in between in terms of accepting new changes in its structure and its processes on its way of operation?

A: I think organization here itself as same as the industry actually is pretty conservative. So changes is something that is sometimes difficult to manage. And also not always very well accepted, I would say. You see that mainly, in the commercial sides, sometimes they are not willing to sell the innovations or maybe not seeing the added value for customers. Although, again, as mentioned, a lot of those innovations are actually coming from the b2c kind of environments, already proven their value in the in the customer sector. So I think that sense to the mind set needs to needs to be a little bit more open to those kind of changes. Or the other on the other hand, we do have in our DNA that Riwal DNA, you can say in a culture here, a mindset of continuous improvement, where we strive to, to improve the processes that we have, what processes improving processes and rebuilding being innovative are two different things. And I think that's where we can improve the innovation part.

Q: All right. And in terms of marketing itself, what do you think are important resources are important factors that the marketing team needs to know or needs to have, before rolling out solutions, innovative solutions to different Riwal partners, or even countries?

A: Yeah, so for marketing, you always sort of a balancing between the internal organization and the external world towards the customers. So we need to really identify the needs of the customers and make very clear translation. What is in it for the customer? This is your need, for instance, and we can translate that into a feature which brings a solution for the customers. And that is part partly also the task of the of the marketing team, how do we spin this? How do we how can we use a certain solution and bring it to our customers as being then also seen as an added value for them? At the same time, I think is really important that we as a marketing team and a communication team also influence the internal organization making sure that they

are moving at the same pace as the rest of the organization. And therefore also embracing the new innovations that we have, and also embracing the maybe new way of working or embracing the solutions that we can provide to our customers so that they can eventually sell it to the customers. And that's really important.

Q: All right. And given that marketing has to be connected with different departments to scale out or rollout innovations to promote them within the customers. Do you think that within Riwal the marketing team is highly interdisciplinary with the other teams working or operating from different countries or within the HQ itself?

A: Yeah, okay. I think the position of the marketing team and the Riwal is not where per say should be, I think, what you see in more innovative companies and bigger innovative companies, which are actually very profitable that marketing is more as a more centralized role. And I feel sometimes Riwal marketing is more of a supporting role and with debts, you'll see that it's more reactive. And that's the commercial teams. That can be account managers, but it can also be the rental desk, for instance, they are coming up with needs saying, Okay, we need this, we need that we need XYZ in order to inform our customers or maybe sell a certain product. Where in other countries you see it's, it's the other way around. So where are we marketing team is discovering the needs of the customers, where they are communicating about those solutions that we can provide and where they then generate leads. And the leads are being followed up by commercial teams. Right. That's a that's a position of the marketing team, which, which is in that sense, for a marketeer at least is not ideal? Because you're more in a reactive kind of way? Working? I think and yes, I think if we are conducting a more structured market research, what are the needs? How can we help customers? Let's then also create the materials to communicate that to the customers it can be. It can become more, more efficient.

Q:Do you think Riwal as a customer centric company?

A: I think sometimes we are, I think some account managers, they are very customer centric. Technical team can be very customer centric. I think as a company as a whole, I don't think we're customer centric. Okay. Because we are quite reactive. And we're pretty much looking at ourselves. As then how can we optimize the processes the internal processes? Can we make it easier? internally? How can we be more efficient? Sometimes we're not always thinking, from the customer's perspective, how can we make it easier for the customer?

Q: What do you think should be important factors from a marketing perspective that should be considered while prioritizing different kinds of innovations or different kinds of solutions?

A: I think the impacts basically let customer centric I think is really interesting. And I think for a mark to add a customer centric approach is very important. Why is that because being customer centric also means putting the needs of the customers first. And if you put the needs of the customers first, you're therefore discovering, I in essence, you're discovering the added value for the customer, how can you bring added value to the to the customers if you really bring added value to the customer? If you if you deliver them solutions that they need to perform better, it's quite easy to market it. All right. I think that makes total sense for a marketeer and to really work at a customer centric company, because the solutions are easy to sell. And it's something that the customers should need at least

Q: That makes complete sense to me. Also, given that you have a current process, where people are evaluating different innovation activities within Riwal, what do you think is lacking in the current process that should be considered the new process?

A: Again, I think what we need is a mindset shift from looking internally and improving the

internal processes to more focus on the on the customers and say, Okay, what can we do in order to make it easier and better for our customers? I think that's a major mindset shift. Where a lot of training comes in. And we're also big change comes in in terms of how do we approach our customers? What do we what can we what can we provide to them maybe what is the price? What is the way they handle their, their machines there invoices, and everything basically, I think the process should be really focused on make it easy and adding value. I think that As easy as that, but sometimes if you're being a very, very long time, you've been a more company that is reactive, as part of a luxurious position think that Riwal has been in for the last 30 years, 20 years, work came to us people came to us. Competition was alright. But what we see last couple of three to five years, there's more competition, it's less work coming in margins are on the pressure. So we need to be more innovative, we need to be more customer centric, and we need to really put the customer in first place.

Q: All right. And what do you think is working really well with the current process that needs to be carried forward to the new process? Because sometimes things really work out well, in the current process that should be also considered for the new process.

