ALIGNING KNOWLEDGE AND INNOVATION MANAGEMENT

A qualitative study on the current alignment between knowledge management and innovation management at the Dutch government real estate agency and recommendation on how to improve the alignment

Abstract

The Rijksvastgoedbedrijf (RVB) is the real estate organization of the Dutch government responsible for the development, management, and conservation of its real estate portfolio. In the coming years, it has to innovate to meet the climate, energy, and environmental targets set by the government. Innovation management is applied at the RVB to guide the innovation processes in the organization. Innovation is inevitably related to knowledge. In order to innovate knowledge is necessary and by innovating knowledge is created. Knowledge management is applied RVB wide to manage the knowledge present and created at the RVB. The aim of this study is twofold: to find out how the alignment between knowledge management and innovation management is currently produced at the RVB, and to give recommendations on how this alignment can be improved. There is limited literature on the alignment between the two types of management, this study contributes to the theory combining these concepts. Eleven in-depth interviews, document analysis, participant observation, and secondary data allowed the creation of a design of the current alignment of knowledge and innovation management. The results show that the current alignment is not sufficiently organized yet. One of the main bottlenecks in the alignment is indicated to be in the flow from knowledge, both tacit and explicit, to innovation projects. This is due to a lack of a centralized place where explicit knowledge is stored and a lack of an overview of who has tacit knowledge and where this is located within the organization. A second bottleneck is the lack of evaluation of the innovation projects which hampers the creation of knowledge from innovation. Based on literature and the empirical results multiple recommendations are given to improve the alignment. These include institutionalizing the evaluation of innovation projects, centralizing the storage of explicit knowledge, making the tacit knowledge infrastructure more visible, and putting both knowledge management and innovation management more on the map at the RVB.

Key words: Innovation management; knowledge management; Rijksvastgoedbedrijf

Preface

This thesis marks the end of my time at the Erasmus University and the end of my internship at the Dutch Governmental Real Estate Organization. During the last six months, I was lucky enough to receive support that enabled me to write this thesis, to these people I would like to express my gratitude. I wish to thank Martine de Vaan and Wim van der Post, my supervisors at the RVB, for welcoming me at the RVB and for their dedicated involvement throughout the process. I want to thank Jasper Eshuis, my thesis supervisor, for guiding me through the thesis process and his extensive feedback. Last but not least I would like to thank my friends and family for their support and encouragement.

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1.   Introduction

In this chapter, the foundation for this thesis is presented. The chapter will start with a motivation to conduct the research which will subsequently lead to the problem statement. Next, the relevance of this thesis will be discussed.

1.1 Motivation research

The Rijksvastgoedbedrijf (RVB) is the real estate organization of and for the Dutch government. Its responsibilities include the development, management, and conservation of the largest real estate portfolio of The Netherlands. In the coming years, the RVB has to deal with a multitude of arising challenges, including the energy transition, climate adaptation, and circular construction. For these kinds of problems it is difficult to define what the actual problem is or how to solve these. It is often not possible to apply standard solutions to these kinds of problems. What these cases require is the formulation and implementation of new and smart solutions (Sorensen & Torfing, 2012; Jiménez-Jiménez & Sans-Valle, 2007). What is needed is ongoing innovation. The position that the RVB has, being the largest real estate organization in The Netherlands gives the organization the possibility to play a significant role in pushing innovation within the real estate sector (RVB, 2020).

In 2020 the RVB created an innovation agenda stating their five focus points on innovation: a productive work environment, sustainability, digital transformations, collaboration with the market, and area cooperation. The innovation agenda describes which components of the organization have to be developed in order to make innovation within the RVB successful, as well as the phases that innovation can go through from idea to implementation.

Dealing with arising challenges requires innovation to become a natural discipline in government. Following Bason (2010, p.8) this requires public leaders to create ways in which innovation can be institutionalized by setting up structures and processes to embed innovation as a core activity of the organization (Bason, 2010, p. 8). The RVB employs innovation management to look where the actual needs for innovation are for the different focus points, where innovations have to start, which resources should be allocated where, how to manage the progress of innovation, and who is responsible for the upscaling of innovation (RVB, 2020).

The challenges and ambitions of the Rijksvastgoedbedrijf also call for knowledge. The need for innovation places new and higher demands on the availability and the interchangeability of knowledge (Mackenzie Owen, 2001). Without sufficient knowledge, the RVB can't deal with these challenges and realize its ambitions. This is because complex processes call for a high level of knowledge (Mackenzie Owen, 2001). The expertise which is available at the RVB is the added value that it offers. With over 2300 employees present at the organization with different fields of expertise there is a lot of knowledge available. This knowledge is in the form of technical knowledge, policy goals, procurement processes, innovation, maintenance, and on the surroundings and users of the real estate (RVB, 2020). Knowledge management can be applied to focus on the role of knowledge in the organization in order to take full advantage of all the available knowledge (Mackenzie Owen, 2001).

Knowledge and innovation are closely related to each other. Innovation often builds on the knowledge available from earlier projects or experts. While innovation itself results in the creation of knowledge. The sharing of information and knowledge can lead to new insights which leads the way to innovation (Jiménez-Jiménez & Sans-Valle, 2011, Nonaka; 1994). For these processes to happen it is important to align the management of knowledge and the management of innovation. From the literature on knowledge and innovation, it can be deducted that without the management of both to work together tightly the necessary knowledge for innovation will be suboptimal and the risk is that knowledge created by innovating will not result in added knowledge for the organization (du Plessis, 2007).

1.2 Problem statement

To enhance the functioning of both the management of innovation and the management of knowledge the two forms of management have to strengthen each other (du Plessis, 2007). To date, it is not yet sure in which way this is best done. The goal of the thesis is therefore to create a set of recommendations on how innovation management and knowledge management at the RVB could strengthen each other. This goal is going to be realized by answering the following research question;

> *How do knowledge management and innovation management align within the Rijksvastgoedbedrijf and how can this alignment be improved?*

To guide the process of the thesis project, several sub-questions are created. There is already a significant amount of literature on knowledge and innovation management available. First, the existing literature on both forms of management will be studied to see how they can be applied effectively and what is the link between them. Based on the first two theoretical sub-questions a theoretical design can be constructed on how knowledge management and innovation management increase their synergy. The subsequent sub-question is aimed at looking at the specific context of the RVB in order to fit the design to the actual conditions within the RVB.

Sub question 1:   What is innovation management according to literature?

Sub question 2:   What is knowledge management according to literature?

Sub question 3:   How can knowledge management and innovation management be aligned according to literature?

Sub question 4:   How are innovation management and knowledge management currently aligned at the RVB?

Sub question 5:   How can the alignment between innovation management and knowledge management be improved?

1.3 Relevance research

Social relevance

As a public organization the legitimacy and support of the RVB are strongly connected to the public value that they create for society (Moore, 2012). The lack of synergy between knowledge management and innovation management leads to suboptimal use of the expertise and capacities that are present at the RVB. What this means is that there is not as much public value created for society as the organization is able to. Therefore it is in the interest of society to find answers to how knowledge management and innovation management can strengthen each other in order to function in a more optimized manner and to create more public value. Concretely, by aligning KM and IM, the RVB can increase the public value by innovating to improve the work environment for civil servants to ensure the public sector is functioning well.

Public management relevance

The RVB is not the only organization in its sort with both public and executive roles. Similar organizations aimed at delivering public services include Prorail and Rijkswaterstaat. These public organizations also have similar ambitions and challenges which they have to address that often require innovation and knowledge. The results and recommendations can be relevant to them as well. Since all organizations are different the results from this research might not be a direct match to their organization. With the knowledge created with this research, they can draw their own lessons which apply to them.

Scientific relevance

Innovation management and knowledge management are no new terms. There has already been done extensive research on both subjects. In literature, effective knowledge management, effective innovation management, and the elements that are important to both types of management are thoroughly discussed (e.g. Mackenzie Owen, 2001; Nonaka, 1994). There is, however, limited literature on how these two forms of management relate to each other or how they can work together to strengthen each other. Gold et al. (2001) and Adobor et al. (2019) argue that knowledge management can aid innovation in an organization. They do not discuss how knowledge management and innovation management relate to each other. The scientific relevance of this research lies in supplementing the literature on knowledge management and innovation management, more specifically on how these two forms of management relate to each other, and by applying the theoretical insights to the empirical situation of the RVB.

1.4 Reading guide

This research is divided into six chapters. The second chapter is the theoretical framework in which different theories will be discussed and applied to the case of the RVB. Based on the theory a theoretical design will be made on how knowledge management and innovation management can be aligned. In chapter three the research design will be described, including the methodology of data collection and data analysis. In the fourth chapter, the empirical results will be presented on the current alignment. Subsequently, the fifth chapter will give the conclusion together with the practical recommendations in which the research question will be answered. This research will be finalized with a discussion reflecting on the limitations of the study and recommendations for future research.

2. Theoretical framework

This chapter presents the theoretical framework divided into three sections. The first section will look at the theory that is available on knowledge management, in order to answer the first sub-question of what effective knowledge management is. The second section will do the same for innovation management. The third section will try to answer the third sub-question by looking at how knowledge management and innovation management relate to each other according to the literature.

2.2 Knowledge management
2.2.1 Knowledge

An important distinction to make when talking about knowledge is between knowledge and information. Nonaka (1994) describes information as the flow of messages. Information takes raw data and gives it context, in this way facts are shaped to create information (Van Beveren, 2002). Knowledge is created with the use of information; however, the way it is created is influenced by the beliefs of the one who obtains the information (Nonaka, 1994). Knowledge is shaped by an individual's stock of prior information, skills, experiences, beliefs, and memories (Van Beveren, 2002).

Nonaka and Takeuchi (1995) make a distinction between two types of knowledge; "tacit knowledge" and "explicit knowledge". Explicit knowledge is the knowledge that can be captured and shared. This knowledge is often expressed in words and numbers. But this does not entail all of the knowledge which is out there. Tacit or implicit knowledge is the knowledge that an individual has but that is hard to formalize and communicate and is not explicitly represented (Nonaka & Takeuchi, 1995). In knowledge management, tacit knowledge is often used for knowledge that is non-quantified. This knowledge especially relates to social interactions, social practices, and how things get done in a group or an institution (Linde, 2001).

Knowledge can come from documents and information systems, or it can come from learning processes in which implicit or explicit knowledge is transferred. These learning processes can be distinguished into four different forms of learning or knowledge sharing (Mackenzie Owen, 2001; Nonaka, 1994).

1. Socialization: in this learning process knowledge is transferred by observation and imitation of other people who have the knowledge that is wished to capture. In this learning process, implicit knowledge is transferred from the person observed to the implicit knowledge of the person observing. Knowledge is transferred in this process without the use of language.

2. Externalization: this is a rational learning process in which people translate their implicit knowledge to explicit knowledge by expressing this knowledge in explicit terms like theories, models, or concrete examples. Through this externalization, process knowledge can be shared in a way that it can be applied, edited, and transferred.

3. Combination: in this learning process explicit knowledge is acquired and subsequently processed by analyzing, organizing, comparing, or by making relationships with other subjects. In this way, the initial explicit knowledge is broadened and can lead to new explicit knowledge with more understanding and insight.

4. Internalization: explicit knowledge is internalized by an individual to generate implicit knowledge. This implicit knowledge can be applied by individuals.

With the learning methods of externalization and combination knowledge is expressed and captured in an encoded manner, or documented information. Having knowledge in a documented form can act as a medium between available knowledge and individuals who can apply this knowledge (Mackenzie Owen, 2001). With the other two learning methods, socialization and internalization, documented information plays no role in documenting or transferring knowledge. Knowledge is transferred through learning processes based on interpersonal relations, human behavior, and social behavior (Mackenzie Owen, 2001).

Knowledge creation should not focus on either creating tacit or explicit knowledge, since both only cover part of the total knowledge available. Disregarding tacit knowledge can make explicit knowledge superficial due to a lack of context. While disregarding explicit knowledge leads to the knowledge being limited applicable to other cases (Nonaka, 1994). Organizations should convert transferable tacit knowledge into explicit knowledge so efficiencies in production and innovation do not get lost. However, organizations should not overuse technologies and processes to externalize tacit knowledge since this might

marginalize rich tacit knowledge to explicit knowledge in a form suitable for storage (Gold et al., 2001).

