How to empower organisations to improve their effectiveness of innovation implementation

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Master thesis

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Acknowledgement

This thesis is my final contribution as a student at the faculty of IDE at the Technical University in Delft. The journey has been extensive, but worth it. I have developed from a young student to an academic and developed skills that will stay with me for a length of time.

During this project, I have combined my passion for design and organisational improvements to find a solution for something that, in my opinion, is quite the prominent issue. During this time I have had the opportunity to talk with many practitioners who not only provided me with insights in their work, but also assured me of the urgency of my work. This has pushed me to finalise a document to be proud of.

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This has been the end of my 'studenten periode'. Thank you all and enjoy my final contribution.

Thanks, Annemeike

Executive summary

Innovation implementation is known to pose significant challenges, as evidenced by high failure rates that can range from 20% to 90%. This issue became particularly apparent during my internship, where I witnessed firsthand the complexities involved. Implementation involves activities that aim to equip organisational members with the necessary skills, consistency, and commitment to effectively use a new innovation that is designed to address specific problems. This raises the question: Is the failure attributed to the innovation itself or the activities associated with its implementation?

The purpose of this thesis is to investigate how organisations can improve the effectiveness of innovation implementation. To achieve this, a combination of qualitative research and literature review are conducted, diving into the field of implementation science. Insights from practitioners regarding implementation processes are combined with relevant literature to identify the important causes of implementation failure.

Following the Design Science Research methodology, two artefacts were developed. The first artefact focuses on refining a widely used framework among practitioners, aiming to enhance its effectiveness. The second artefact addresses the evidence-practice gap, which highlights the disconnect between theoretical knowledge and practical application. This artefact synthesises the findings of the study to improve implementation practices.

Ultimately, the goal of this thesis is to enhance innovation implementation by providing practitioners with two artefacts that integrate comprehensive insights from both research and practice. These contributions are intended to support organisations in overcoming the challenges associated with innovation implementation and achieving greater success.

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Introduction

01

1.1 Introduction to implementation of innovations

During my internship at a Dutch health insurance company in the department of Strategy and Business Development, I came across an interesting topic. The team was in the early stages of implementing the innovation funnel into their daily way of working. It was clear that daily activities were still progressing as normal, and it wasn't clear to everyone in the team what was expected of them regarding this new innovation funnel. The innovation funnel itself has been tested many times before and has proven to be an effective tool for driving technological innovation (Herbig & Howes 1996). However, this organisation still struggled to gain the full potential of this new 'thing' they were supposed to work with.

It makes you wonder why implementing innovations in an organisation is such a difficult task. Within any company, there is a desire to stay ahead of the market and improve the business. They attempt to do so by identifying issues within the company, such as efficiency problems or a desire to not be environmentally friendly, and finding innovations that meet their needs to address these problems.

An innovation is generally something that is (somewhat) new to its developers and/or potential users (Klein & Knight, 2005). It can consist of a product, service, program, or technology, for example. However, simply acquiring the innovation is not enough; the organisation needs to implement it. Implementation, as defined by Klein & Sorra (1996), is "a period of activities and practices in which the targeted employees become more skilled, consistent, and committed in using the innovation." Implementation begins when the decision to adopt the innovation is made and ends when the innovation is in routine use. Adoption is the decision to acquire an innovation (Klein & Knight, 2005). The goal of the implementation project is to have specific individuals within the organisation consistently using the innovation to achieve the intended goals.

The fields of implementation research and implementation science focus on studying the phenomenon of implementing innovations (Nilsen & Birken, 2020). These research groups have provided insights into implementation failures and developed frameworks for implementation. However, in practice, organisations still struggle and frequently fail. Implementation fails when employees do not use the innovation as frequently, consistently, or assiduously as required for potential benefits to be realised (Klein & Sorra, 1996). This occurs despite the initial expectations of the potential impact of the innovation when it was adopted at the start of the project.

To check if an implementation was successful, the organisation can investigate implementation effectiveness. The effectiveness of the implementation is described throughout the literature as the quality and consistency with which the targeted organisational members use the innovation (Klein & Sorra, 1996). Nilsen & Birken (2020) highlight that many believe that research on implementation can help bridge the gap between evidence and practice. Which is why it is important to turn towards the scientific field regarding implementation, as it describes "how to facilitate and combine research findings and evidence-based practices into day-to-day operations in order to improve the quality and effectiveness of the implementation" (Nilsen & Birken, 2020).

In conclusion, my observations highlighted the struggle organisations face while implementing innovations. Despite proven effectiveness of certain innovations, integration into daily operations remains a challenge. This underscores broader issues in implementation research and science, where despite available frameworks, organisations still fail in realising the innovation's potential. Success of implementation is achieved by employees' skill, consistency, and commitment in using innovations, emphasising the need to develop solutions based on evidence for practitioners. Moving forward, relying on evidence-based practices proves crucial for organisations aiming for effective innovation implementation.

1.2 Literature to overcome implementation failure: still relevant

Over the past few years, multiple research papers have highlighted the high failure rates, which range from 20-90%, for implementing (complex) innovations (Jacobs et al., 2015; Cândido & Santos, 2015; Decker et al., 2012). These failure rates indicate a clear problem with implementation practices. However, there is an even more pressing issue as there is still much to be discovered about how these implementation processes can be improved. Many of the papers in implementation science focus on single case studies, but a comprehensive view of innovation implementation is needed to identify patterns of issues that can influence implementation effectiveness. These individual issues can occur at various stages within a project and may be difficult to monitor throughout the project. It is challenging to fully comprehend the impact of different issues simultaneously when only researching a specific case study.

According to Aarons et al. (2010), implementing innovations can be a complex and multi-level endeavour. The implementation of an innovation already impacts multiple levels within an organisation, making it difficult to address issues that occur outside the project scope but still influence implementation. Fixen et al. (2009) explains that implementation involves various stages that don't follow a straightforward path but instead rely on complex relationships between them. While implementation research has focused on individual stages, it lacks rigour in understanding how these stages and levels within the organisation intersect.