A: By optimizing your own internal processes, of course, you need to keep it because it's, it's minimizing the waste, as in being more effective and efficient inside, in suddenly, in the organization, making sure that your machines are always in order. I think that's a great process that we have in place will definitely not change it. Yeah, I would, I would, I would add a layer on top of that in the mindset that the customer always comes first, we always should focus on the needs of the customer. I mean, just making it easy for them. That's, that's easy. Yes, I can I can bring it to you.

Q: Yep. That almost brings us to the end of the interview. But based on the question so far, do you have any further questions or any additional inputs that I need to consider while developing my thesis or something that I probably should be looking into?

A: What might be interesting is looking at the competition a little bit and also taking into consideration what is the history? Why became the company as it is today? How did they get there? What is the Riwal way? Exactly? When is it implemented? How is it implemented? How can you implement a mindset change a shift there? How can we how can we basically make sure that with the same people, more or less, we change the mindsets and we become a company that is internally focused to a company that is externally focused.

Q: All right, and thank you for your inputs. This brings us to the end of the interview. And thank you for your time. I will now stop recording of this interview and if you have any concerns or questions based on this interview, you can raise them once I stopped recording

10.9 Interview with X1

Q: All right, yes. Yeah, I see you this Well, thank you for agreeing to be a part of this interview for the master thesis project titled process designed for digital innovation portfolio management. Please note that this interview is being recorded and the recorded audio will be used for transcripts for research purposes. I would also like to inform you that your personal data will be anonymized, which means that you will not be identified by your name. But there is a possibility of you being identified either by your job role or your responsibilities. The purpose of this interview is to gather your insights on the digital innovation activities, therapy

rolled out by river, using the data collected through this interview, a process structure and a validation method will be designed for the will to help with an integration portfolio management system. Actually, now begin with the interview, please feel free to raise any concerns or questions during the session as well. Could you please introduce yourself as to what you do at Riwal or what you do for Riwal?
A: Yes. Okay. Yeah, my name is [Redacted], I am now working at Riwal for more than five years. And I started as an account manager in in the middle of the Netherlands. And now the last two years, I am Key Account Manager in a key account team with three other colleagues. And we are helping the top 20 For customers of Riwal in the most way of working with our aerial platforms, and digital solutions, and innovations and everything what it what, more Yes.
Q: That sounds good. And in general, what do you think the term innovation means to you?
A: Yes, innovation is for me, with the customer, helping the customer with his needs. And we also do that with our customers with my reward, and when I started reward, my reward card came very quickly in my conversations with these customers. And I, we give insights into where the machines are aware and, and how they are used. And that, that that means that the customers therefore the customers wants that data. And so that's innovations to help the customers to work in a safe way at height.
Q: All right, that sounds good. And how do you think from your end as a key account manager, are these innovation activities being handled at Riwal? Like what happens once for example, the team has an innovation like say MyRiwal, how do the key account managers get involved with it?
A: So, the way we involve it is was we get this information of MyRiwal and in turn what I do with MyRiwal is that I was in the beginning or enforced of MyRiwal and so I so just a moment or because of is of this interest of MyRiwal, I have always been involved in the further development of this tool. We will continue to this development these two together with our customers and okay. That's
Q: okay, that's nice to know. And how do you think the customers or the clients have responded to MyRiwal? Do they like it? They use it frequently? Or are they very, not very responsive to this tool?
A: Yes, I'm maybe I must give an example of how I do it with my customers. Maybe perhaps some nice examples a customer of mine, you also have his owns owner aerial platform. So and you will and how, how nice would it be if he also gets all the data from this in MyRiwal? And at the moment this is not yet possible but the data is retrieved from track unit, but this gives him an overview of how where how where the machine are located it could end Yes. And in addition, we are doing in figure in project in [redacted], also on the university, new building for the faculty of science and engineering. And there we have an example. Currently, we have the 80 machines there, which are activate, and they activate by best. And you want to confirm that with my reward. And that's why the customers is involved with us to do this on this site.
Q: Yeah. That's, that's nice. That's actually pretty nice to know, as well. And do you think that Riwal as a company is very open to new ideas and new innovative activities? Or do you think that they're still very traditional, and they're very closed off, and they like to operate in a very fixed systematic way.
A: Now, we are very open in that. And so they give them the space also, for me, but also to our colleagues are very, to get that innovate and get to get a need, what the customers want. And so we are therefore they love for me, sorry. We are this. So we are the customers knows that we will is one of the suppliers, who thinks a lot of innovations.
Q: Okay. That's good to know. And since you also work very closely with the