Some parts of tacit knowledge are hard to make explicit. Therefore, instead of trying to make those parts of tacit knowledge explicit, it is often better to focus on knowledge transfer through learning processes (Mackenzie Owen, 2001).

2.2.2 Knowledge management

With knowledge defined and how it can be shared, the next step is to examine what knowledge management is. Meckenzie Owen (2001) describes knowledge management as an approach to optimally use the available knowledge available in an organization. It is based on the identification and mapping of knowledge and creating procedures to generate, manage and apply the knowledge. Knowledge management allows knowledge to be available and usable when, where and by whom it is required (du Plessis, 2007). The focus of knowledge management is not necessarily on managing knowledge itself, but on organizing an organization and its processes so that knowledge is optimally utilized (Mackenzie Owen 2001). It allows collaboration, knowledge sharing, and learning. In this way, it allows for better decision making (du Plessis, 2007).

Mackenzie Owen (2001) distinguishes two forms of knowledge management, the management of people and the management of information. The first relates to the relationship between the knowledge of people and the organization. It relates primarily to the question of how tacit knowledge can be externalized or transferred, the socialization processes involved, and how the organization design has a role in that. Knowledge management allows the use of expertise and know-how that can be tacit in nature (du Plessis, 2007). The second form, management of information, relates primarily to the management of explicit knowledge in a manner that is accessible to the whole organization and how explicit knowledge can be shared among individuals. Adobor et al. (2019) state that organizations, therefore, need strategies for the management of both tacit and explicit knowledge.

For knowledge management six elements can be identified from papers by various authors, these elements are discussed below (Mansour et al., 2011; Che Rusuli et al., 2012; Liao & Wu, 2010; Mackenzie Owen, 2001; Gold et al, 2001; Adobor et al.,2019).

- Identification of knowledge needs. The first element of knowledge management is to identify what knowledge is necessary to achieve the goals and mission of an organization (Che Rusuli et al., 2012). It starts with realizing that a particular knowledge can have added value to the organization (Mansour et al., 2011).

- Discovery of existing knowledge. This element concerns itself with finding out which information exists within the organization and where this knowledge is present. Knowledge can exist in various formats within the organization, both tacit and explicit (Mansour et al., 2011). This will also indicate where there is a knowledge gap in the organization.

- Acquisition and creation of knowledge. This element of knowledge management is focused on obtaining additional or new knowledge. It includes the activities of extracting, interpreting, and transferring knowledge in order to improve the yet existing organizational knowledge present (Adobor et al., 2019). The acquisition of knowledge can come from different sources, both internal and external (Liu & Liu, 2008; Adobor et al., 2019). Knowledge can also be created by the organization itself. Innovation is one form of acquiring knowledge by creating new knowledge from the application of existing knowledge (Gold et al., 2001). The acquisition of knowledge can be stimulated by technology, organizational structure, leadership, and culture (Abador et al., 2019). Much of the knowledge that is present in government organizations is tacit. It is important that knowledge is captured by formal processes of translating tacit knowledge into explicit knowledge, so the knowledge is not lost when individuals leave the organization. Tacit knowledge depends a great deal on the experiences of individuals, the codification of this knowledge is one of the best ways to capture this knowledge (Abador et al., 2019). Not all knowledge can be captured with the externalization of tacit knowledge (Nonaka & Takeuchi, 1995), therefore the acquisition process should also focus on how tacit knowledge is acquired. What is important for the acquisition of knowledge is that there is a clear vision and strategy for knowledge acquisition, since organizations that have a clear

strategy are more likely to pursue knowledge acquisition the organizations without one (Abador et al., 2019).

- Storage and organization of knowledge. This element is focused on making the acquired and already existing knowledge useful storing and organizing it (Abador et al., 2019). This process aims to make knowledge and information useful for the whole organization and systems are created and managed through which this information can be found and distributed (Mackenzie Owen, 2001). Without the retainment of knowledge, organizations will not be able to learn from projects, experiences, and lessons learned (Abador et al., 2019). This element is highly influenced by an organization's ability to organize, integrate, combine, structure, coordinate, or distribute knowledge (Gold et al., 2001). It is important for an organization to create a framework for organizing its knowledge. Without standards on how to handle knowledge, it is difficult to manage knowledge effectively as knowledge would lack consistency. Consistency in the knowledge format makes it clear how knowledge should be stored and makes it easier to retrieve. For knowledge-based work, it is important to be able to localize all relevant information and knowledge which can be scattered throughout the organization. Therefore it is important that there is an integration of different information sources/systems of different sections of the organization. Combining scattered knowledge reduces repetition, reinforces a common format, and improves efficiency (Gold et al. 2001).

- Sharing of knowledge. The element of knowledge sharing should ensure that stored knowledge is made accessible to those who need it (Mansour et al., 2011). Communication systems can play a big role in the spreading of knowledge throughout the organizations and the exchange between individuals, it is a way to spread knowledge optimally through the organization (Mackenzie Owen, 2001).

- Use and application of knowledge. This element is focused on the conversion of knowledge to new knowledge, products, or services. It is important to monitor or measure the application of knowledge in order to evaluate the success of the knowledge management process, as it might be the most critical part of knowledge management. Monitoring has to be accompanied by improvement programs considering the different elements of knowledge management, like knowledge acquisition or storage (Mansour et al., 2011). Abador et al. (2019) list three barriers

to knowledge application: fragmentation, overload, and de-contextualization. When knowledge is scattered throughout the organization it inhibits individual employees to retain this knowledge. Information overload occurs when there is too much information and it becomes problematic to find relevant information. The third barrier is the result of information that is too difficult to comprehend when retrieved. The application of existing knowledge can lead to the creation of new knowledge, this would create a loop from the application processes back to the creation of knowledge element (Mackenzie Owen, 2001).

2.2 Innovation management

In order to answer the second sub-question, this section of the theoretical framework will give a literature overview on innovation management. It will start with the definition of innovation and the types of innovation. The second part of this section will discuss effective innovation management.

2.2.1 Innovation

The definition of innovation differs between different authors, what most definitions of innovation have in common is that innovation is seen as the adaptation of ideas or behavior that is new to the organization to solve problems created or defined by an organization (Jiménez-Jiménez & Sans-Valle, 2007; Nonaka, 1994; du Plessis, 2007). In the public sector, innovations are created with the final aim of creating value for society (Bason, 2010, p. 34). Innovation helps companies and organizations deal with changes in the environment and to deal with complexities and change. This will enable them to respond faster to challenges and utilize opportunities better than non-innovative companies (Jiménez-Jiménez & Sans-Valle, 2011). In the public sector, the focus is on creating societal value. In order to do so, organizations have to generate and select the best possible ideas and implement them effectively (Bason, 2010, p. 34).

When talking about innovation it helps to make a distinction between different kinds of innovation. The first distinction that can be made is between incremental and radical innovation. With radical innovation completely new processes or products are introduced. This causes it to be associated with high degrees of uncertainty and risk. Incremental

innovation however is focused on gradually changing processes or products for the better (Bason, 2010, p. 40). Besides the rate at which innovation occurs, a distinction can also be made on the type of innovation. Four types of innovations can be distinguished (Tidd, Bessant, & Pavitt, 2005, p. 10).

- Process innovation. This type of innovation focuses on processes that occur within an organization. This involves structures, work processes, and routines, and how changes in these factors affect an organization's output. Process innovation can be split up into administrative and technological processes (de Vries et al., 2015).
- Product innovation. This innovation is based on the final output of an organization delivered to individuals or entities outside the organization. For the public sector, these are often services or policies.
- Positional innovation. This innovation regards changing the context of an already existing product or service. This can cause another meaning for the users or new user groups.
- Paradigm innovation. This type of innovation occurs when the underlying mental models of an organization are changed completely.

2.2.2 Innovation management

For innovation to thrive within an organization it needs to be managed properly which includes a clear process on how to innovate. Without good management, it would be difficult to find the right level of support to innovate within the organization and to integrate innovation into the main business (Viki et al., 2019, p.25). Innovation projects go through multiple stages until implementation. During these stages interactions with multiple actors from different parts of the organization are necessary. Successful interaction throughout the organization requires this process to be managed (Viki et al., 2019, p.29). Innovation in the public sector depends on the ability to manage the innovation process as a whole to assure that the best ideas are selected, implemented, and that they result in the delivery of public value (Bason, 2010, p. 37). Innovation management is a very broad term and depending on the author it entails many elements. Table 1 displays the different elements that innovation management entails according to different authors. These authors are widely used literature in the field of innovation management. Based on these authors

five elements of innovation management are distinguished that encompass and combine most of the elements of the different authors.

Table 1 Innovation management elements by different authors

Author	Elements
Viki et al., 2019	Innovation thesis, innovation portfolio, innovation framework, Innovation accounting
Adams et al., 2006	Input management, knowledge management, innovation strategy, organization and culture, portfolio management, project management, commercialization
Igartua et al., 2015	The strategy of innovation, portfolio management, project management, leadership and organizational culture, human resource, external relations, organizational design, innovation processes, performance measurement, marketing, resources management, knowledge, and intellectual property management, technology management
Oke, 2007	Innovation strategy, creativity and idea management, portfolio management, implementation management, human resource management

Five elements of innovation management:

- Innovation thesis. An innovation thesis sets out the organization's future view on and strategic objectives of innovation. It includes the boundaries of innovation projects for projects to be considered by an organization (Viki et al., 2019, p29). Within these boundaries, there is room to create an innovation strategy for allocating resources to fulfill the objectives of an organization. Activities taken must be in accordance with the organization's overall strategy, the same goes for innovation goals set by management. The strategy and goals have to be reviewed and updated consistently with the mission of the organization (Igartua et al., 2015). The effectiveness of

innovation is positively influenced by various factors that are dealt with in the innovation thesis, these are; a clear link between the innovation strategy and overall business goals, leadership to make innovation happen through a clear vision for innovation, and promoting an entrepreneurial culture across the organization, a long term commitment to innovation, and a clear allocation of resources (Adams et al., 2006; Igartua et al., 2015). The innovation thesis therefore also has a human resource aspect in it, for it is important to find and align the right people, often leadership or management, to support the innovation (Igartua et al., 2015).

- Innovation portfolio. This element of innovation management is about creating an innovation portfolio in order for an organization to achieve its innovation thesis and strategy. The innovation projects in the portfolio should be selected based on strategic, technological, and resource choices, and should contain both early-stage and more mature projects. Therefore it is important to keep track in which stage innovation projects are. The overall goal of the innovation portfolio is to have a balanced portfolio that is an expression of the organization's strategy and innovation thesis (Igartua et al., 2015; Adams et al., 2006; Viki et al., 2019, p30). For the innovation portfolio, you have to deal with uncertainty within innovation management (Bason, 2010, p. 40). It is not guaranteed that an innovation results in the required outcomes and there is a chance that it will fail. The innovation portfolio needs to reflect this uncertainty by having alternatives for innovation projects so that the questions can be answered that the projects were intended to answer.

- Innovation framework. This element is about creating a framework to manage innovation to turn inputs into a marketable innovation. There are three general steps in a framework, these are creating ideas, testing ideas, and scaling ideas. A formal innovation framework provides a unifying language so everybody knows at which phase a project is in. Project efficiency is positively influenced by establishing formal processes for innovation (Adams et al. 2006; Viki et al., 2019).

- Innovation accounting. The accounting element of innovation management is necessary to make sure the right methods are used to measure success. Viki et al. (2019, p.30) propose three sets of innovation KPIs that organizations can use.
  - Reporting KPIs focusing on the product teams, their ideas, and their progress in the innovation framework.

- Governance KPIs focus on making the organization make decisions based on the innovation process.
- Global KPIs focusing on helping the organization examine how well the performance innovation projects are in the context of the whole organization.