For example, Klein & Sorra (1996) state that numerous studies have already been conducted across organisations to determine the factors that influence innovation adoption (e.g. Damanpour, 1991; Tornatzky & Klein, 1982). However, Aarons et al. (2010) discuss several frameworks that lead them to conclude that the current literature on implementation primarily focuses on the implementation phase of the process, with less attention given to the exploration/adoption phases. Nonetheless, both papers, as well as Fixen et al. (2009), emphasize that different implementation steps compensate for and complement each other. Weaknesses in one step can be overcome by strengths in another step. These differing perspectives in the literature highlight the lack of coherence between studies. Each study has its own interpretation of the complete implementation process, making it difficult to reach a conclusion that can help the practical field of implementation in reducing implementation failure.

The field of implementation science focuses on practical literature that emphasiSes evidence-based practice. It was introduced by Sackett et al. (1996), who defined it as the "thoughtful, clear, and careful utilisation of the most up-to-date evidence to guide decisions regarding practice." While there are many models, theories, and frameworks described in Nilsen & Birken (2020) that outline general implementation processes, these models often do not adequately address the challenges and dynamic nature of the implementation process. They do not provide clear guidance on how to navigate these complexities. As a result, there are high rates of implementation failure.

In conclusion, research indicates significant challenges in implementing complex innovations, with failure rates ranging from 20-90%. Despite this, there's a lack of comprehensive understanding about why these failures occur. Many studies focus on individual cases, overlooking broader patterns that affect implementation effectiveness. Additionally, the multi-level nature of implementation makes it difficult to address issues beyond project boundaries. Existing literature lacks coherence in understanding the entire implementation process, and practical guidance often falls short in addressing implementation dynamics. Implementation research should therefore aim to bridge these gaps and offer practical solutions for guiding implementation complexities effectively.

1.3 Current view on the process of implementation

The literature in the field of implementation science has already put rigorous effort in identifying the process of implementation and individual factors that can influence its effectiveness. It is essential to highlight this literature because it provides a general overview of implementation practices and a coherent perspective on how implementation is actually carried out.

1.3.1 The process of implementation

In the broader process of introducing something new into an organisation, implementation stands out as a crucial stage. Following the classic model by Rogers et al. (2003), this process involves five key phases: Dissemination, Adoption, Implementation, Evaluation, and Institutionalisation. These are described in figure 1.1.

The first step in implementing an innovation is Dissemination, which involves two stages: Knowledge and Persuasion. First, Knowledge occurs when an individual is exposed to the innovation's existence and gains some understanding of how it works. Persuasion occurs when an individual forms a favourable or unfavourable attitude towards the innovation. If the Persuasion phase results in a favourable attitude, the individual needs to spread awareness about the new idea among potential stakeholders. These stakeholders can be divided in three different groups; the decision-making unit, the targeted organisational members, and the implementation team. The decision-making unit consists of the individuals who make decisions regarding the project within the organisation (Rogers et al., 2003). These individuals are often within higher levels of the organisation (eg. managers, CEO etc.) (Klein & Knight, 2005). Targeted organisational members (or targeted users) are defined by Klein & Sorra (1996) as "individuals who are expected either to use the innovation directly (e.g., production workers) or to support the innovation's use (e.g., information technology specialists, production supervisors)". Lastly the implementation team, which consists of individuals (or other decision-making unit) that puts the innovation into use (Rogers et al., 2003).

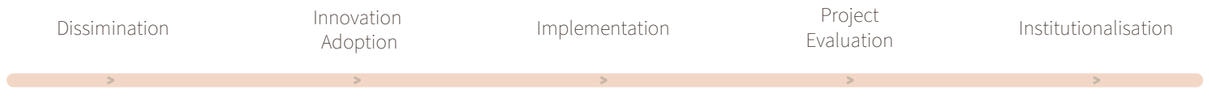


Figure 1.1: The process of implementation according to Rogers et al. 2003

Secondly, Adoption occurs when a person, group, or organisation, often consisting of the decision-making unit, makes a deliberate decision to embrace the innovation. The innovation can be internally developed or acquired from outside the organisation. During this phase, the individuals evaluate different innovations to eventually make a decision to adopt or reject the options.

The next stage, Implementation, involves effectively putting the new idea into practice. This stage requires a change in behaviour from targeted organisational members as they actually start implementing the new idea. The implementation team utilises policies and practices to ensure the successful execution of the idea.

Then, Evaluation takes place, where the effectiveness of the innovation in achieving its intended goals is assessed. During this phase, various stakeholders evaluate different variables related to the effectiveness of implementation, such as consistency and quality in the use of the innovation (Klein et al., 2001). Additionally, it is recommended to evaluate the implementation process itself in order to improve future implementation efforts. Finally, Institutionalisation happens when the innovation becomes a regular part of how the unit or organisation does things, taking its position in the existing organisational operations. This phase has multiple definitions throughout the literature, for example routine use by Klein & Sorra (1996). Eventually, the new idea becomes a normal and regular part of day-to-day activities of how the organisation does things.

1.4 Challenge of this project

This thesis aims to offer a solution for implementation practice, with the goal of increasing implementation effectiveness and reducing the likelihood of implementation failure. Based on insights from existing literature, there is an extensive amount of information about implementation failure, but not how this information can help organisations improve their practices. By identifying common patterns and issues that hinder implementation effectiveness, and recognizing the multi-level and dynamic nature of implementation, practitioners can be supported in improving their execution of implementation. By bridging the gap between evidence-based literature and practical application, this thesis provides practical insights and guidance for executing and navigating the complexities of implementation processes for practitioners. It does so by using design science to guide the analysis of implementation practices to come up with artefacts that help organisations implement more effectively.

"How can we support organisations to increase their innovation implementation effectiveness?"

1.5 Scoping this project

Figure 1.2: The implementation process including the scope of this project at the target company (Company A)

As the implementation process consists of five phases, each with different stakeholders, tasks, and issues, this study specifically focuses on the "implementation phase" described by Rogers et al. (2003), which is depicted in figure 1.1. To narrow the scope of interest, this research only examines organisations that implement innovations developed outside the target company. This focus is considered, as innovation implementation within larger organisations has been observed to be difficult, especially when the organisation does not have the expertise to execute such a project inhouse.