customers, do you think that the will in terms of digital solutions is better than the competitors that we have right now? Like, are we doing better than our competitors?
A: Yeah, I, our customers, I want to see it from us, our sites and our other suppliers. Yeah, they are also being this doing this. But we are focused on what we are, what we can and what we don't get where we don't. We don't. Yeah. And that's, that's, I think, our power.
Q: Okay. That's nice. And do you think that there are any challenges with MyRiwal, like something that's not working right? For the customers? Do you think there's something that can be improved about my reveal itself?
A: Yeah, there are a lot of challenges we have to do with MyRiwal. And example, what I just told was the own machines from the customers into my repo, so they can get also the data from his own machines, but also to give an A major installing, and I don't want more function to get to do some more function for him out for my reward. So our technical people write MyRiwal repo gets the information from MyRiwal from the more function so we can get faster to the client.
Q: All right. All right. That's nice. And what do you think is something that's really nice about the platform that our customers really like? Like, what do you think is our best feature in MyRiwal?
A: us also many things, but the rapid the co2, co2, and the bream reputation is thinking one of the best what we have now, because the biggest customers wants to get data from how the machines are working. And, yeah.
Q: And do you think as an account manager that would you want to be a part of discussions where they talk about implementing new features?
A: Yes, it's two things, I think it can be better. But many of my colleagues are in discussions with clients, with our customers, and we are going we are getting the space to get more.
Q: Okay. Okay, that's nice. And do you also think that apart from Riwal will, will our customers be open to more new digital solutions? Rather than just more machines? The fleet or more rental options? Do you think if we provide more software based solutions to our customers? Would they be interested in that?
A: Also? Yeah. Maybe I think, all the I think we have to go for one portals. What we have to what I see by customers is that they always say, we have all already many apps for everything. And now is MyRiwal also an app. They want to use one, one app? Yeah. Okay.
Q: All right. And what else do you think should reveal as an organization considered when they're making changes in the app, like MyRiwal? Will itself whenever they're making changes, what do you think we will should consider before making any changes apart from customers or clients?
A: Now we can do more interactive in the in the portal in MyRiwal. So give them more information about the weather, about safety, about what's going on? What has with the rental machines?
Q: Okay, that's, that's really nice. That's basically most of the questions that I had. Do you think that you have any additional inputs? Like do you have any additional points that I should consider while thinking about improving innovation at Riwal according to you, anything about your opinions?
A: Innovation, we are with many things visually and that's that that are separate from MyRiwal. So I don't know if that is that relevant, yeah, it is relevant. So, we have we are we have two when I started Riwal I was with the pipe carriers. So how can we help the customers to get his pipes from sprinkler to get safety at height? So we innovate the pipe carrier. And now they are in our questions about how they can do it with forecasts to get the pipes to hide heavy, heavy,

heavy pipes. So also there we are involved with the customer to look for a solution.

11 Appendix B

11.1 Training Module for Process Framework and Scoring System

This section comprises of all the slides used in the training workshop for using the weighted score sheet.