- Innovation practice. This element deals with the development of innovation which has to be in line with the innovation framework. The common steps from the framework are idea creation, idea testing, and scaling ideas. Part of this element is dealing with the input necessary for innovation which includes financial, human, and physical resources. The literature describes various elements that are important to arrive at effective innovation practice. The management has to get the right resources at the right place at the right time. Human resources have to be mobilized for their skill and expertise to come up with innovative ideas and for various phases along the innovation process. Individuals with high levels of education and self-esteem tend to increase the effectiveness of projects, while a diverse background of team members results in more innovative ideas (Adams et al., 2006). Once an innovation is turned into a validated business model it can be scaled up (Viki et al., 2019, p.31). An important aspect of this is reaching the customer or the ones who are supposed to use the innovation. In this element of innovation management the marketing capabilities become important (Adams et al., 2006).

2.3 Theoretical Design

In the two previous sections, different elements of both innovation and knowledge management have been discussed. This section will show how these two concepts and the different elements of these concepts relate to each other. Based on the previous two sections of this paper a theoretical design is created on how knowledge management and innovation management can be aligned, which is shown in figure (1). Knowledge management and innovation management are related in a complex way. Innovation can be a source of knowledge for knowledge management when a knowledge gap within the organization is recognized and innovation is managed in such a way that innovation creates the lacking knowledge. Knowledge management does not necessarily rely on innovation management, since there are other ways in which knowledge can be acquired or applied

(Mackenzie Owen, 2001). In the innovation process knowledge is acquired, shared, and incorporated with the aim to create new products, processes, positions, and/or paradigms (du Plessis, 2007). Innovation management, therefore, relies heavily on knowledge management, since innovation builds on knowledge (Adams et al. 2006). Knowledge management can create a favorable environment for innovation (du Plessis, 2007). Therefore in the relationship between knowledge management and innovation management, innovation management relies more heavily on knowledge management than knowledge management relies on innovation management.
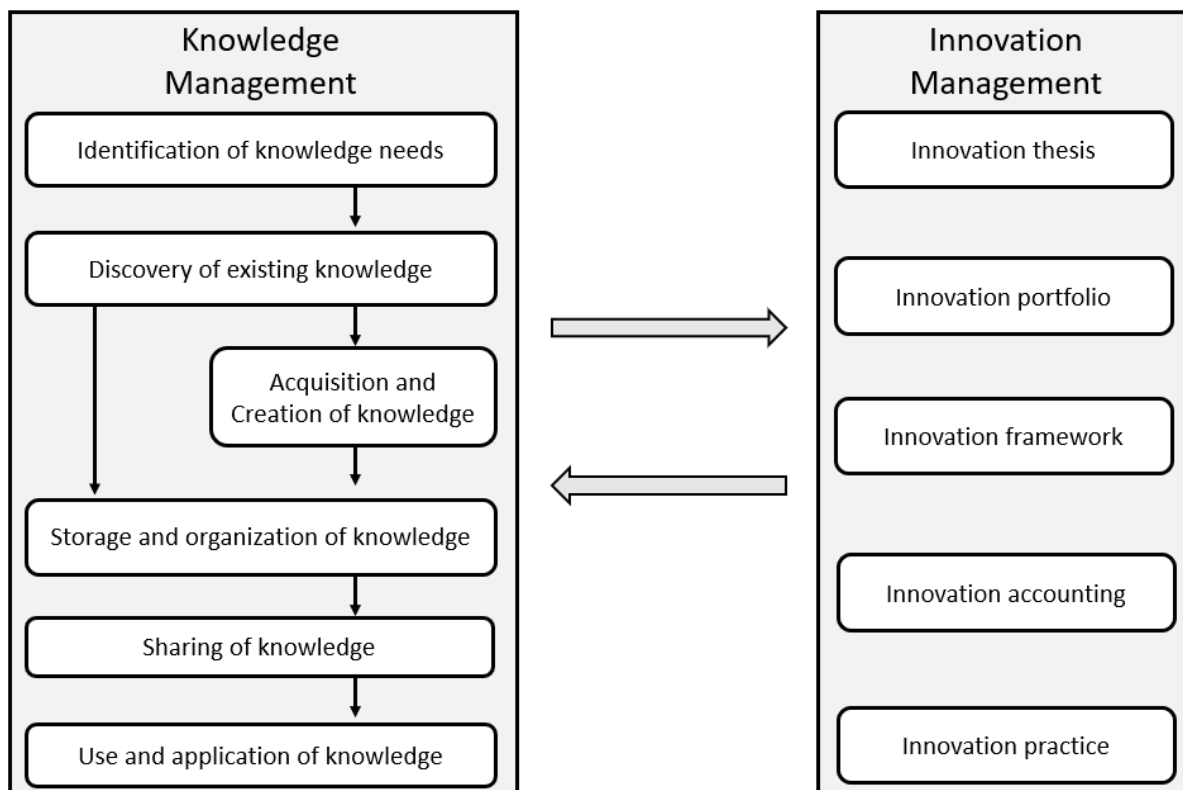

Figure 1 Theoretical design on alignment between knowledge management and innovation management

3. Methodology

In this chapter, the methodology of the research will be discussed. First, the research design will be discussed. Second, the methods for the collection and analysis of data will be described. Third, the validity and reliability of the research will be discussed. The chapter will be round off with the operationalization of variables of the concepts.

3.1 Research design

This study is performed predominantly in a deductive manner. Based on the literature on innovation management and knowledge management, a theoretical design has been created. Theoretical generalization will be applied in which a theoretical design is applied to an empirical case (van Thiel, 2021). Empirical data will be collected and analyzed which will be used to further develop the theoretical design. The research has an inductive component in the sense that based on the empirical findings a design on the alignment between knowledge management and innovation management will be constructed.

To study the alignment of innovation management and knowledge management it is important to gain a holistic view of how these two concepts relate to each other. A case study is the most suitable method because it allows in-depth analysis to seek patterns within an organization, in this case, the patterns of KM and IM within the RVB. Case studies are conducted in a real-life setting (Van Thiel, 2021). This research is focused on the real-life setting of KM and IM at the RVB which suits a case study research. The focus of this study makes also makes it a good fit for a case study due to its applied nature focusing on one issue in particular. The most appropriate way to do the case study is by applying qualitative research techniques. These qualitative research techniques allow for richly detailed and extensive descriptions.

3.2 Data collection

In this research mixed methods of data collection are applied. The first method applied includes semi-structured interviews. The interview questions were based on the operationalization of the variables from the theoretical design. These were conducted to gain detailed information on knowledge management and innovation management at the RVB. The interviews were recorded by the researcher and later transcribed. To guide the

interview process an interview manual was composed. To make the interview manual applicable and valid for each respondent, the manual was slightly adapted for each respondent.

Respondents were selected to gain insight into both KM and IM therefore ten respondents have been selected who work within the RVB on the innovation side and the knowledge side. Second, to RVB employees, one independent expert on knowledge management has been interviewed.

Besides the interviews, there are two more primary data collection methods applied and there is one extra secondary data source. The second data collection method applied in the research is document analysis. The documents were all internal RVB documents and were selected to gain insight into how knowledge management and innovation management are now managed or how they are planned to be managed. Appendix A gives an overview of the documents analyzed. The third source of data is through participant observation of the researcher and notes were taken during observation. In the period between the 28th of January and the 14 of June, notes have been taken during 10 meetings. These data provide information about how knowledge and innovation management are currently managed and about their alignment and were used as a check on the data from the interviews. The secondary data source comes from a survey that was done during the time this research was conducted. A group of RVB 'talents' did research into an online knowledge and innovation platform. For this research, they conducted a survey with 32 responses about the sharing and receiving of knowledge, the platforms used, and conditions for a good platform. The data from this survey is applied in this research.

3.3 Data analysis

For the data analysis, a case-oriented analysis is applied aimed at understanding thoroughly understanding the case by looking closely at its details (Babbie, 2012, p 391). The first step of qualitative data analysis was ordering the data (van Thiel, 2021, p.143). Next, the transcribed data was read and the technique of memoing was applied in which notes were written to support the analysis of the data. The next step was the coding of the data. In the coding process, individual pieces of data were classified or categorized by giving them a code together with a retrieval system. As a first step in the coding process, closed coding

was used to identify codes that fit the theory. The closed coding was done following the operationalization of variables (Table 1). A second round of open coding was applied to identify codes that can not be directly derived from theory. After the open and closed coding phases, selective coding was applied to analyze the open codes and identify the central concepts of the data (Babbie, 2012, p 398).

3.4 Validity and reliability

For the reliability of the research the researcher's biases must be minimized (Babbie, 2012, pp. 188-189). The reliability was aimed to be secured by thoroughly documenting all steps of the study and having a detailed transcript of all interviews. Second, an operationalization of variables scheme based on existing literature was used for the closed coding of the data. A second researcher can then check whether the primary researcher did not influence the researcher with their biases. Triangulation increases reliability by ensuring the quality of data gathered (van Thiel, 2021).

Validity refers to how the research reflects the real meaning of the concepts it wants to measure (Babbie, 2012, pp. 191–192). The external validity relates to how generalizable the study is. Due to the specific context of the RVB that is studied the external validity is limited.

Internal validity refers to how the validity of the result within, is there a clear relation between causes and effects. Data triangulation was applied to ensure a high internal validity of the research. The data collected in interviews, observation, document analysis, and secondary data sources all measure the same phenomenon. This triangulation of data collection ensures that the data collected are valid even though only one case is studied because the diversified approach allows the researcher to gather as much information as possible (van Thiel, 2021). By ensuring interviewees that the interviews were anonymous the risk of socially acceptable answers was reduced.

3.5 Operationalization
In the table below the operationalization of variables is presented. The strategy for the operationalization is to leave the indicators abstract. The reason for this is that before the interviews it is not yet clear how the elements will present themselves within the organization. Abstract indicators allow for a broad range of aspects to fit within the

indicator and prevent the empirical world is approached with a perspective (indicator) in mind that does not fit with the situation in the organization.

Tabel 1 Operationalization of variables

Variable	Element	Indicators
Knowledge management = organizing an organization and its processes so that knowledge is optimally utilized within (Mackenzie Owen 2001)	Identification of knowledge needs	It is defined which knowledge is required for the organizational goals, mission, or strategy.
	Discovery of existing knowledge	Finding out which experts or experienced people are present within the organization with know-how about the knowledge needs. Finding explicit knowledge on the knowledge needs The knowledge gaps between existing knowledge and required knowledge are identified.
	Knowledge creation	Generation of new knowledge; new skills are acquired, new procedures are created, new factual knowledge is created, etc.
	Storage and organization of knowledge	There is a system for the storage of knowledge. Different knowledge sources within the organization are integrated and combined. There is a clearly defined structure within the organization on how knowledge is handled. Databases are used for storing or organizing knowledge.
	Sharing of knowledge	Tacit knowledge is shared through human capital with expertise or experience.

| | | Explicit knowledge is shared through documents.

Communication systems are used for the sharing of knowledge. |
|---|---|---|
| | Knowledge application | Knowledge is converted to new knowledge, products, or services. |
| Innovation management= is the management of innovation processes and projects. | Innovation thesis | A strategy for innovation and the allocation of resources is created.

A goal for innovation is formulated. |
| | Innovation portfolio | Innovation projects for the innovation portfolio are selected.

Innovation projects are monitored. |
| | Innovation framework | A formal innovation framework is in place to manage innovation projects. |
| | Innovation accounting | Accounting methods are used to measure innovation processes and their performance. |
| | Innovation practice | The creation of ideas for innovation projects.

Idea testing through pilot programs.

Scaling ideas

Managing resources necessary for innovation.

Mobilization of human capital/expertise |

4. Empirical findings and Analysis

In order to answer the sub-question about the current alignment of knowledge management and innovation management at the Rijksvastgoedbedrijf (RVB) and the sub-question on how this alignment can be improved, the findings from document analysis and interviews will be elaborate in this chapter.

This chapter will initiate by elaborating on the current manner in which knowledge management and innovation management are organized at the RVB. The following section will elaborate on the current alignment between knowledge management and innovation management.

4.1 Organization knowledge management

Multiple respondents typify the RVB as an organization with a complex structure. In this notion, they often relate to the RVB's organogram with the four departments and many sub-departments. In the current situation, the sharing of knowledge within these four departments and sub-departments is not optimally organized. An interviewee mentioned that in order for the RVB to reach its strategic portfolio targets more efficiently all four departments have to be involved and that this requires organization-wide knowledge sharing across the borders of the departments.