This focus implies that during the innovation selection phase, various options are evaluated, and the company chooses the most suitable innovation that meets its needs. This chosen innovation can be an external product, service, program, technology, etc., acquired from an external party. From this point forward, the company that acquires the innovation is referred to as the target company or 'Company A'. Figure 1.2 illustrates the scope of this project in the implementation process as described by Rogers et al. (2003).

As the innovation is required from outside the organisation, there are other stakeholders who influence this system, for example the innovation owner or external implementation specialists. A schematic illustration of this system can be found in figure 1.3. The external party that developed and/or owns the innovation are referred to as the innovation owner or 'Company B'. They have executed a separate process to develop an innovation.

Furthermore, a growing trend is that the implementation practices are not to be executed by employees of either Company A or Company B, but rather by an external party specialising in implementation. This external party is referred to as 'Company C' or a third party. This third party can be hired for the project in two ways: a) hired by the target company, or b) hired by the owner of the innovation.
In the first scenario, the third party possesses knowledge of the implementation process and the target organisation, but lacks experience with the innovation. The second scenario describes the relationship between the third party and the owner of the innovation, indicating that the third party has a close connection to the innovation, but less so to the target organisation. By providing organisations that execute implementation from the Company C perspective with the findings from this thesis, we can reach more organisations, as they execute implementation projects on a regular basis.

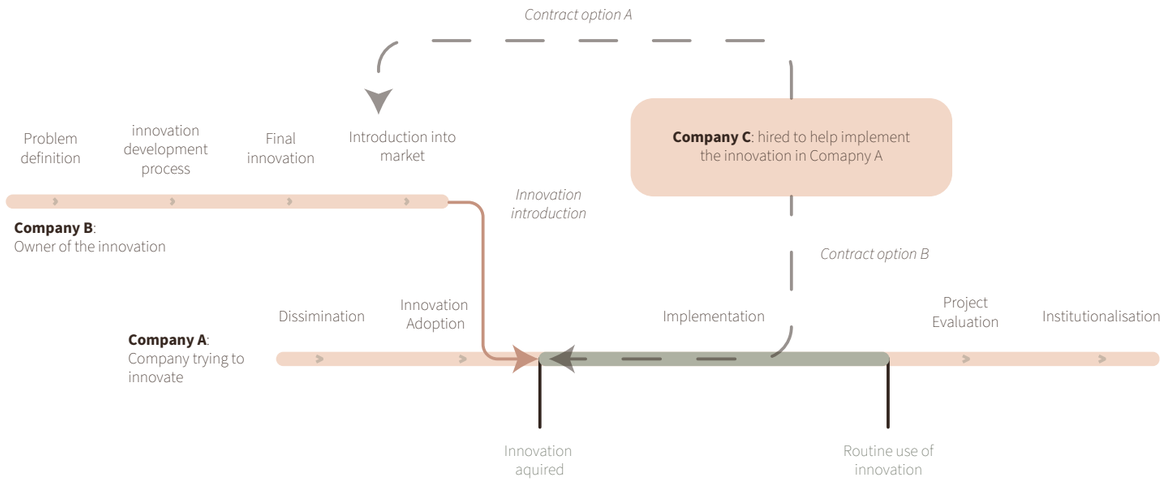


Figure 1.3: A schematic example of an innovation process within a target company and the interaction with the external organisations

1.6 Concluding chapter 1

- High failure rates (20-90%) indicate significant challenges in implementing complex innovations.
- Current research primarily focuses on individual case studies, overlooking broader patterns affecting implementation effectiveness.
- The multi-level nature of implementation makes it difficult to address issues beyond project boundaries.
- Existing literature lacks coherence in understanding the entire implementation process.
- Practical guidance often falls short in addressing the dynamic nature of implementation.
- The thesis aims to provide a solution for the field or implementation practice. It does so by identifying common patterns and issues, recognizing the multi-level and dynamic nature of implementation, and bridging the gap between evidence-based literature and practical application.

Project approach

02

2.1 Project approach: using Design Science Research to solve the problem

The research on implementation resembles piecing together a puzzle, where we gather insights, models, and frameworks as separate puzzle pieces. However, these pieces alone do not complete the puzzle. To enhance evidence-based practice and improve implementation effectiveness, it is important to understand the perspectives of practitioners (e.g., the implementation team) and find a solution that aligns with their needs. In other words, it is not only the content that matters, but also the shape of how they can implement effectively.

To achieve this, this thesis uses the Design Science research approach (figure 2.1). This approach by Simon (1996) originates from problem-solving research and aims to generate artefacts for effective and efficient innovation implementation. It focuses on real world problems by creating artefacts to guide end-users so they can use the knowledge generated by science. According to Hevner et al. (2004) "The artefact is a result of experiences, creativity, intuition, and problem solving capabilities of the researcher" and is used as an innovative solution for practitioners to increase their innovation implementation effectiveness.

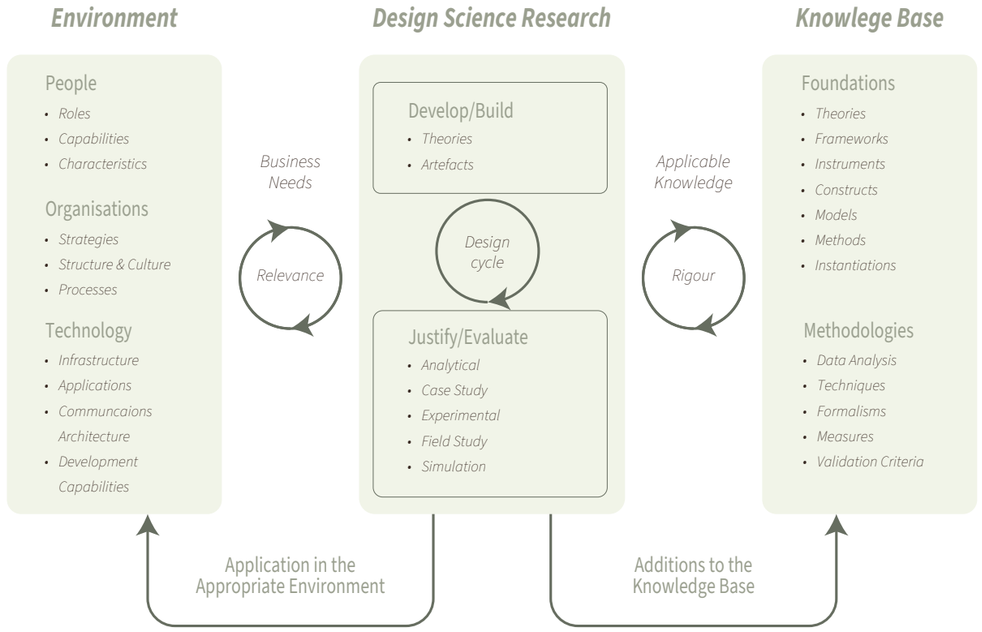


Figure 2.1: Design Science Research approach by Simon (1996)