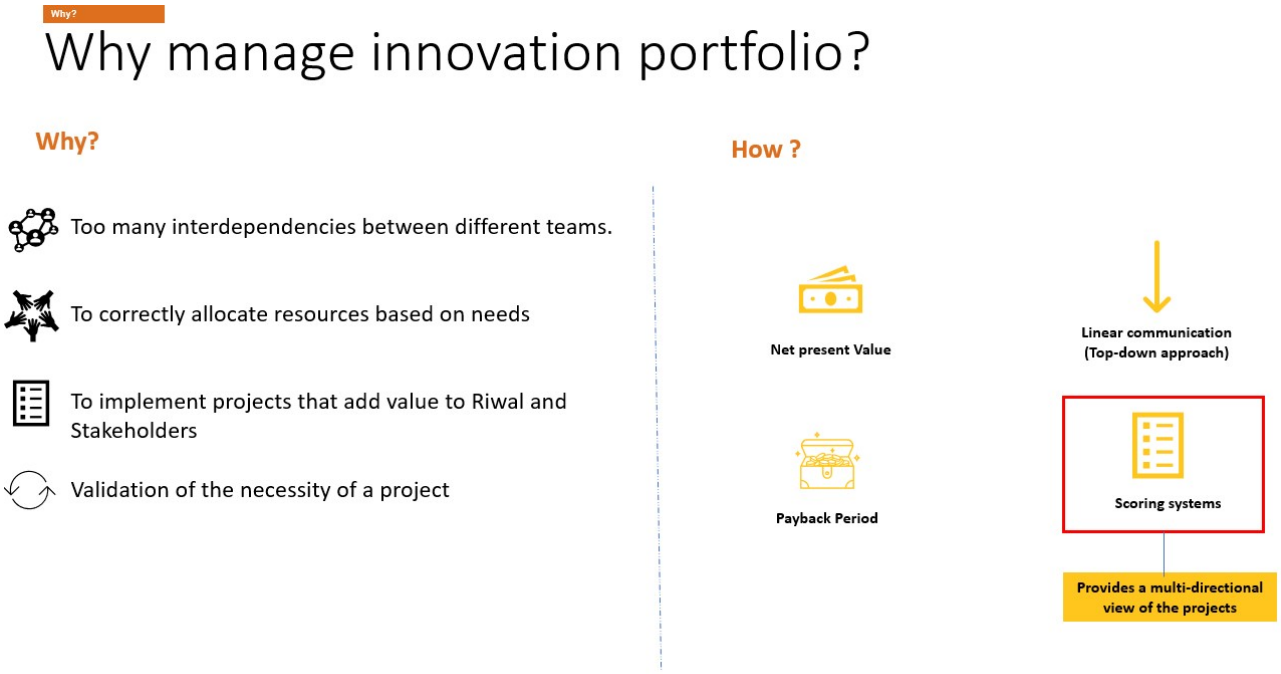

Figure 19: Introduction Slide for the Training

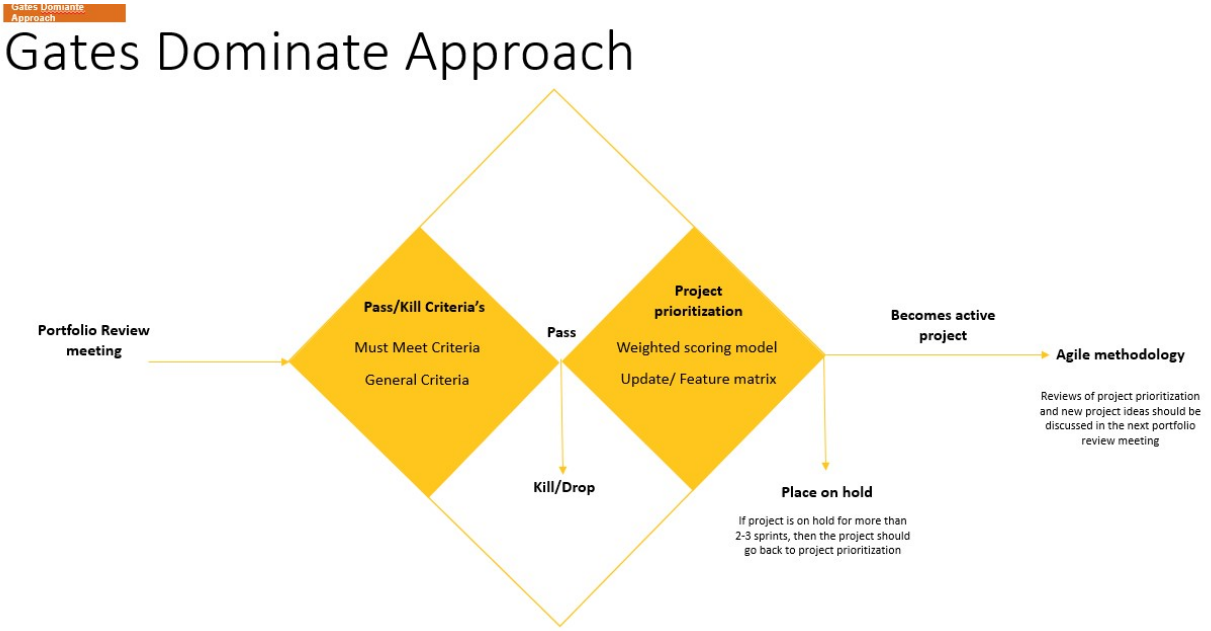

Figure 20: Gates Dominate Approach

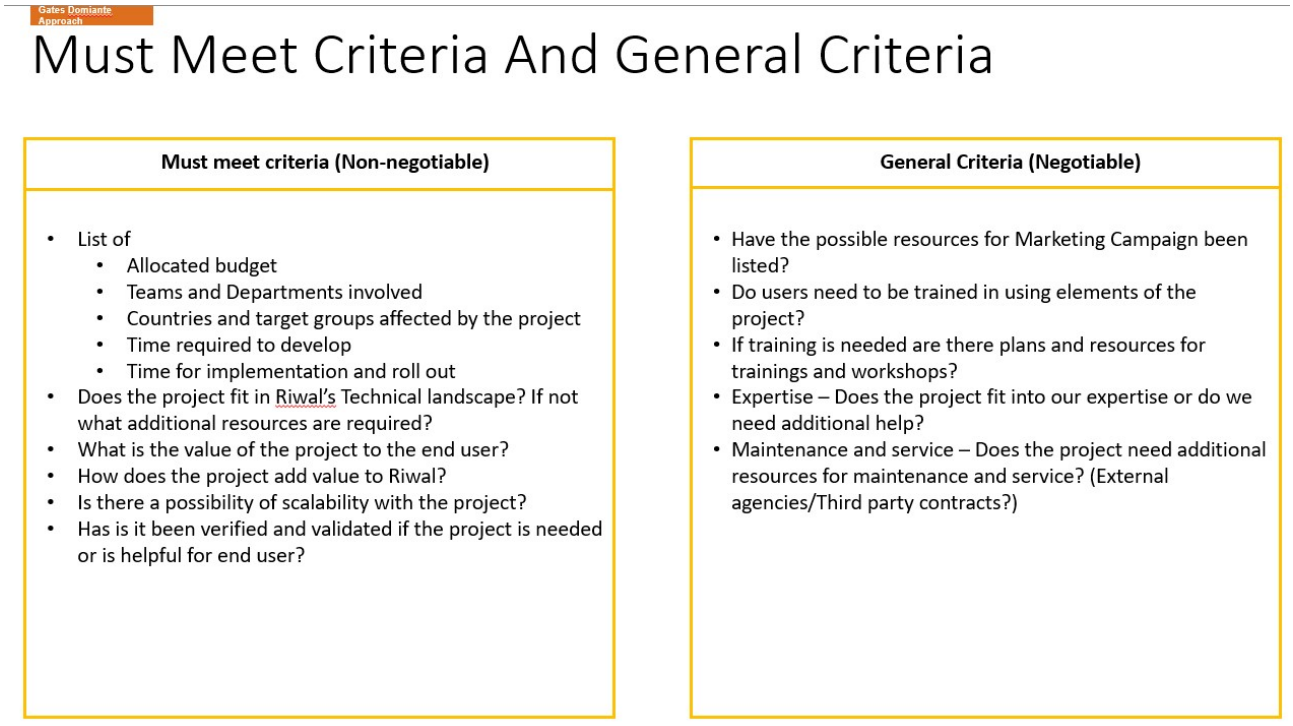