Since the end of 2021, the RVB has created the position of knowledge manager, tasked with implementing and organizing knowledge management organization-wide. This is done by creating horizontal links between the vertical lines of the four departments with the aim to enable cross-boundary knowledge sharing, both tacit and explicit. In April 2022 a knowledge management year plan was published by the knowledge manager forming the basis for the implementation of knowledge management for the year 2022.

Besides the knowledge manager, eight knowledge coordinators manage 21 knowledge lines within the departments of A&T (architecture and technology) and VB (real estate management). From the interviews, it can be concluded that the role of knowledge coordinator is a role that is open to interpretation and can be unclear to the knowledge coordinators. The interviews and survey showed that some RVB employees are unfamiliar with the coordinators or do not know what their role is. In the survey the question was asked if one were familiar with the knowledge coordinators; the results pointed to the fact

that one in three people were not aware of the existence of the coordinators. And from the 32 people who responded to the survey, only 13 people were in contact with the coordinators.

Elements of knowledge management at the RVB

Knowledge agenda/ knowledge needs

As stated in the knowledge management year plan, in the third quarter of 2022 there is a knowledge agenda coming for the RVB created by the knowledge manager. This agenda is set to be a directing instrument for the topics on which knowledge management will focus. The topics that knowledge management should focus on are decided upon based on the strategic goals of the RVB, its ambitions, and the innovation agenda. The knowledge agenda will set the boundaries for knowledge management. It will be a guiding principle for knowledge management at the RVB in order to focus and prioritize the limited time and knowledge available. It prioritizes the topics that have to be worked on with the aim to raise awareness on these topics and to increase the efficiency of the limited hours and capacities.

Discovery of existing knowledge

An element of knowledge management at the RVB is to make clear which knowledge is necessary for the near future, which knowledge and skills are lacking at the moment, and in which way the knowledge and expertise can be offered to employees effectively. For the inventory of the knowledge and expertise present at the RVB knowledge audits will be held by the knowledge coordinators as stated in the knowledge management year plan. These audits are aimed to gain insight into existing knowledge gaps and if the employees have the right level of knowledge for their function. This will indicate if new knowledge has to be acquired or if employees need training. Knowledge audits are not yet in practice but are set to take place end of 2022.

Acquisition and creation of knowledge

To analyze the findings on the acquisition and creation of knowledge, I will use an analytical distinction between knowledge that is actively steered on to be created or acquired and the knowledge that is not actively steered on. On the question of what is done when there is a lack of knowledge available on a topic one interviewee answered the following;

"There are all kinds of strategies, sometimes it is not solved, but now more and more people are coming into the e-function, so on information and digitizing. so those skills were really scarce and that is slowly getting better. The RVB has no problem with external knowledge, so hiring it, but that is not always the right way. Because you still need it for a long time. You can commission a research project, that's fine, but in order to carry it through you're better off having it in-house, within the knowledge lines and within those that are active there is also active management to maintain knowledge and that can also be done via excursions and courses and all sorts of things" (interviewee 1)

This quote indicates the three ways in which the acquisition of knowledge is actively steered on. The first is through excursions and courses that can be offered to employees. In the knowledge management year plan 2022 of the RVB, it is stated that if employees don't have the required knowledge for the job they have, this can lead to general knowledge and training plans for each job group. In this way, knowledge management actively steers in the creation of knowledge for its employees. For the training of employees, there is a link with the RVB academy which offers the possibility of such trainings. A second manner in which the acquirement of knowledge and expertise is actively steered on is by hiring people with the required knowledge. This was for instance the case with the information and digitalization expertises. Due to a scarcity of people with these skills at the RVB more people were brought in with these skills. The final manner in which knowledge is actively acquired is through hiring outside parties with the knowledge to perform a study on a certain topic.

Besides the creation of knowledge that is actively steered on a lot of knowledge and expertise are created during day-to-day operations at the RVB. This can be at meetings where topics are discussed or in innovation projects where lessons are learned and expertise is created.

<u>Structuring and organizing knowledge infrastructure</u>

Multiple interviewees indicate that the knowledge storage element of knowledge management is not sufficiently organized and embedded within the organization. They argue that there is no overview RVB wide of which knowledge is present and which knowledge is not. The risk is that people will work on, or struggle with issues on which there

is already knowledge present. It also impairs people to build further on the already existing knowledge.

The literature has shown that for the storage of knowledge it is good to focus on both aspects of knowledge separately, tacit and explicit knowledge (Adobor et al., 2019). The storage of tacit knowledge has to do with the comprehensibility of the informal knowledge network. This has to do with having an overview of which people have knowledge and expertise about a certain topic and where these people are located within the organization. In the current situation at the RVB, this is lacking, as one of the interviewees indicated.

"That has partly to do with knowledge management, partly also simply with the organization, making sure that people know each other, and that they also know of each other what they are doing. And I think that this is still insufficiently organized at the moment… It's just not sufficiently clear at the moment who does what, and who has which knowledge. So in this you have all these small groups who know each other, but as a whole, as an organization, we make far too little use of each other's knowledge." (interviewee 8)

From the interviews and survey, it can be deduced that at the moment it is unclear where and which people with expertise and knowledge are there at the RVB. Most interviewees argue that they perceive the RVB as a network organization. Interviewees indicate that they know of people with expertise and knowledge through the informal network ties they build up working at the RVB. The lack of an overview on who does what and where people are in the organization also results in work being done that is redundant. As one of the interviewees mentioned *"but then at a certain point you find out that sometimes there is another club that is better, that just has a different name on it and actually does the same thing, and does have that knowledge that is working on it"* (interviewee 5).

From the interviews and survey, it can be deduced that for the storage of explicit knowledge there is also a lack of overview. In the case that a report or the lessons learned from a project are created, interviewees indicate that this knowledge is often stored on somebody's computer or remains in somebody's email inbox, as one of the interviewees indicated *"Now it is always still often all organized in folders and in binders and actually a bit via via, do you know where this is o I'll mail it to you"* (interviewee 8). The knowledge is not stored in a manner that is accessible to a wide audience. This knowledge is accessed

through people their network, asking people if they know something about a topic. Due to this only few people can access it and the chances are high that this knowledge gets lost in the long term.

"I think there is just a kind of missing database where you can find things for the long term…. And maybe it is not always knowledge but sometimes also information but at least you have an overview of what is there and what is not there." (interviewee 3)

It is not the case that there is no platform available for the storage of knowledge. From the survey, it became clear that many platforms are being used for the sharing of knowledge. These platforms are 'Samenwerkruimte', a common online drive, 'Filenet', Rijksportaal', and 'Plein BZK'. Some of the respondents indicated that there are too many platforms available. Most of the people surveyed use between zero to two of the platforms mentioned. There is no commonality or guideline on which platform to use. And for instance, the 'samenwerkruimte' and common online drive are only accessible to a limited amount of people. Because not everybody is using the same platform, or a platform, and some platforms have limited accessibility, knowledge is currently not stored in an orderly manner that is accessible to all employees.

<u>Sharing of knowledge</u>

From the interviews and survey, it can be deduced that for the sharing of knowledge people run into the same problems as for the storage of knowledge. On the questions about the sharing of knowledge at the RVB a common response among interviewees had to do with that they perceive the RVB as a network organization; *"the RVB is a real network organization. You have to get to know each other to get anything done. Of course, it's actually pretty bad that that's necessary"* (interviewee 9).

Interviewees argued that sharing of knowledge and finding people with expertise and knowledge at the RVB goes through your own network that you build up. If you are in a position in which you do not create a big network or when you are new in the organization it is hard to find people with expertise and knowledge on a topic. It is unclear to people where they have to go to in order to access knowledge. Tacit knowledge is mostly shared through people's network. If knowledge is outside your network it is hard to access.

"It's just not sufficiently clear at the moment who does what, and who has knowledge together. so in this you have all these small groups who know each other, but as a whole, as a company, we make far too little use of each other's knowledge." (interviewee 8)

For the sharing of tacit knowledge, a possible solution was discussed in various interviews, which is to initiate communities of practice (CoP) at the RVB. In the interviews, there were mixed feelings about the option to have CoP's at the RVB.

"so I have my hopes very much set on those communities, connect knowledge with what we really do, how do we make sure that the knowledge of people within RVB improves, and how is the relationship with the pilots. For me, the knowledge, That's the central thing that it should revolve around. That's what I think. that's my opinion" (interviewee 5)

"A knowledge community, if that's the term, it's purely about 'If you want to know something you can come here'. That's just like a kind of question bank, bulletin board, it's a club where you say 'OK we make sure that the people who are busy within that area of expertise, that they have a certain level of knowledge, so uniformity of knowledge... or is it a club that says we go one step further and say if you are in the area of expertise and say that is how we are going to do that, that it then becomes the RVB policy. so this becomes RVB process policy, this is our standard, so there they also determine the standards [...] But that is what I am also looking for. In practice this is an obstacle, we are dealing with different knowledge lines and with different departments. but what would RVB decisions that we make, because we can ultimately only automate one thing from the theme. That's not doable now" (interviewee 5).

Supporters of CoP's at the RVB indicate that it could help in crossing boundaries between knowledge lines and departments (interviewees 4,5,8). They also address a problem that is now experienced, that the standards that the lack of communication between departments can result in departments having conflicting standards. The main criticism of the option to have CoP's at the RVB had to do with the capacity of people to participate in the CoP (interviewees 3,4), as indicated in the following quote.

"to be honest, I have my doubts. It (CoP) sounds very nice. But I also know from previous work at a knowledge institution that it takes a lot of commitment to organize that. so then I would be who organizes that. Because it doesn't happen automatically and you have to keep

organizing that. So that is really maintenance in that sense. A community of practice at organizations does not happen automatically and people have to have time to be a part of that. And a community, a truly active community requires real commitment and time from its participants, otherwise, there is nothing to gain and nothing to bring. That is something that I myself am struggling with at RVB; the capacity of people to contribute to the program, for example. That you see that they want to say yes, but projects do come first. No time actually, and then they do it a little alongside the projects. But that is because they really want to do it, not because they actually have room for it." (interviewee 3)

For the sharing of explicit knowledge, interviewees argued that this is hard due to a lack of a central place in which it is stored. The multitude of platforms on which knowledge is stored and the lack of accessibility of some of these platforms makes it unclear where knowledge can be retrieved from. Interviewees indicated that in practice the sharing of explicit knowledge goes through the informal personal network that they have built up at the RVB.

"to ultimately share and find those documents in a good manner. Yes, we are just bad at that." (interviewee 8)

Another aspect of knowledge sharing is the structures and events that are in place by which people can share their knowledge. Multiple of these structures were mentioned in the interviews. During these interviews, it showed that it is not clear to everybody which structures and events there are for them to use to promote the knowledge they obtained.

The knowledge indoor is one of the knowledge sharing events present at the RVB mentioned in the interviews. This is an event that takes place once a month on a certain theme or social issue. The goal of this event is to share, exchange and spread knowledge. The knowledge week is another knowledge sharing event. During this knowledge week, knowledge is shared through presentations and workshops. Both these events allow people to find an event for the knowledge or ideas that they want to share. The third structure that can be used for the sharing of knowledge is the RVB academy. Through this structure trainings and workshops can be given to share knowledge with and educate RVB employees.

4.2 Organization innovation management

At the RVB there is an innovation manager in place. One of the tasks the innovation manager is involved with is the creation of the innovation agenda and creating a system to structure innovation within the RVB.

Elements of innovation management at the RVB

<u>Innovation agenda</u>

The innovation agenda was published in May 2020 by the innovation manager. It describes which innovation questions are the priority and shows which new concepts, products, and services are needed for the future to fulfill the RVB's expectations. There are five main innovation challenges identified for the RVB in the innovation agenda; productive workplace, sustainability, digital transformation, cooperation with the market, and area cooperation. These five challenges are for a large part created on the basis of the strategic goals of the RVB. The goal of the innovation agenda is to push innovation within the organization in a structured manner. For each of the innovation challenges, there is an innovation coordinator overseeing one of the challenges. For their specific challenge, they examine if it is being worked on sufficiently to achieve the goals. If this is not the case they look into the necessary steps that have to be taken. One of these steps is to acquire more knowledge necessary to work on the challenge.