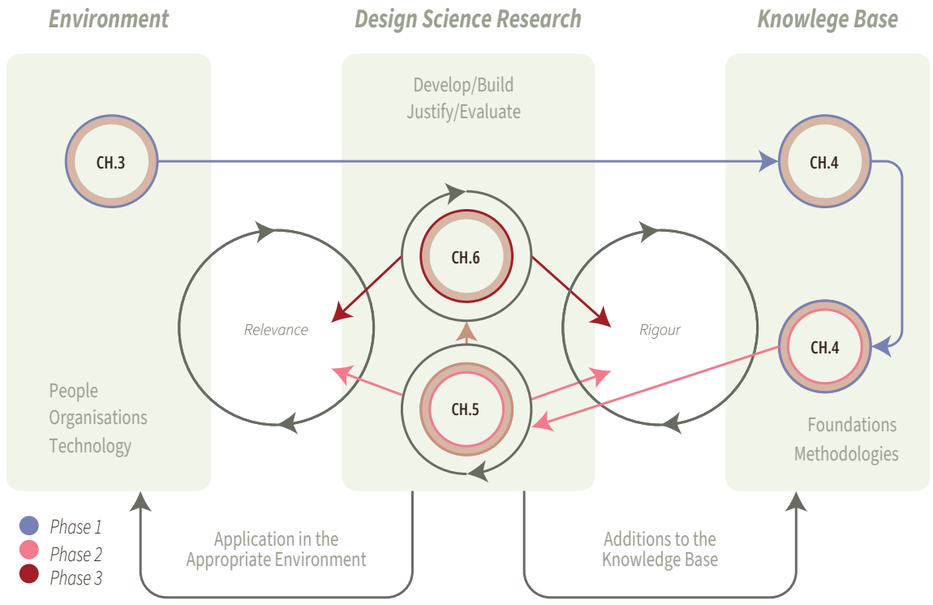


Figure 2.2: The project approach within the Design Science Research approach

To increase the effectiveness of implementation and develop artefacts that fit the practitioners, three phases have been identified (figure 2.2). The first phase (purple) involves gathering all the individual puzzle pieces. This phase aims to gain a clear understanding of the implementation process and the issues that can lead to implementation failure. Patterns are identified, and methodologies are provided to deepen the understanding of implementation practices. The analysis from this phase leads to the second phase (pink): the development of an artefact that helps practitioners improve their implementation practice by adding the final piece to the puzzle.

This final piece is an addition to the existing framework for Quality Implementation and a conclusion from the analysis executed in phase one. Finally, the third phase (red) develops an artefact to find the final shape of the puzzle. We combine all the insights into an artefact practitioners can use to increase implementation effectiveness.

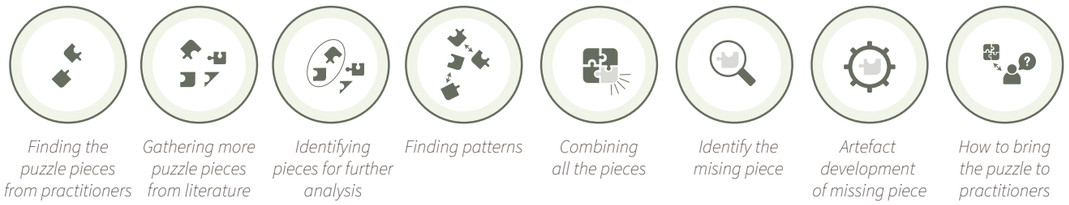


Figure 2.3: Completing the puzzle of effective innovation implementaiton

2.2 Phase 1: analysis of the problem of implementation failure

To fully understand why implementation can fail, the first part of this thesis consists of two steps. These steps are displayed in figure 2.3. First, to find all the different pieces of the puzzle to increase implementation effectiveness, a clear understanding about the environment must be made. Within this environment, people, organisations, and the innovation all play crucial roles. To comprehend the process of innovation implementation and the various influences that can result in implementation failure, it analyses implementation practices using qualitative data. This is further explained in paragraph 2.2.1.

The second step in discovering the reasons for implementation failure involves analysing existing literature, explained in paragraph 2.2.2. This gives us more puzzle pieces and enhances the qualitative data with research from the knowledge base.

To continue, the second phase focuses on the development of an artefact as understanding design science involves recognising an important idea: design involves both doing (research as a process) and creating something (as a result).