Figure 21: Must Meet Criteria and General Criteria

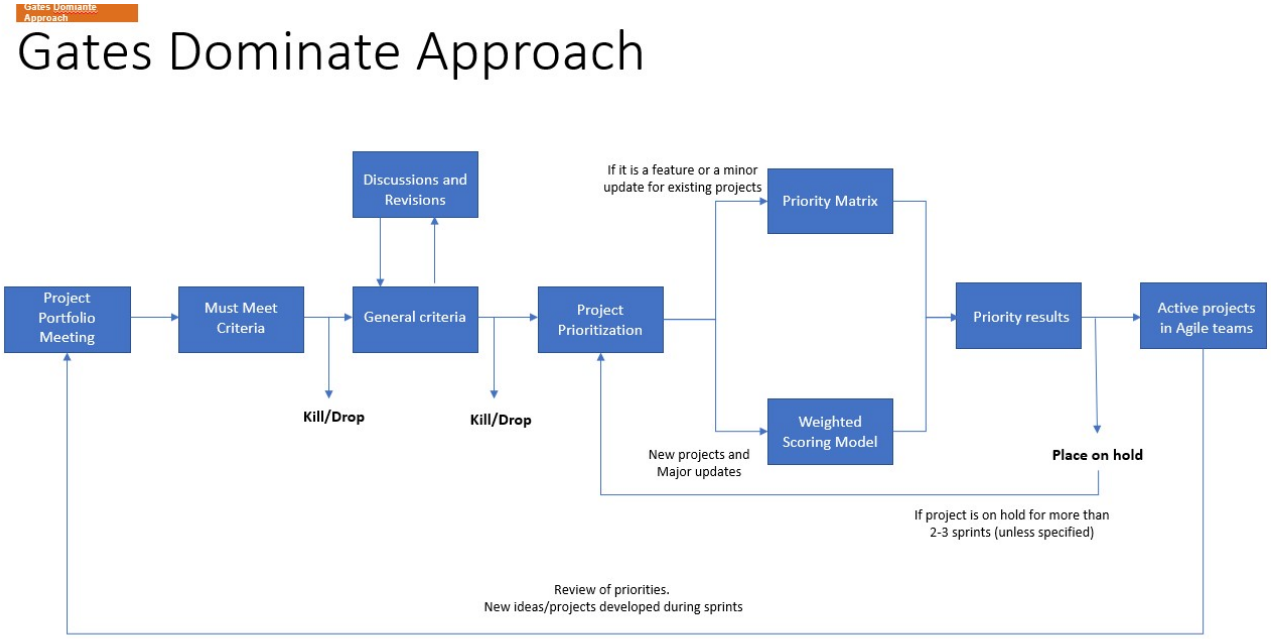

Figure 22: A detailed view of gates dominate approach

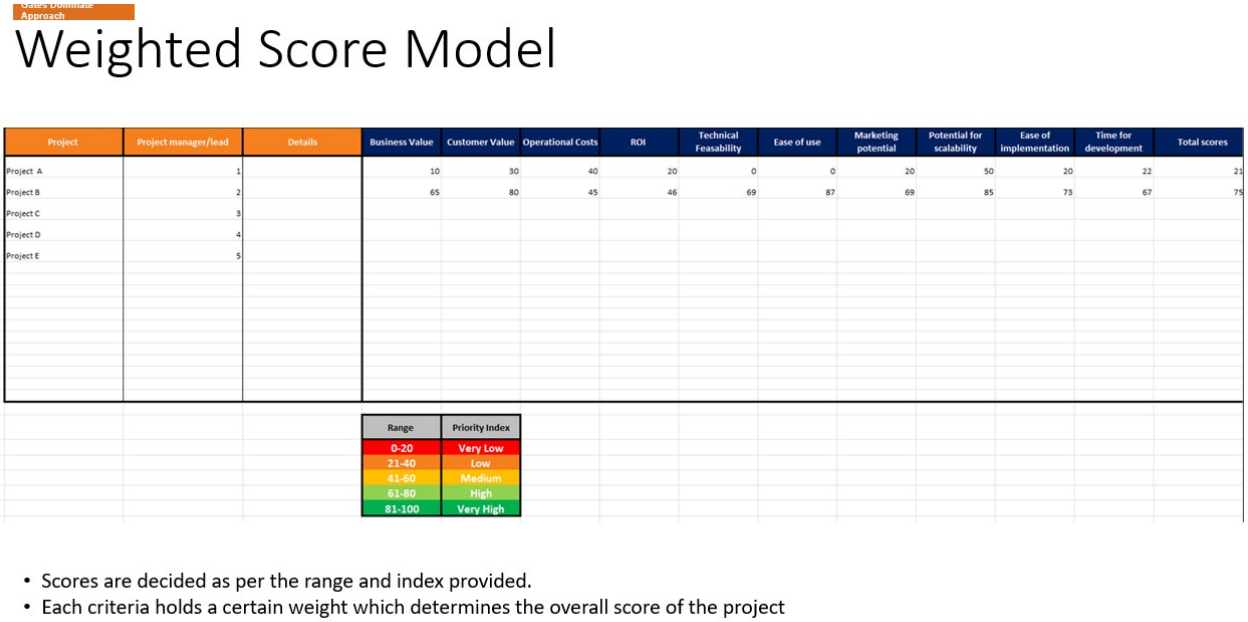

Figure 23: Weighted scoring model