In the second quarter of 2022, the innovation agenda is modified based on the experiences of the last years. In this modification, the innovation challenges of the innovation agenda are refined. Overall there are no significant adaptations to the agenda.

<u>Innovation portfolio</u>

In the innovation agenda, the innovation portfolio is described to be an overview of more than a hundred innovations at the RVB, the stage these innovations are in, and how they contribute to the innovation challenge. An interviewee argued that these innovations are in the portfolio because it has been decided that they have to succeed in order for the RVB to reach its strategic targets. And if these innovations don't succeed alternatives for them need to be found.

As described by the innovation agenda, for each of the innovation challenges there are innovation coordinators who keep an eye on the progress of the challenge they are responsible for. For their part of the portfolio, they include the innovation projects that add to their challenge and keep an eye on what happens to that challenge and keep the portfolio updated. The portfolio is actualized every year. With the goal of accountability over the results and insight into how the projects relate to the innovation challenges.

In the interviews, it became clear that the way in which the innovation coordinators manage and update their part of the portfolio differs per challenge. For the innovation challenge 'cooperation with the market' the ICM (procurement and contract management) department has put together a work group within the department. This group decides together which projects will run and also monitors these projects. For the innovation challenge sustainability, this works different. This challenge is run by the A&T (architecture and engineering) department for which the different there is a list with the different sub-challenges regarding the innovation challenge. For each sub-challenge, it indicates if it is being worked on, if it is almost solved, and projects that can be linked to this sub-challenge.

<u>Innovation practice</u>

In May 2022 the 'Innovatieschaal machine' was delivered in which five phases of the innovation process were thoroughly described and is aimed to be a tool to guide people in the innovation process, figure(2) displays the five phases. This 'innovatieschaal machine' describes the way in which the innovation process should go and not the way the innovation process is currently going. It is new in place and has not been implemented yet, in the current situation innovation projects do not necessarily follow or distinguish these five phases.
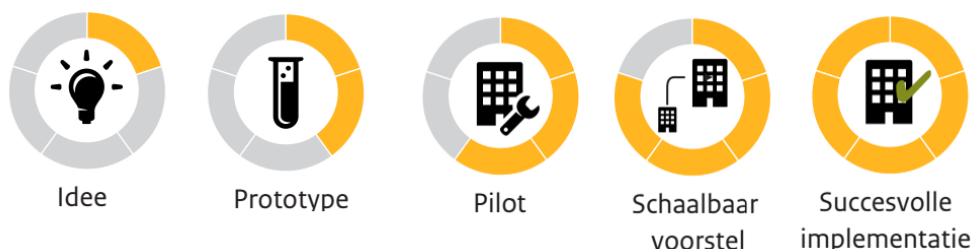
Figure 2 five phases of innovation as presented in the 'innovatieschaal machine'; idea, prototype, pilot, scalable proposition, successful implementation

The first phase of the 'innovatieschaal machine' is the idea phase. As it is described in the 'innovatieschaal machine' this phase consists out of the creation of a concept and matching this with a question, creating the core team, finding a podium, and making an approach. For the core team, it is desired to involve people from throughout the organization with different roles to push innovation and to scale up the process. In this team, people with knowledge and expertise on the subject of the idea should be included. A podium helps to create a support base for the innovation and idea. This podium can be created by embedding the innovation in the agenda, or by platforms like the innovation price or the knowledge sharing structures and events.

Based on the interviews, two types of innovations can be distinguished, bottom-up or top-down driven. The top-down innovations originate from the innovation agenda and the innovation challenge from where ideas for innovations are created to solve the questions that arise. Bottom-up innovations originate from employees coming up with ideas for innovation that are not directly related to the innovation agenda or challenge. For these ideas, it must first become clear how they can add to the innovation challenges. If ideas do not fit with the innovation agenda and challenge then the chances of them becoming successful are limited.

In the current situation, the hurdles were indicated in the interviews that were experienced during the idea phase. The first is that it is experienced to be difficult to find people with knowledge and expertise to involve in the further development of the idea or to add to the core team. This is due to a lack in overview who has knowledge and expertise at the RVB and where they are in the organization. *"if you then have to find someone somewhere, of okay I want to have someone who knows something about protected bird species, I have no idea where to start"* (interviewee 9). A second obstacle indicated is that some people have an innovative idea but are not sure what they can do with this idea. For them, there is a lack of overview on what the possibilities are what they can do with their idea, or what platforms to use.

The second phase that the 'innovatieschaal machine' describes is the prototype phase. It is described as the phase in which the first design of the idea is constructed. It consists of multiple components which are the creation of a use case, a stakeholder readiness level analysis, a feasibility study, the application possibilities, and ownership of the innovation. In

the creation of a prototype an inventory of the available knowledge is done, both documented and people with knowledge and expertise. For the ownership, a team is established around an innovation for the further development of the innovation.

How the 'innovatieschaal machine' describes this phase and the current situation are not yet the same. The main obstacle experienced as indicated in the interviews for this phase is with making an inventory of the existing knowledge. This is due to a lack of a centralized place where knowledge can be found at the RVB.

After the prototype of the innovation, the 'innovatieschaal machine' describes the pilot phase next. In this phase, the first design of the idea is tested to see if there is a potential for upscaling. After the pilot has been done the innovation is adapted based on the results of the pilot. With the modified innovation the feasibility study can be refined. The pilot phase also contains a risk and opportunity analysis for the upscaling of the innovation. For the pilot to move to a scalable proposition it must make sure that the pilot technology works, there is a support base from management, the risks are clear, there are enough financial means to enable upscaling, and there has to be enough knowledge and expertise within the organization to make upscaling possible.

After the pilot has been done the innovation is either adopted or killed. When the pilot is adopted the innovation can move to a scalable proposition following the 'innovatieschaal machine'. This scalable proposition is a version of the innovation that is ready to be widely implemented. For this, the implementation plan of the innovation has to be modified to reflect the lessons learned during the previous phases. The innovation has to become the new standard for the future. Therefore this new standard needs to be clearly documented and communicated. Communication is essential here to make clear that it is the new standard and to ensure that it will be applied.

A challenge that an interviewee experienced in communicating a new standard is the multitude of people that have to be reached. A new standard should not go to only the people who are involved with projects on a more theoretical level in the design of projects. There are a lot of people involved on a much smaller scale who work in the buildings for instance the maintenance. These people will not get reached with knowledge sharing events such as the knowledge week but have to be reached differently.

The final phase of the innovation process following the 'innovatieschaal machine' is the upscaling of the innovation. An innovation is only regarded to be successful when it is upscaled and implemented within the organization. Part of this is organizing training possibilities for people who are directly involved with the innovation to smoothen the implementation process. For the implementation and upscaling it is helpful that the lessons learned from the application of the innovation are shared. Sharing what went well and what did not go well can make the implementation more successful and prevent similar mistakes to be made more often. Further, it is important that the innovation is monitored to find possible bottlenecks so that they can be resolved. Appointing ambassadors for the innovation can help promote and boost the implementation of the innovation.

Various interviewees indicate that upscaling is a problem at the RVB, there are many pilots done but only a few of them go further than the pilot phase and form a new standard or go into production. One of the reasons for this is a risk-averse attitude to implement innovations into larger projects. Even if a pilot has proved to be successful, some project managers do not want to apply the innovation due to the larger risk associated with it compared to more conventional solutions.

"Relatively speaking we do a lot of pilots, relatively very few pilots we actually bring to production. so then I think of gosh, do we pay attention to good things, or why is it not possible to scale up or what is needed to scale up" (interviewee 5)

"That is what you hear from almost every interviewee, is that it's hard to change. That it is hard to get those innovations through. That it really depends on the individual who puts energy into it. And sometimes a piece of luck or a colleague who believes in it and goes for it. That may be a little more institutionalized. " (interviewee 6)

An aspect that is not institutionalized is the evaluation of innovation projects. Insufficient or no evaluation of projects hampers the creation of knowledge from innovation projects.

"When we talk about projects you see that for example evaluating projects and what have you learned from it is still not something that is commonplace. If I also look at the procedures that we have drawn up. then that is still a neglected feature" (interviewee 4)

"If you want knowledge sharing to have a structural place then it should actually also be part of that procedure, of the process, what is going on then. That way you get it into the standard and otherwise, it might remain something non-committal." (interviewee 3).

In the interviews, it was indicated that projects are evaluated in many cases. But the way in which it is evaluated and in which stage of the project it is evaluated is not something that is organized RVB wide and is therefore not part of the current innovation management. It is up to individuals how projects are evaluated, and the evaluation is not always done thoroughly enough, or not done at all. What the practice shows is that the knowledge that is obtained in projects remains with the people that were involved in the project.

<u>Innovation promotion</u>

An element of innovation management that is not discussed in theory, but what the interviews found to be prevalent at the RVB is the promotion of innovation within the organization. There are multiple structures in place to push innovation that were mentioned. But what the interviews also indicated is that the structure of how innovation management promotes innovation, how it is organized, and what the options are not clear to everyone. It was indicated that some people have innovative ideas but are not sure where to go with these ideas or can not find a project to apply the idea. Initiatives like the innovation price and PGI are not always found by RVB employees.

"There is still something missing, that people often have a good idea but then don't know how to find the project to apply it. […] … of PGI has a budget, not everyone knows where to find it, someone who is on a project needs to know that he can find this and say, "Hey, I've got a great innovation for you. I'm going to get money from … and then we're going to apply that. If you know how to make a good link and complete the procedure, then I think you can do very nice things." (Interviewee 9)

One of the structures for the promotion of innovation at the RVB that is often mentioned is the innovation prize. In an internal news report (document 6) this platform was further explained and information was given on the winners of the year 2021. The innovation prize is an annual competition that is open to employees of the RVB to stimulate the development of new and innovative ideas and to advance an innovative culture at the RVB. The winner of the competition is rewarded with 25.000 Euros to further develop the idea.

The winner of the innovation prize is decided by a vote among RVB employees. They can vote on innovations that are nominated by the jury, which nominates innovations based on five criteria. These criteria are that the innovation should add to the RVB innovation agenda, the extent to which they have a positive effect on the users of RVB buildings, the social added value, impact, and feasibility of the innovation within the RVB. One of the winners of the innovation prize in 2021 was the concept 'Dubbel Duurzaam' with the idea of putting a vegetation roof below solar panels on the roof. Which is good for the biodiversity and cooling of the building. For this idea, there was a bottleneck, which was that it was not proven to be fireproof. With the money obtained by winning the prize, a study will be done on the fire safety of this innovation. Besides the money that can be won with the prize it also gives a podium to innovative and new ideas.