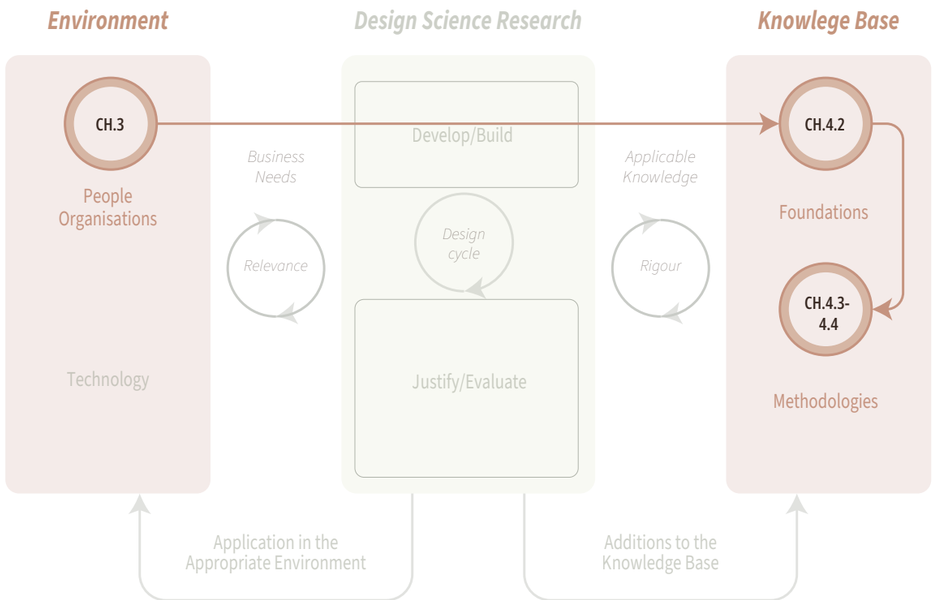
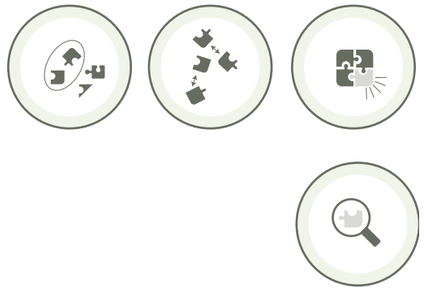


Figure 2.3: The second phase of Design Science Research approach: creation of an artefact that builds on findings in the Knowledge Base



2.2.1 What problems do practitioners identify that decrease implementation effectiveness

During implementation, a team of devoted employees is appointed to guide the process of implementation. To fully understand the challenges faced during this process, it is essential to directly engage with these practitioners. They experience issues firsthand and are the employees responsible for overcoming the challenges that arise.

The first step in finding the puzzle pieces for effective implementation, is to conduct qualitative interviews with practitioners. By selecting grounded theory as a methodological framework, this analysis focuses on the roles, capabilities, and characteristics of implementation. Most importantly, it addresses the problems that practitioners face when attempting to implement an innovation. The details of the study's participant selection, justification, and methodology are further explored in Chapter 3. The goal of qualitative research is to gather insights that support the creation and use of solutions for unresolved business problems.

2.2.2 What insights does implementation science offer?

As a second step in understanding how to improve implementation effectiveness, we conduct an analysis of existing literature. This analysis provides us with a rationale for the patterns identified during the qualitative analysis. These patterns reveal different perspectives from the literature regarding what to do in order to enhance implementation effectiveness and add more pieces to the puzzle.

Once we have analysed the environment and the knowledge base, it is important to integrate all the puzzle pieces. This makes way for discovering disconnects and a missing piece on why implementation still has a high failure rate. By providing a rationale for this missing piece, we can further improve an action-oriented framework identified in the analysis.

2.3 Phase 2 & 3: artefact development

As stated before, understanding Design Science Research requires acknowledging a doing (as a process) and creating something (as an outcome). This perspective involves perceiving design as both actions (similar to research processes) and results (similar to objects). This approach to design helps in problem-solving by alternating between considering how things are done and the end products for the same complex issue as visualised in figure 2.4. The design process involves a series of actions with the practitioners that lead to a new creation, referred to as the artefact. Evaluating this creation provides feedback and helps to understand the problem, thereby facilitating improvements in both the quality of the creation and the process itself. This cycle of creation and evaluation is often repeated multiple times before arriving at the final design. Throughout this creative journey, it is crucial to recognize how both the process and the creation evolve in response to the practitioners' requirements.

Phases two and three focus each on different processes for creating artefacts. Phase two primarily focuses on creating an artefact to address the missing piece of the puzzle: enhancing quality implementation. This phase utilises the integrated Creative Problem Solving approach by Heijne & van der Meer (2019). The Creative Problem Solving approach is based on the concept that various techniques for facilitating creativity can enhance adaptability and lead to innovative results. A well-facilitated creative process preserves original ideas and promotes further development. A more detailed description about this phase can be found in paragraph 2.3.1.

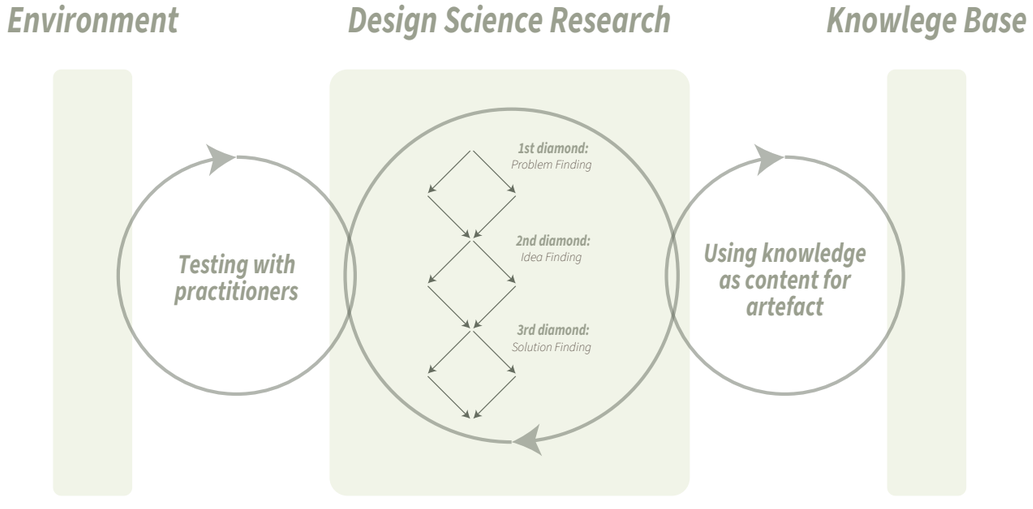


Figure 2.4: The integrated Creative Problem Solving approach to create an artefact that fits practitioners

Phase three reviews the findings from the previous phases and concentrates on creating an artefact that involves the entire puzzle. The physical shape of the puzzle is designed to support implementation practitioners in enhancing their practice. The creation of this artefact is described by suggesting various formats through which we can educate practitioners about the essential actions, steps including their reasoning required for more effective implementation. This chapter is further explained in paragraph 2.3.2.