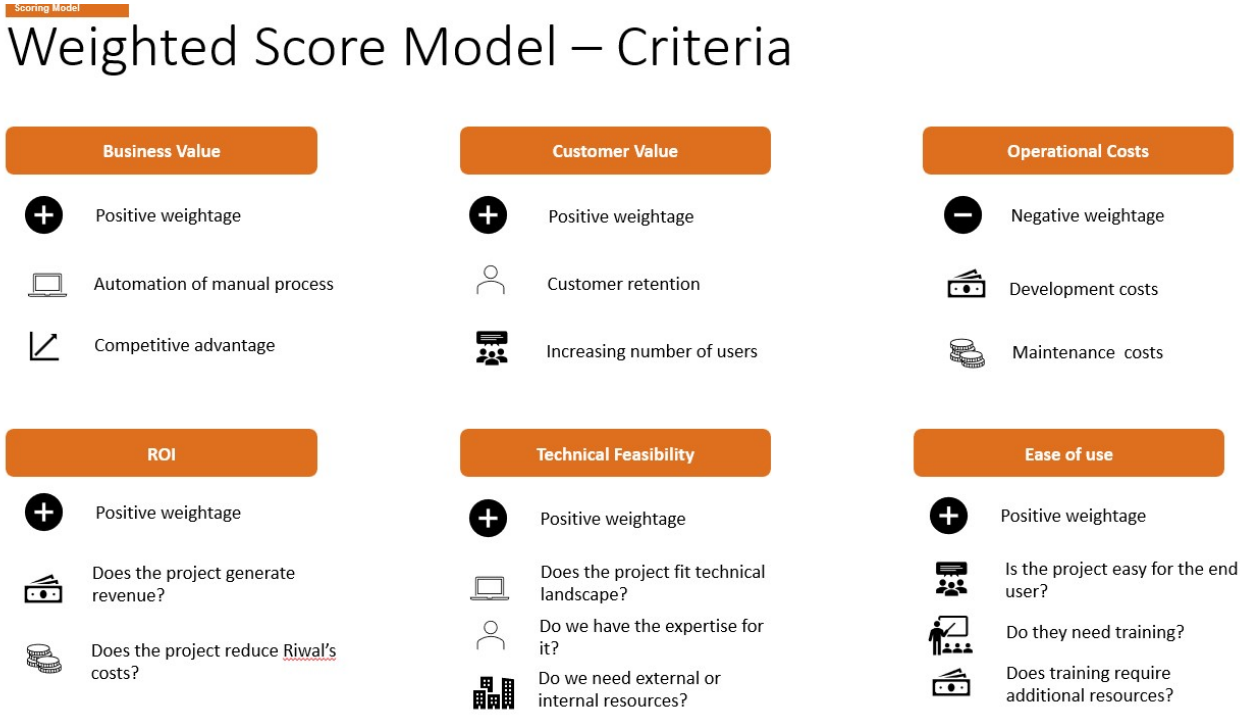

Figure 24: Criteria within the scoring model

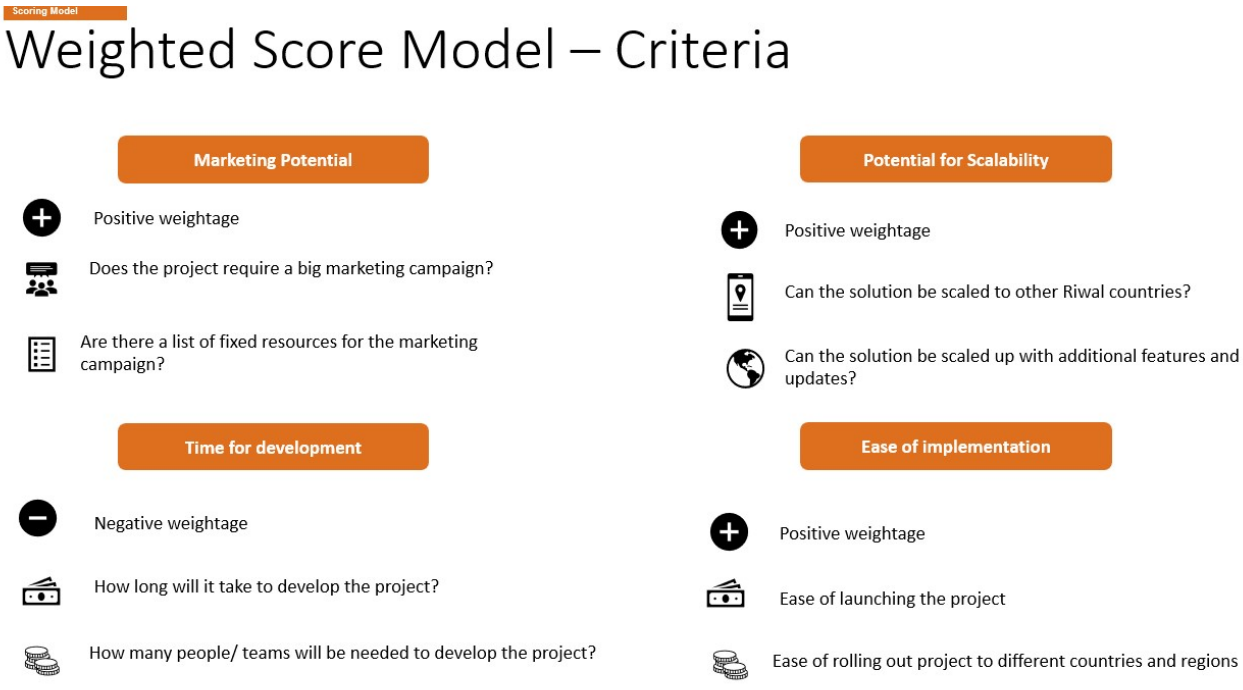

Figure 25: Criteria within the scoring model

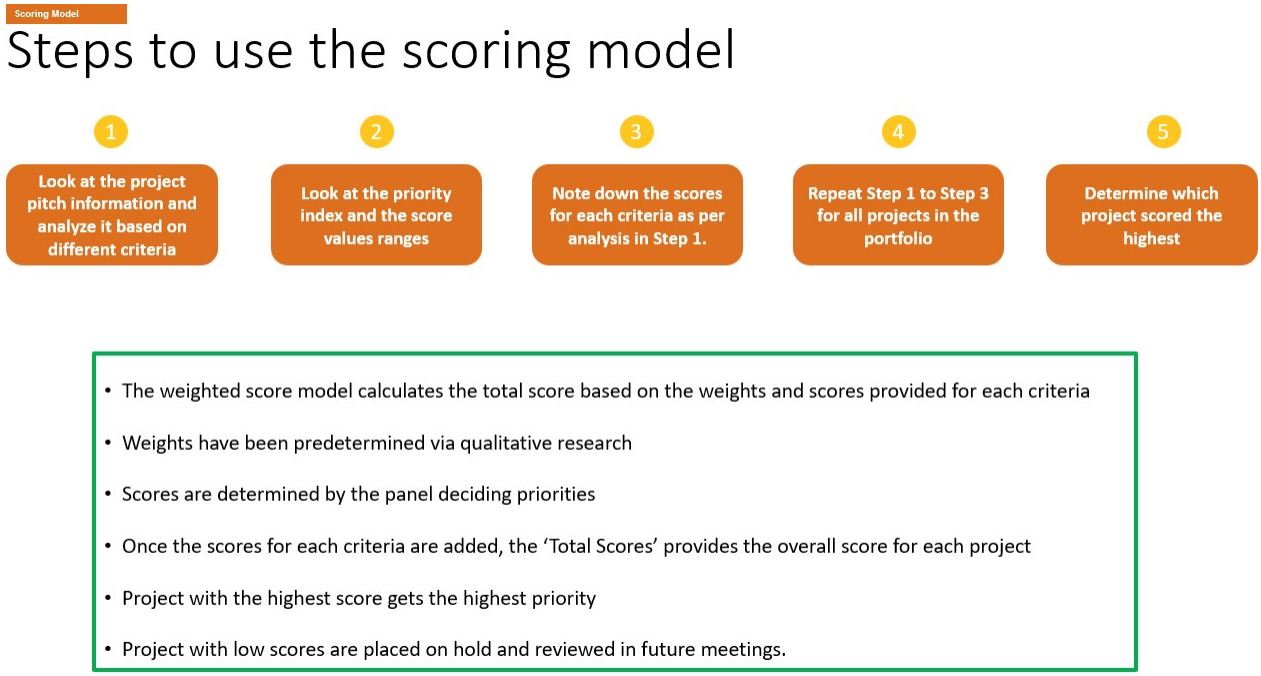

Figure 26: Steps to use the model

11.2 Score sheets of participants

Below are the score-sheets obtained from the testing of the scoring system. At the time of writing this report, only 4 out of 8 participants of the workshop provided their scoresheets.

Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he has to pay more.	95	85	84	85	87	95	95	65	75	45	86.35
Ask for feedback after off-renting a machine / closing off a rental	90	90	75	92	70	90	65	80	90	90	83.35
Show 'third party' and competitor machines / allow the user to add these machines manually to have an overview of the total amount of machines on site	95	95	97	95	72	85	91	85	85	85	88.05
Communicate damages and breakdowns via pictures and video calls (with the technical support desk)	95	95	91	90	95	95	99	89	78	90	92.7
Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type	90	90	90	90	91	100	98	90	91	99	91.1
Offer digital training exercises which explain how to use the machine (e.g. tutorials, playful exams, VR, etc.)	91	91	80	80	90	90	100	80	90	90	89.45

Figure 27: Filled score-sheet 1

Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he has to pay more.	60	90	30	80	65	70	85	65	65	40	70
Ask for feedback after off-renting a machine / closing off a rental	45	65	20	45	75	80	70	80	60	50	68.25
Show 'third party' and competitor machines / allow the user to add these machines manually to have an overview of the total amount of machines on site	80	75	70	75	50	65	70	65	45	80	66.25
Communicate damages and breakdowns via pictures and video calls (with the technical support desk)	40	70	50	40	60	75	80	75	40	80	60.75
Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type	65	80	60	70	60	80	100	80	80	85	76.25
Offer digital training exercises which explain how to use the machine (e.g. tutorials, playful exams, VR, etc.)	60	75	50	55	75	70	80	65	65	60	70.25

Figure 28: Filled score-sheet 2

Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he has to pay more.	70	75	70	80	80	70	80	80	80	80	78
Ask for feedback after off-renting a machine / closing off a rental	70	90	70	70	61	75	80	61	60	65	72.35
Show 'third party' and competitor machines / allow the user to add these machines manually to have an overview of the total amount of machines on site	85	90	90	90	65	80	90	80	70	100	80.25
Communicate damages and breakdowns via pictures and video calls (with the technical support desk)	80	75	70	70	80	80	80	80	70	75	78
Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type	80	90	75	80	70	85	85	90	80	80	84
Offer digital training exercises which explain how to use the machine (e.g. tutorials, playful exams, VR, etc.)	80	85	75	65	80	85	85	85	75	80	82

Figure 29: Filled score-sheet 3

Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he has to pay more.	90	80	85	80	80	95	95	76	75	40	84.7
Ask for feedback after off-renting a machine / closing off a rental	70	95	65	80	65	90	70	85	75	80	80.25
Show 'third party' and competitor machines / allow the user to add these machines manually to have an overview of the total amount of machines on site	95	95	97	95	72	85	91	85	85	85	88.05
Communicate damages and breakdowns via pictures and video calls (with the technical support desk)	95	95	91	90	70	95	100	75	80	100	85.95
Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type	90	90	90	90	91	100	100	100	90	70	94.65
Offer digital training exercises which explain how to use the machine (e.g. tutorials, playful exams, VR, etc.)	87	85	85	90	85	90	100	82	90	100	86.55

Figure 30: Filled score-sheet 4

			20%	25%	-5%	5%	15%	5%	10%	20%	10%	-5%	1
Project	Project manager/lead	Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
Project 1	Stasz Zernicke	Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he has to pay more.	66	89	40	46	70	60	79	98	76	76	75.8
Project 2	Nick Scipio	Ask for feedback after off-renting a machine / closing off a rental	70	95	50	30	100	95	70	100	95	70	89.5
Project 3	Raveesh Raveendranath	allow the user to add these machines manually to have an overview of the total amount of machines on site	60	70	80	60	70	85	80	70	70	30	70.75
Project 4	Stasz Zernicke	Communicate damages and breakdowns via pictures and video calls (with the technical support desk)	70	80	50	70	60	70	90	75	70	40	76.5
Project 5	Nick Scipio	Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type	88	94	60	85	60	90	95	95	90	70	89.85
Proejct 6	Raveesh Raveendranath	Offer digital training exercises which explain how to use the machine (e.g. tutorials, playful exams, VR, etc.)	75	85	70	80	65	85	90	80	80	70	80.25
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Figure 31: Filled score-sheet 5

Project	Project manager/lead	Details	Business Value	Customer Value	Operational Costs	ROI	Technical Feasability	Ease of use	Marketing potential	Potential for scalability	Ease of implementation	Time for development	Total scores
Project 1	Stasz Zernicke	Allow the customer to order 'urgently needed' machines via My Riwal (not only by phone) and communicate that he has to pay more.	56	75	50	35	60	50	70	90	60	75	64.2
Project 2	Nick Scipio	Ask for feedback after off-renting a machine / closing off a rental	60	85	60	30	90	85	60	90	85	80	78
Project 3	Raveesh Raveendranath	allow the user to add these machines manually to have an overview of the total amount of machines on site	50	80	90	50	60	75	70	60	60	40	63.75
Project 4	Stasz Zernicke	Communicate damages and breakdowns via pictures and video calls (with the technical support desk)	60	70	60	60	50	60	80	65	60	50	64.5
Project 5	Nick Scipio	Show machine prices in 'Rent A Machine' in case the customer has a contract (based on duration and machine type	80	85	50	75	50	80	85	85	80	80	79.5
Proejct 6	Raveesh Raveendranath	Offer digital training exercises which explain how to use the machine (e.g. tutorials, playful exams, VR, etc.)	65	75	60	70	55	75	80	70	70	80	69.25
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Figure 32: Filled score-sheet 6