4.3 Current alignment KM and IM

The current alignment of knowledge management and innovation management at the RVB is according to the design displayed in figure(3). In this section of the findings, the different alignments between knowledge management and innovation management are discussed. First, the links from knowledge management to innovation management will be discussed, and subsequently the other way around.
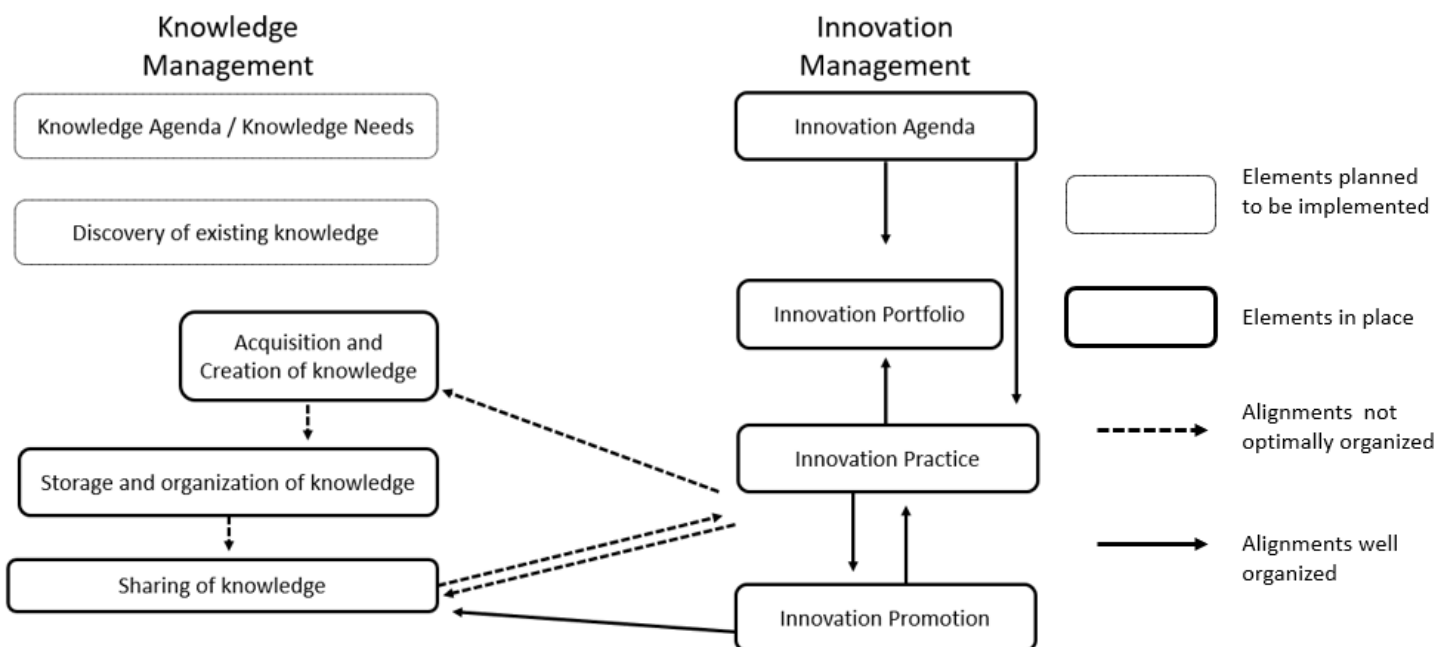

Figure 3 Current alignment of knowledge management and innovation management at the RVB.

The alignment between knowledge management and innovation management

Sharing of knowledge to innovation practice

The first connection between knowledge management and innovation management is between knowledge sharing and innovation practice. In the first phase of innovation practice, the idea phase, the 'innovatieschaal machine' procedure in place prescribes that a core team has to be established. Literature indicates that for a team people with expertise and knowledge are required, knowledge sharing should offer a way in which these people can be found and mobilized (Mackenzie Owen, 2001). In practice, this proves to be difficult, largely due to the RVB being perceived as a where contact among employees is dominated through personal networks. This makes it easy for RVB employees to find and approach people that are in their own informal network. If they need someone with knowledge and expertise that is not directly in their own informal network it proves to be difficult to find those people. This is especially difficult for people who have a limited network in the organization.

The 'innovatieschaal machine' procedure prescribes that in the creation of a prototype an inventory is done of the existing knowledge relating to the innovation. This requires the sharing of both explicit knowledge and tacit knowledge. In practice, this is done through people's own network. People involved with an innovation project ask people in their network if they have either documents on the subject or if they know someone with knowledge on the subject. The result of this is that relevant explicit knowledge is often not found due to the lack of a database where it could be easily found. People with relevant knowledge and expertise are also often not found due to it being unclear where these people are within the organization if they are not inside their own informal network.

For the pilot phase of innovation practice, a condition for the pilot going to a scalable proposition as prescribed by the 'innovatieschaal machine' procedure is that there has to be enough knowledge and expertise in the organization to make upscaling possible. Similar to the prototype phase this requires the sharing of both explicit and tacit knowledge, which comes with the same problems regarding finding both types of knowledge.

In the upscaling phase of innovation practice, the standards that were created in the scalable proposition phase and the lessons learned from the application of the innovation

have to be shared so they can be implemented in various situations. In the current situation, this is not the case which is due to the lack of standards that are being created and the limited evaluation of innovation projects.

Based on the alignment between knowledge sharing and innovation practice discussed for the multiple phases of innovation projects it can be said that this alignment is not properly organized yet. This is depicted in figure 3 with a dashed line between knowledge sharing and innovation practice.

The alignment between innovation management to knowledge management

<u>Innovation practice to knowledge creation</u>

With innovation practice, knowledge is created during different phases and on a wide range of matters, including practical matters like circular inner walls, but also knowledge on work processes, the tender process, or lessons on the innovation process. It is important that this knowledge is acquired so people can build further on the created knowledge and that it can be used to upscale the innovation. Currently, the alignment between these two elements is not properly organized.

The 'innovatieschaal machine' procedure prescribes that in the scalable proposition phase of innovation practice a new standard is created. This newly created standard has to be acquired so it can be stored and later retrieved for it to be applied in other cases. The same goes for the lessons learned during the implementation and upscaling of innovation. It is important that this knowledge is acquired on the knowledge management side in a manner that is accessible and can be used further on, as one of the interviewees mentioned;

"That is also one of the things, of course, it has to be retrievable. everything that people have in their heads is nice, but it is very difficult to access. so as far as that is concerned, many more things also have to be made explicit in the context of upscaling. how do you deal with knowledge and experience and make sure that the public uses it." (interviewee 4)

In practice, the alignment between innovation practice and knowledge creation is not yet well organized. The most prominent reason mentioned in the interviews for this is a lack of organization in the evaluation of innovation projects. This results in a big difference in the way and the extent to which projects are evaluated and therefore how knowledge is

captured and how much knowledge is captured. Without good evaluation, it is difficult to acquire the knowledge created in a project and to store and organize this knowledge.

The knowledge that is obtained from projects often remains tacit and stays with the people that were involved with the project. As one of the interviewees mentioned; *"it (the knowledge) is in the minds of the individuals who were involved. That's it, I think"* (interviewee 5). This makes this knowledge hard to access for a wide audience. Interviewees indicate that within the RVB it is difficult to find people with knowledge or expertise. The risk is that valuable tacit knowledge created in innovation projects is difficult to trace and therefore can not be used in further projects or for the upscaling of the innovation.

Innovations don't occur in places that are directly linked to knowledge lines. Interviewees involved with innovation projects indicate that it can be unclear where the knowledge obtained from innovation projects should land on the knowledge management side. If it is unclear where and how knowledge should land the chances are high that the knowledge created does not land where it is supposed to land. There is a lack of an overview on how created knowledge should be handled or who to involve (e.g. knowledge coordinators). This impairs a good alignment between innovation practice and knowledge creation. This is depicted in figure 3 with a dashed line between the two elements.

<u>Innovation practice to knowledge sharing</u>

The knowledge sharing element offers the possibility to share knowledge, information, and ideas through multiple knowledge sharing events including the knowledge week and knowledge indoor. There is a relation between multiple phases of innovation practice and knowledge sharing. In the first phase of innovation practice, the idea phase, it is good to have a support base for the idea that one wants to push through. Giving an idea a podium through the knowledge sharing events brings the idea to the attention of people whose support is required or requested.

In the scalable proposition phase of innovation practice, a new standard is created based on a successful pilot. This new standard needs to be communicated so people know that this is the new standard that needs to be used. The knowledge sharing events offer a good possibility for the sharing of this new standard and therefore help to align knowledge management and innovation management.

In the interviews it was indicated that it is not always clear what the knowledge sharing events are or how they can be approached. Due to this the alignment between innovation practice and knowledge sharing is not sufficiently organized yet. This is depicted in figure 3 with a dashed line between innovation practice and knowledge sharing.

<u>Innovation promotion to knowledge sharing</u>

An interviewee indicated that in the current situation the knowledge week is used to promote innovation. During this knowledge sharing event, workshops are given about innovation management and used for communication about innovation management. From this, it can be concluded that there is already an alignment between innovation promotion and knowledge sharing. This is depicted in figure 3 with a solid line between these two elements.

5. Conclusion

This chapter is aimed at answering the research question of this thesis on how knowledge management and innovation management align within the Rijksvastgoedbedrijf and how can this alignment might be improved. Since this question constitutes two parts this chapter is also divided into two. The first part provides an answer to the research question on how knowledge management and innovation management are aligned within the RVB. The second part will answer the question of how this alignment can be improved. The improvement part will be subdivided into recommendations on the knowledge management side and recommendations on the innovation management side.

5.1 Current alignment of knowledge management and innovation management at the RVB

Currently, there is a lot of work being done at the RVB on knowledge management, innovation management, and the alignment between these two. Organization-wide knowledge management is relatively new at the RVB. The implementation of this started in October 2021 with the appointment of the knowledge manager. At the end of 2022, there is a knowledge agenda coming to direct the focus of knowledge management and knowledge audits will be held to inventory knowledge present at the RVB.

Innovation management has been implemented at the RVB since 2020. In may 2020 the innovation agenda was published to steer innovation at the RVB and highlight the five most important innovation challenges for the RVB. For each of these challenges, there is an innovation coordinator appointed to oversee the progress on this challenge and the portfolio linked to the challenge. For the innovation practice, there is a new tool developed and presented in May 2022 to aid RVB employees to upscale and implement innovative concepts and innovations themselves. This tool acts as a guide to help people through the whole innovation practice process from idea to implementation. Since this tool is developed very recently it has not been implemented in the organization yet.

An alignment between knowledge management and innovation that is already in place is between innovation promotion and knowledge sharing. The knowledge sharing events are currently used for the promotion and communication of innovation management.

The alignment between innovation management and knowledge management at the RVB is not yet optimally organized. The main links between the two are between the sharing of

knowledge too innovation practice, innovation practice too the acquisition of knowledge, and innovation practice too sharing of knowledge. There are bottlenecks with both types of management that impede the alignment.

The empirical results indicated multiple bottlenecks that hamper the optimal functionality of knowledge management elements and the alignment between knowledge management and innovation management. The first bottleneck on the knowledge management side regarding the alignment between knowledge management and innovation management is the lack of overview and traceability of tacit knowledge. Various interviewees indicate that they perceive it to be difficult to find people with knowledge and expertise outside of their own informal network. This is problematic during multiple stages of innovation projects when expertise on a subject is required. The second bottleneck is the lack of a centralized platform for the organization and storage of explicit knowledge. There is a multitude of platforms that can be used for the storage and sharing of knowledge which has a negative influence on the overview of knowledge present and the sharing of explicit knowledge. These first two bottlenecks hinder the alignment between the sharing of knowledge too innovation practice. The third bottleneck is in that the knowledge management structure is not sufficiently clear. It is not fully clear what the knowledge coordinators do, where knowledge should land, and what knowledge sharing structures and events there are. This bottleneck hinders the alignment between innovation practice and the acquisition of knowledge and between innovation practice and the sharing of knowledge.

On the innovation management side, there is one main bottleneck concerning the alignment between knowledge management and innovation management, which is in the evaluation of innovation projects. The lack of management of the evaluation process results in a big variety in the extent to which projects are evaluated, how much knowledge is captured, and how much knowledge is made explicit. This negatively impacts the possibility of knowledge obtained in an innovation project being used later on and therefore the upscaling of the innovation. This bottleneck hinders the alignment between innovation practice and the acquisition of knowledge.