2.3.1 Phase 2: artefact development to enhance quality implementation

Concluding from phase one, we have identified a missing component in literature that is crucial for effective implementation according to practice. Phase two focuses on a development phase in which co-creates with practitioners on how to improve their process so it addresses this component more prominently. The integrated Creative Problem Solving approach by Heijne & van der Meer (2019) helps guide this artefact development. This approach identifies three steps; Problem finding, idea finding, and solution finding. For this thesis we add a step that involves testing the artefact to validate its feasibility. Figure 2.5 highlights the different steps for executing the artefact creation in phase two.

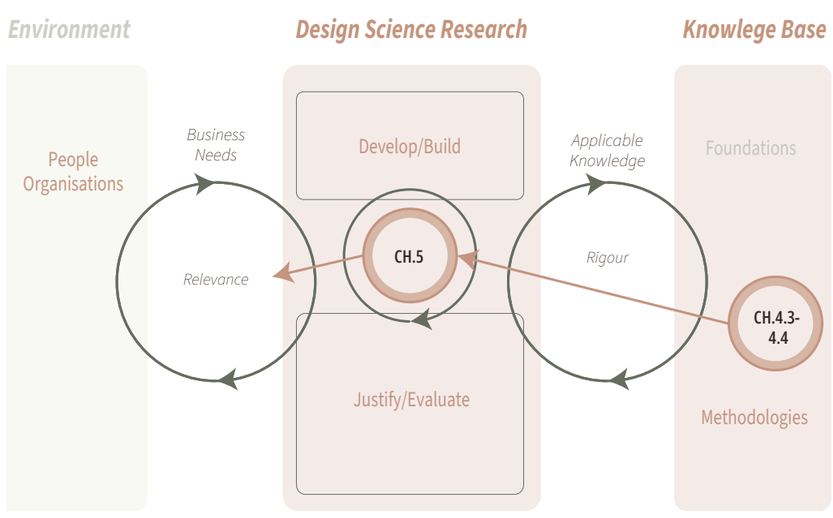


Figure 2.5: creating an artefact that is Rigorous and Relevant for practitioners

2.3.2 Phase 3: artefact development to improve implementation effectiveness

We have now developed a complete puzzle that outlines how implementation practitioners can effectively implement. However, it is important that this knowledge is shared with practitioners in a way that truly aids them in their work. This will be done by another artefactdevelopment as explained in figure 2.6. This requires the creation of a practical artefact that assists organisations in increasing their effectiveness in implementing innovation.

Detailing the development of this artefact includes suggesting different formats to educate practitioners about essential actions, steps, and their rationale, facilitating more efficient implementation. Also distribution of the artefact is discussed and how this can be put into the context of an organisation and the practitioners.

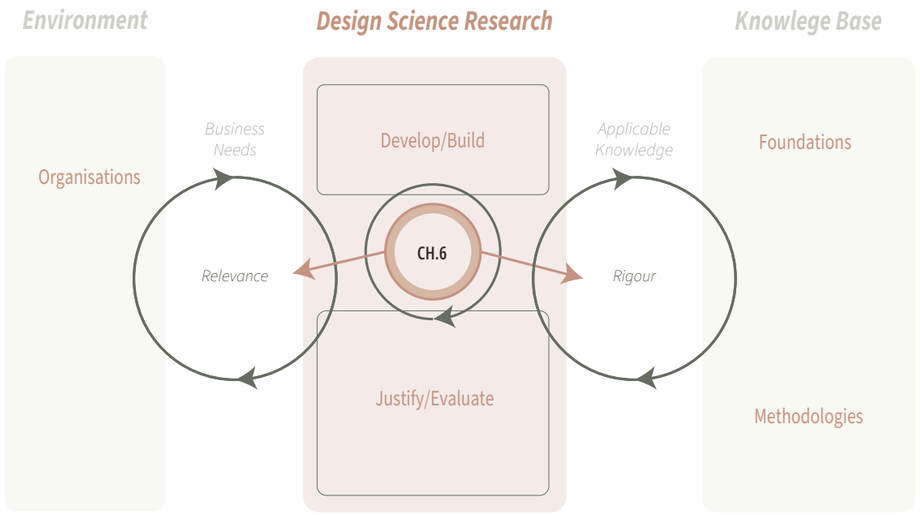


Figure 2.4: creating an artefact that is Rigorous and Relevant for practitioners

2.4 Research questions & outcomes

RQ: How can we support organisations to increase their innovation implementation effectiveness?

SQ1: *What is the process of implementation and what are the most important actions to improve implementation effectiveness?*

SQ1.1: *What do practitioners say about the process of implementation and issues that influence this process?*

SQ1.2: *How can we transform the process and issues from literature and practice into actions to achieve effective implementation?*

SQ2: *What does the field of implementation science suggest to practitioners on executing implementation?*

SQ2.1: *Can we identify patterns in the actions for effective implementation and how can these patterns improve the effectiveness of implementation?*

SQ2.2: *How does the literature propose approaching implementation effectively in practice?*

SQ2.3: *Why is this not working yet?*

SQ3: *Can we design a policy or practice that can help practitioners to improve implementation practices?*

SQ4: *Is it possible to create an artefact to educate practitioners to improve implementation effectiveness?*

In order to develop relevant artefacts that increase the effectiveness of innovation implementation, research questions are used to support the main research topics.

It provides a brief overview of the expected outcomes. By examining the practitioner perspective on implementation practices, it uncovers the primary factors that can lead to implementation failure. These factors are compared and combined with those identified in existing literature to determine the most important actions for practitioners to consider in order to achieve effective implementation. By identifying patterns within these actions, we can further explain their importance in effective implementation and establish methods for monitoring effectiveness. The analysis of both literature and practice contributes to existing research by creating a practical artefact that contributes to improving implementation effectiveness. All the insights gained from the previous analysis conclude in the development of an artefact that educates practitioners on improving implementation effectiveness.

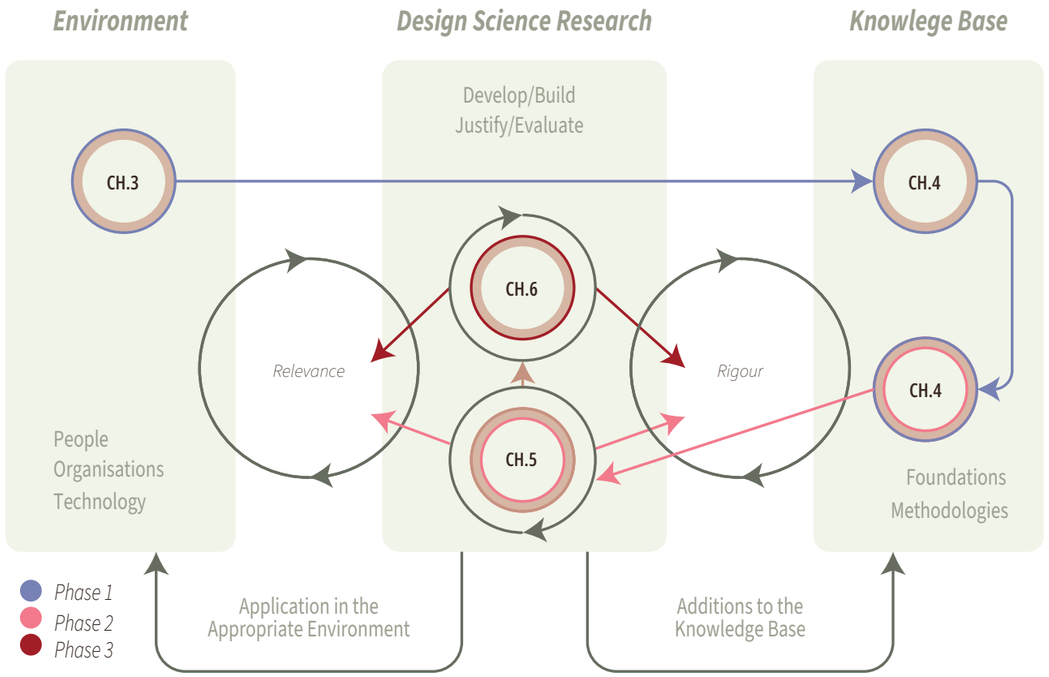


Figure 2.6 : The project approach within the Design Science Research approach

2.5 Concluding chapter 2

- The research likens understanding implementation to solving a puzzle, where insights, models, and frameworks act as separate puzzle pieces, emphasising the importance of understanding practitioners' perspectives and aligning solutions with their needs.
- By using the Design Science Research approach, the study aims to develop artefacts for effective innovation implementation by focusing on real-world problems and creating tools to guide end-users.
- The research progresses through three phases: gathering insights and understanding the implementation process by analysing the view of the practitioner and combining the insights with current literature, developing artefacts to address identified issues, and creating a comprehensive tool to support and educate practitioners in how to implementate effectively.
- Phase one involves qualitative analysis of practitioner perspectives and literature review to identify key factors influencing implementation failure, aiming to enhance understanding of implementation practices.
- Phase two focuses on co-creating artefacts with practitioners to address an identified gap, utilising the Integrated Creative Problem Solving approach to guide development and validation
- Phase three emphasises designing a comprehensive artefact to facilitate more efficient implementation, considering various formats for practitioner education and distribution within organisations.

Qualitative research: identification of the process of implementation and its 13 key actions

03

3.1 Introduction to qualitative research

To analyse what influences an implementation project and find the first pieces of the puzzle towards effective implementations, it is important to gain insights from practitioners. This chapter focuses on the process of implementation according to practitioners and the issues that they encounter during their work. This is why chapter 3 contributes to SQ1: "What is the process of implementation and what are the most important actions to improve implementation effectiveness?". It starts by introducing the general process of implementation according to the literature and scope of this project. It continues to analyse the findings from a qualitative study that focuses on gaining insights in the practitioner's view on the process of implementation and actions that influence the implementation process. This answers SQ1.1. "What do practitioners say about the process of implementation and issues that influence this process?". The final goal of chapter 3 is to combine the insights from qualitative and literature research into thirteen actions for practitioners that are crucial to effective implementation which answers SQ1.2. "How can we transform the process and issues from literature and practice into actions to achieve effective implementation?"

The qualitative study involves interviewing five project leads who are responsible for implementing innovation within organisations. It focuses on their experiences with implementing practices in both current and past projects. Subsequently, the following chapter explores the dataset, providing details on data collection and processing, before presenting and concluding the findings.

3.2 Qualitative method

Section 1.3 explains the different stages an organisation goes through during an implementation process. However, to gain a better understanding of the issues that arise in this system, a qualitative approach was selected to answer SQ1.1 "What do practitioners say about the process of implementation and issues that influence this process?" When preparing the research design, careful thought was given to the importance of obtaining diverse perspectives on innovation implementation within companies. Pratt (2009) suggests that qualitative research is ideal for exploring "how" questions rather than "how many," offering valuable insights into individuals' perspectives. Additionally, Creswell et al. (2007) highlight that qualitative research enables understanding the context surrounding a phenomenon. This aims to understand the context of how project leads carry out an implementation process and identify and address issues that arise.

3.2.2 Participant selection

For this research, three project lead perspectives within the system are chosen. The first perspective is from an internal employee from the organisation trying to implement the innovation, who is familiar with their organisation's dynamics but less so with the innovation. The second perspective is from an external employee contracted by Company C and hired by Company A, specifically for their past project experience. However, they need to acquaint themselves with both the company and the innovation. The third perspective is also from an external employee, but in this case, they are hired by Company B. They are familiar with the innovation but not the company where it is implemented (Company A). Participants are selected using convenience sampling, ensuring variation in participants, projects, and companies. Perspective and innovation acquisition are considered for coherence within the participant sample (Figure 3.1).