5.2 Recommendations to improve the alignment between knowledge management and innovation management at the RVB

From the empirical results, bottlenecks were reviewed which hamper the alignment between knowledge management and innovation management at the RVB. In this section, recommendations will be given for both knowledge management and innovation management to improve the alignment between the two. These recommendations are made based on literature and empirical results. In figure(4) a new design for knowledge management and innovation management at the RVB is proposed.
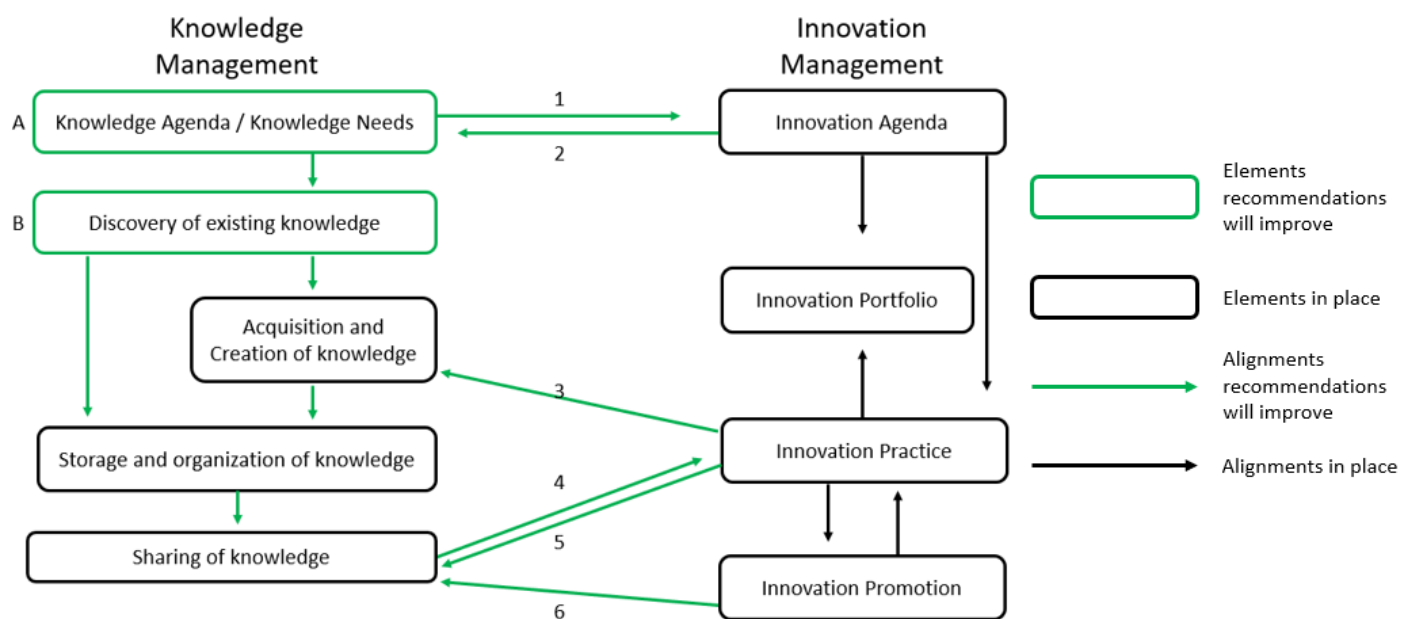

Figure 4 New design knowledge management and innovation management. The numbers 1-5 relate to the alignment between different elements, the letters A and B relate to elements, these will be mentioned further in the recommendations.

5.2.1 General recommendations

For both knowledge management and innovation management there is a general set of recommendations to consider for the implementation of changes. The first general recommendation is to focus on the people that are involved and are meant to make use of new processes or products. For effective management, people have to be stimulated, attracted, and encouraged to engage since they are an important factor in the success of any implementation (Prajojo et al. 2006; Iguarta et al. 2015). The second recommendation is to further strengthen the structural embedment of innovation and knowledge management in the organization. Establishing formal processes positively influences the efficiency of innovation projects and aid in the acquisition and storage of knowledge (Abador et al., 2019; Adams et al. 2006; Viki et al., 2019). The main focus of the recommendations is on the

structural side. This is because the results show that the main bottlenecks hampering the alignment between knowledge management and innovation management were structural.

5.2.2 Recommendations for knowledge management
<u>Recommendation 1: Put knowledge management more on the map at the RVB.</u>

The first recommendation for knowledge management is to increase the awareness of knowledge management within the RVB. Based on the interviews and the survey it became clear that not everyone knows how knowledge management is organized at the RVB, who are involved, what the role is of the people involved, and what knowledge management can add to the RVB. Literature indicated that a lack of clear structure adds to the risk of created knowledge not being added to the knowledge base of an organization (Gold et al. 2011). This is also a risk at the RVB since the structure of knowledge management is not sufficiently clear to all RVB employees, which is not difficult to understand considering that knowledge management is relatively new at the RVB.

To reduce this risk there are a couple of improvements that can be made. Firstly, the recommendation is for the knowledge manager and knowledge coordinators to create a clear structure for organization-wide knowledge management. In this, it has to be made clear for the knowledge coordinators and knowledge managers what the role is of the knowledge coordinators, what their responsibilities are, and for what matters they can and should be approached. With an eye on the alignment with innovation management to clarify how the different knowledge lines relate to the innovation challenges. The creation of an infographic of the structure would be beneficial since a visual tool allows for a better and faster transfer of information. Second, this clarified structure has to be communicated throughout the organization. For this, it is recommended to put the structure on the knowledge management page on the website so it can be used as a reference for further communication. For further organization-wide communication, a message or sharing the infographic in the RVB newspaper can be used with further reference to the website. Second, knowledge coordinators can communicate the structure in meetings in their knowledge lines.

The second recommendation is to increase the publicity for the knowledge sharing events within the RVB. For this, it is important to make clear what events there are, what these

events entail, when they are, and how one can enroll for these events to share their knowledge. By doing this it becomes easier to share knowledge from innovation projects and would strengthen the alignment between innovation practice and knowledge sharing, and between innovation promotion and knowledge sharing (alignment 5 & 6 in the design). For the upscaling of an innovation, training can be given to people who are supposed to implement the innovation about how the innovation works and how it can be applied in the RVB. Training can be done either in association with the RVB academy or through workshops given at knowledge sharing events like the knowledge week.

The second alignment between innovation practice and knowledge sharing is through the knowledge sharing events creating a podium by which the innovation can be promoted to boost the implementation of the innovation at the RVB. This podium can be created with events like the knowledge week and knowledge indoor. For these alignments communication about the different events is critical. The events that are offered are ongoing and therefore require ongoing communication to promote and inform on practical matters (e.g. when and how you can enroll). One way of doing this is making use of the RVB newsletter since in this way a large audience can be reached. The messages in the newsletter should be kept short and to the point. It must immediately be clear what the events are, when they are, and how to enroll. The second recommendation is to promote knowledge sharing events through meetings. The knowledge manager can inform the knowledge coordinators on the events from where they can promote and inform on the event further in meetings within the knowledge lines they operate in.

The knowledge agenda will be presented in the second half of 2022 which will provide an organization-wide focus on knowledge management (element A in the design). It will become more clear what knowledge management is and what it stands for at the RVB. It will also improve the alignment between knowledge management and innovation management since the knowledge agenda will be influenced by the innovation agenda (alignment 2 in the design). To properly roll out the agenda organization-wide the recommendation is to thoroughly communicate it directly when it gets launched. For this simultaneous communication methods can be used. A launch event at one of the knowledge weeks, presentations in various meetings by the knowledge manager and coordinators, and an article in the newsletter.

Recommendation 2: organize storage and sharing of tacit knowledge

An aspect of knowledge management that can be improved is the storage and sharing of tacit knowledge. Currently, there is a lack of overview of which knowledge and expertise are present at the RVB or where this knowledge and expertise is within the organization. This impairs tacit knowledge from innovation projects being used in the future and the sharing of already existing tacit knowledge to innovation projects.

The sharing of tacit knowledge is essential for an organization's capability to innovate, especially in situations where there is limited explicit knowledge available. Knowledge management can help in accessing tacit knowledge and the codification thereof (du Plessis, 2007).

For the storage and accessibility of tacit knowledge, the structural component of the recommendations is to make an overview of the tacit knowledge and expertise that is present at the RVB, either with a tool or through a platform. There is a tool at the RVB called the 'guru scan' that has not been implemented yet due to privacy issues. This tool allows people to look for colleagues with certain expertise or knowledge and see from these colleagues their position and other colleagues that work on the same theme. Due to privacy issues, it is not clear if this tool will be implemented in the future. If this tool can not be implemented the recommendation is to look for an alternative to make the tacit knowledge clear. This could be through an online platform where people have to fill in themselves what their expertise is and what they are working on. For this to be successful people have to be stimulated to do so. A recommendation to accomplish this is to appoint coaches, ambassadors, or people from marketing to motivate people to fill it in and keep it updated. They should assist people if needed to show to fill in and update their expertise and make a short informative movie on how to do this. In their message, it should convince people that filling in their expertise is also for their own benefit because they can more easily find people and be found by others. The lack of overview was often mentioned in the interviews, pointing out to employees that filling in their expertise can solve this problem will motivate them to do so. It is also recommended to involve management letting them stress the importance of filling your expertise and addressing it if people do not do it. Another way is through extrinsic motivation by rewarding people to fill in their expertise with for instance a voucher for the coffee lounge.

Besides structural recommendations, there are also recommendations focusing on the interaction among people to share knowledge. There are already events in place to do so, like the knowledge weeks and knowledge indoor. A recommendation to further facilitate the interaction of people is through establishing communities of practice, this will be further elaborated in the third recommendation for knowledge management.

By making the tacit knowledge infrastructure at the RVB visible and accessible the alignment between knowledge management and innovation management would improve on two fronts. The alignment between innovation practice and knowledge creation would improve since the tacit knowledge that is created during innovation practice would be clear where this knowledge has landed within the organization (alignment 3 in the design). The alignment between knowledge sharing and innovation practice would also improve due to it being clear where tacit knowledge is and it being accessible for innovation projects (alignment 4 in the design).

Recommendation 3: Establish and facilitate communities of practice

A recommendation for sharing tacit knowledge is through establishing communities of practice (CoP). These can be defined *as "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly"* (Wenger, 2011). With collaboration knowledge sharing communities can be formed to cooperate in achieving shared objectives. These communities can be both within organizational boundaries and outside these boundaries (du Plessis, 2007). Collaborating with people with the same concern and with knowledge and expertise is a way to retrieve knowledge by interacting with each other (Adobor et al. 2019). A variety in the background of people collaborating results in more innovative ideas (Adams et al. 2006). Collaboration is an important way of sharing tacit knowledge. Collecting tacit knowledge from other parties can reduce risk in projects by ensuring that things are done with the right approach, and therefore establishing effective innovation (du Plessis, 2007). Knowledge management can be used to promote collaboration, both internal and external, to support innovation.

The recommendation is to facilitate the sharing of tacit knowledge for the innovation process with the creation of these CoP's around certain topics related to innovation (e.g.

circularity, sustainability). As these topics are now dispersed over different knowledge lines, which makes the sharing of knowledge on these topics more difficult. Cop's can cross the borders of the knowledge lines and bring tacit knowledge from different knowledge lines together.

In CoP's the emphasis is often more on the transfer of tacit knowledge than on raw data and information, as a communication network brings experts/talent together (Sveiby, 2001). Technological platforms can be used to allow knowledge sharing within online knowledge sharing communities, such as online discussion forums (du Plessis, 2007). An advantage of online collaboration forums is they ensure that knowledge is codified, both as input and output. It makes knowledge accessible and it identifies the collaborators together with the expertise that they have and where this knowledge is located within the organization (du Plessis, 2007).

The recommendation for CoP's is because they can help in crossing boundaries between knowledge lines and departments. New standards can in that case be set in the same manner for different knowledge lines and departments. In this way, the risk would be mitigated that different departments or knowledge lines have conflicting standards, as was indicated by an interviewee. For the possibility to set new standards, the CoP's have to be connected with line management. Participation is essential for the CoP's to work. What this means is that for CoP's to succeed the RVB and its employees have to commit. A way to facilitate this is by appointing community managers to the CoP's who make sure that people participate and respond to each other in the community.

With CoP's the alignment between knowledge management and innovation management would improve due to CoP's offering a place for tacit knowledge from innovation projects to land in the organization (alignment 3). In addition, CoP's offer a place for sharing tacit knowledge to be used in innovation practice, improving the alignment between sharing of knowledge and innovation practice (alignment 4).

Recommendation 4: integrate platforms into one single platform for storage of explicit knowledge

Innovation builds on existing knowledge and recombines this to create new knowledge (Adams et al. 2006). Knowledge management can assist in this process by making explicit

knowledge available and accessible as input to the innovation process (du Plessis, 2007). The organizational form or structure is a strong determinant of its knowledge processing activities. Departmentalization can have a negative influence on knowledge processing because departments may be focused on accomplishing their own goals rather than the overall goals. It also tends to create a narrow compartmentalized view (Zheng et al. 2013). Therefore acquired knowledge should be stored centralized knowledge base and not by one department to prevent a narrow view of the knowledge acquired. Integration of different information systems/sources of different sections increases the accessibility of the total knowledge, which ensures that all relevant information and knowledge can be localized (Mackenzie Owen, 2001).

Currently, there are five platforms in use at the RVB on which knowledge can be stored. The survey showed that it depends on the person or the team they operate in which platform they use. Explicit knowledge is therefore scattered over these different platforms and hard to trace and share. The recommendation is to move to one single platform on which knowledge can be stored and shared. As the literature indicates, the integration of platforms leads to better accessibility and localization of knowledge. Either a new platform can be created or a decision has to be made on which of the platforms in place to use as a collective. By doing so the alignment between the sharing of knowledge and innovation practice will improve (alignment 4). After a transition period in which RVB employees switch to the selected platform, the other platforms can be abolished which will, in turn, lead to a cost reduction in the upkeep of the other platforms. This recommendation does require organizational support from higher management in order for it to become reality.

5.2.2 Recommendations for innovation management
<u>Recommendation 1: Organize the evaluation of innovation projects.</u>

For innovation management, one of the recommendations is to institutionalize the evaluation of innovation projects. Currently, the evaluation of innovation projects depends on the people that are involved with the projects. This results in dissimilarities in the way and the extent to which innovation projects are evaluated, and ultimately in differences in the amount of knowledge that is captured from innovation projects. Literature indicates that the creation of knowledge and its documentation should be prescribed in formal

processes as this positively influences efficiency. Leadership or top management should stress the importance of knowledge creation and documentation (Adams et al., 2001).

Institutionalizing the evaluation of projects and how the interpretation thereof will not be up to individuals and will assure that all innovation projects get properly evaluated. Second, institutionalizing evaluation in a common evaluation format will positively influence the efficiency since it will be clear how to evaluate projects. Literature indicates that a common format of knowledge also aids the accessibility of explicit knowledge (Gold et al., 2001).

One of the recommendations for the evaluation of the innovation projects is to make the tacit knowledge that is created during innovation projects explicit to increase the accessibility of this knowledge. One way of documenting tacit knowledge is by having a team member involved in the innovation project document experiences from projects, including which team members were involved and what the reaction of others was. This procedure is successfully applied by large consulting firms such as McKinsey and Bain & Co (Sveiby, 2001). It is important that people involved in the process reflect on the externalized knowledge so that the knowledge created is a collective interpretation (Adobor et al. 2019). By documenting who was involved with the project, the tacit knowledge that can not be externalized can be accessed by involving these individuals in other projects or other forms of learning like socializing or dialogue.

The second recommendation for the evaluation is institutionalizing the creation of a knowledge dossier during innovation projects. For every type of expertise that is involved in the project, there should be an expert responsible for writing down the lessons learned throughout the project. Together these lessons learned make up a knowledge dossier for the project. The experts who make up the knowledge dossier are in direct contact with the knowledge lines that are aligned with their expertise. In this way, the innovation project is connected with the different knowledge lines. Evaluation should happen after each stage of the innovation project to capture the knowledge and lessons learned at each stage. If evaluation would happen only at the end of a project, the risk is that a lot of this knowledge is lost. Besides this, evaluation throughout the project breaks the evaluation into smaller tasks reducing the perceived work the evaluation process takes. This form of evaluation is the recommendation due to it being able to externalize tacit knowledge, the connection with the knowledge lines, and because the evaluation happens throughout the project. By

organizing the evaluation of innovation projects the alignment between innovation practice and knowledge acquisition will improve (alignment 3).

The third recommendation is about stimulating people to evaluate innovation projects. Institutionalizing the evaluation process will already make sure that it is done since it is formally prescribed. Evaluating projects might not be an aspect of projects that people are too enthusiastic about therefore it should be made as easy as possible. The recommendation is to create an e-learning program to help people with the evaluation procedure. Such a program can guide them through the process and should eliminate potential barriers. A recommendation is to involve the people that have to evaluate in creating the final format for the evaluation of innovation projects. This should indicate what they find important in the evaluation process and tailoring this process to their needs can help motivate them to evaluate the projects. Another recommendation is to thank and congratulate people when projects are evaluated well to motivate the people responsible for evaluating. This can either be done by the manager responsible for the project or by the innovation coordinators overseeing the innovation challenge that the project is linked to.

<u>Recommendation 2: Put innovation management more on the map at the RVB.</u>

The second recommendation for innovation management is to increase the awareness of innovation management and the possibilities that it offers. It is important to make clear what possibilities there are such as the innovation price and the PGI program and how to participate. By doing this innovative ideas can be utilized and it will further promote an innovative culture at the RVB. A key feature in raising awareness is organization-wide communication of what innovation management is and the events. The structural recommendations here are similar to recommendation 1 of knowledge management. The recommendations for this are to make use of the RVB newsletter, to create a knowledge and innovation newsletter, promote in meetings, and to make use of announcements on an online platform.

Besides the structural recommendations, it is recommended to stimulate people to participate in the events. A recommendation for this is to spotlight the successes of the people that participated in the previous innovation price events. Showing that someone's innovative idea can become reality can motivate people to put in their idea and participate

in the competition. Showcasing previous successes can be done by publishing an article about it in the organization-wide newsletter together with information on how to participate. A second manner is by making a short video about one of the innovations applied that resulted from the innovation price, as people might be more inclined to watch a video than read an article.

<u>Recommendation 3: Innovation agenda and knowledge agenda.</u>

The knowledge agenda that will be released in July 2022 will be influenced by the innovation agenda. The innovation agenda as it is today is not influenced by the knowledge agenda. To further improve the alignment between innovation management and knowledge management the recommendation is to also use the knowledge agenda as input for the innovation agenda. The knowledge agenda can influence the innovation agenda by indicating which aspects that come forward from the RVB strategic goals there is already knowledge available and for which knowledge is lacking, and where innovation can play a role in filling the knowledge gaps where knowledge is lacking. By doing this an alignment between the innovation agenda and knowledge agenda will be formed (alignment 2).

6. Discussion

In the final chapter of this thesis, the limitations of this study will be discussed in the first section. In the second section recommendations for further research will be presented. In the final section, a theoretical reflection will be presented.

6.1 Limitations of the study

One of the limitations of this study is in the selection of the respondents for the interviews. The respondents have been selected based on recommendations from the supervisors at the RVB, which are the innovation manager and knowledge manager of the RVB. The respondents are all people from their personal network at the RVB and are therefore directly linked to innovation and knowledge management. The selection of interviewees might therefore not be completely representative of all people working at the RVB that are dealing with knowledge and innovation management.

A second limitation of this study is the generalizability of the results. There is limited literature in which knowledge management and innovation management are combined. For this study to add to the knowledge on the alignment between knowledge management and innovation management it would be good if the study is generalizable. Due to the specific context of the RVB which has been studied here the generalizability is limited. At the RVB there is already a structure in place for how knowledge management is managed, with knowledge lines and knowledge coordinators, as well as for innovation management. The results on the alignment between knowledge management and innovation management and the recommendations given reflect this structure.

The third limitation is due to the recent developments in knowledge management and innovation management at the RVB. Currently, a lot of work is already done to improve the alignment between the two. With the work that is being done some of the bottlenecks indicated in this study might already be solved when this study is published which would make some of the recommendations redundant.

6.2 Theoretical reflection

From the literature, five different elements were distinguished for both knowledge management and innovation management. The results of this research confirm the literature on knowledge management by showing that these five elements are in place or are planned to be implemented by the end of 2022 at the RVB.

Of the five elements that were distinguished from literature for innovation management (Adams et al. 2006; Viki et al., 2019; Igartua et al., 2015; Oke, 2007) only three of them were found to be prevalent at the RVB. The innovation framework element as described by the literature (Adams et al. 2006; Viki et al., 2019) is about creating a framework to manage the innovation process. In practice, the innovation framework and the innovation practice element, the development of innovations, are intertwined. A framework to manage the innovation process seemed to be part of the innovation practice. Therefore, the innovation framework element is not seen as a separate element at the RVB but as part of the innovation practice element.

The second element which was not found at the RVB is innovation accounting, concerning measuring the success of innovation, because it has not been implemented yet. Most literature on innovation management is centered around private organizations (e.g. Adams et al. 2006; Viki et al., 2019; Igartua et al., 2015). The RVB is a government organization and does not have shareholders to which they are held accountable. As a government organization, the RVB is held accountable to the public and is held accountable by the House of Representatives. Therefore, the accountability mechanisms might be different for the RVB than the accountability mechanisms discussed in the literature on innovation management by Adams et al. (2006), Viki et al. (2019), and Igartua et al. (2015) since it might be more focused on the public value added by innovation instead of monetary value.

The results of this research supplement literature by indicating an element of innovation management that is not distinguished in literature, innovation promotion. This element, concerning the promotion of innovation within the organization and managing the structures to do so, is prevalent and appears to be an important aspect of innovation management at the RVB. Based on the results one could argue that this element should be added to the theory on innovation management.

This research also adds to literature by combining the elements of innovation and knowledge management and discussing how these elements align. Literature on knowledge management and innovation management generally is focused on either one of the two (e.g. Adams et al. 2006; Viki et al., 2019; Igartua et al., 2015; Adobor et al. 2019; Gold et al. 2001), literature combining the two is limited. Because of this, it is hard to make a

comparing analysis of the results with literature on the alignment between knowledge and innovation management.

6.3 recommendations for further research

To address the first limitation of the study a recommendation for further research would be to interview more people who are outside the network of the knowledge or innovation manager. By doing this the goal is to get a more representative sample of the people at the RVB involved with knowledge and innovation management.

A second recommendation is to study more cases in which knowledge management and innovation management are present. This is to see if in those cases the same factors are deemed to be important for a good alignment between the two. If this is the case, it would make the study more generalizable. In this research, an innovation management element was added to the elements found in the literature. Further research should be done to examine if this element is also prevalent in other cases. In order to examine the generalizability, the recommendation is to do a comparative case study because by analyzing the similarities, differences, and patterns between multiple cases, the alignment and the causal factors influencing the alignment can be studied. This would require several cases in which both knowledge management and innovation management are present that slightly differ from each other. Since this study was done at a public organization it would be interesting to include cases from the private sector.

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Appendix A – Overview respondents and documents

Interviewee list

Interview code	Organization	Position within organization	Date	Length Interview
Interviewee 1	Rijksvastgoedbedrijf	Innovation professional	21-04-22	47 minutes
Interviewee 2	Rijksvastgoedbedrijf	Knowledge professional	16-05-22	47 minutes
Interviewee 3	Rijksvastgoedbedrijf	Innovation professional	13-05-22	63 minutes
Interviewee 4	Rijksvastgoedbedrijf	Knowledge professional	09-05-22	54 minutes
Interviewee 5	Rijksvastgoedbedrijf	Program manager	04-05-22	39 minutes
Interviewee 6	Rijksvastgoedbedrijf	Knowledge professional	29-04-22	45 minutes
Interviewee 7	Rijksvastgoedbedrijf	Head of department	18-05-22	31 minutes
Interviewee 8	Rijksvastgoedbedrijf	Knowledge professional	10-05-22	47 minutes
Interviewee 9	Rijksvastgoedbedrijf	Innovation professional	17-05-22	40 minutes
Interviewee 10	World Wide Fund for Nature	Knowledge professional	09-05-22	53 minutes
Interviewee 11	Rijksvastgoedbedrijf	Advisor sustainability	24-06-22	32 minutes

Overview documents

Document number	Document
Document 1	Dialogic. (2021). Innovatieschaal machine aanpak offerte
Document 2	Rijksvastgoedbedrijf (2020). Innovatieagenda 2020 -2023
Document 3	Rijksvastgoedbedrijf (2020). Innovatie agenda & innovatiestrategie Rijksvastgoedbedrijf 2020 -2023
Document 4	Rijksvastgoedbedrijf (2022). Jaarplan Kennismanagement
Document 5	Rijksvastgoedbedrijf (2021). RVB Innovatieprijs naar natuur-percentageregeling en vegetatie onder zonnepanelen
Document 6	Dialogic (2022). Innovatieschaalroutes
Document 7	Dialogic (2020). eindreportage evaluatie programma groene innovaties
Document 8	Dialogic (2022). Interviewverslag opschaling RVB 31/03/2022