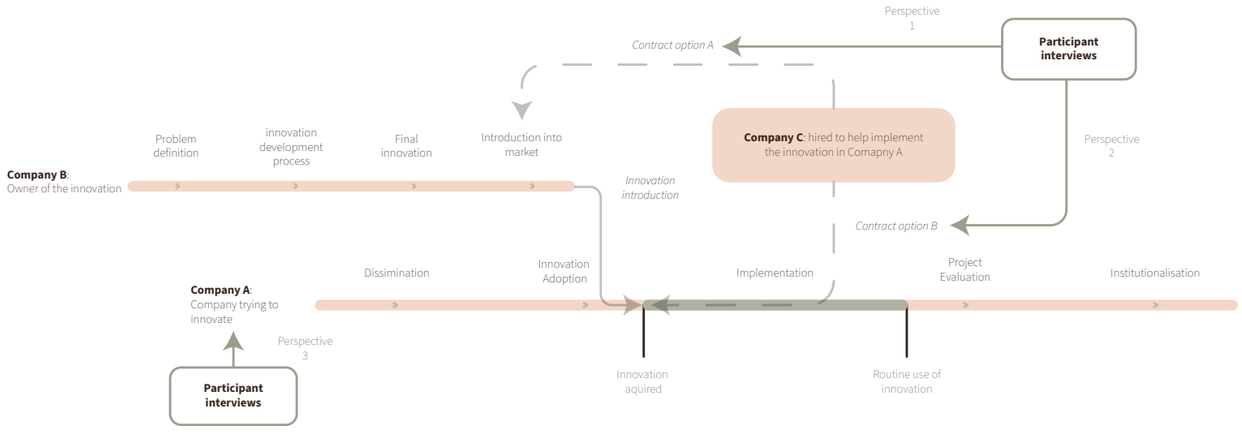


Figure 3.1 : Participants perspective in regards to the target company

Participant 0 (pilot)

Participant 0 for this research works as a product designer within the organisation. Throughout the project, he did take on tasks that are typically performed by the project lead. As a result, he is considered a suitable candidate for this study. The participant works for a company in the advice and engineering sector in the Netherlands. The innovation discussed during the interview was a client portal that was partially developed prior to the project and partially developed by the project team the participant was part of. The extent of product development during the project had a significant impact on both the project scope and the utilisation of the innovation. Both clients and employees of the organisation were targeted as key members for implementing this innovation.

Participant 1

Participant 1 was selected due to his extensive knowledge about the implementation of innovations within the healthcare sector. He has been working in this area for over 15 years and has therefore lengthy knowledge on the subject. The participant works for an organisation specialised in the implementation of the electronic health records and acts as a third-party between the target company (health organisation) and organisation that owns the innovation. The implementation project discussed was recently finished, but optimization projects are continuing as the implementation was only partly successful.

Participant 2

Participant 2 has been selected due to the fact that this project is finished and the innovation is in routine use. The company is now expanding the innovation to different applications and the participant is involved in these implementation projects as well. The participant works for the target company and joined the implementation team half a year after the initial project has started. The company of this participant acts in the advice & engineering industry and uses this innovation, the innovation funnel, to develop innovative solutions for their clients.

Participant

As an employee of a third-party company, participant 3 brings a different perspective to this study. He works for a consultancy company that helps companies in different sectors implement innovations. The project of topic has just started the implementation process within the target organisation. The project is part of a bigger strategy of the company called 'The Energy transition' which includes six projects. The projects are all done simultaneously but by different project teams. The innovation of this project helps the targeted organisational members to better manage the network congestion and the innovation to solve this problem has been completely developed before implementation.

Participant 4

The last participant has been selected due to the nature of the innovation. The innovation is the introduction of a sustainable fleet (cars) as replacement of the old fleed. The innovation itself has great impact for the targeted organisational members and the work process, but less for the organisation itself apart from strategic organisational goals. The participant has been involved in the process of innovation feature selection, but not been involved in the decision of adopting the innovation. The project has been taking place for over 3 years and is almost at the stage of routine use. The participant is still on the project as he foresees capacity difficulties in the near future for which he thinks intensive assistance is needed from someone with experience within this project.

Table 3.1: Participant sample for qualitative data retrieval

# of participants	Function	Sector of project	Innovation	Phases project	Participants view (figure 3.1)
Pilot	Product developer	Advice & engineering	Client portal	Implementation	PV 3
Interview 1	Project lead	Health care	Electronic Health Record	Product in routine use	PV 1
Interview 2	Project lead	Advice & engineering	Innovation funnel	Product in routine use	PV3
Interview 3	Project lead	(Energy) Network company	Sensor-aid for network congestion	Implementation	PV 2
Interview 4	Project lead	Mail company	Sustainability of the (car) fleet	Implementation	PV3

3.2.3 Data collection and preparing for analysis

The data for this research was collected through semi-structured interviews with four project leads. These individuals are responsible for ensuring the successful outcome of the project, maintaining regular contact with stakeholders, and offering an interesting perspective for this qualitative study. Convenience sampling was used to select relevant participants. The initial participant served as a pilot and their data was utilised as a reference and to test the interview guide. The interview guide, based on a general outline of key topics to be explored with each respondent, can be found in Appendix B.1.

To maintain focus during the interviews, participants are asked to choose a specific innovation as the topic, and the conversation follows informally from there. Three of the five interviews are conducted in person, while the other two are conducted using Microsoft Teams. The interviews are recorded on a phone and transcribed using the "Auto-transcribing from audio" tool in OneDrive. The interviews lasted between 60 and 78 minutes and are conducted in Dutch. The transcriptions are organised and uploaded to Atlas.ti for evaluation. The transcripts have been anonymized and saved in a separate folder. They are deleted once this thesis is completed in order to minimise potential risks to the participants and organisations, in accordance with the consent forms allowing the use of the data for this thesis.

3.2.4 Analysis of the data

To conduct this research, the 'Grounded theory approach' (Glaser & Strauss, 1967)was chosen as the data analysis method. This approach focuses on identifying recurring patterns or themes in order to develop theory. More specifically, the Gioia method is used (Goia et al. 2013), which derives theory from lived experiences and actions through first-, second-, and third-order coding (Locke et al., 2020). The Gioia method builds upon the grounded theory method. According to Locke et al. (2020), coding involves "symbolically assigning a summative, salient, essence-capturing, and/or evocative attribute to a portion of data that applies to other portions or segments as well". In each section, relevant quotes are included from the interviews to support our data analysis. It is important to note that these quotes have been translated and edited for clarity in this thesis.

3.3 Findings from the interviews

As we have identified the process of implementation from literature, it is important to check the findings with reality. With our data we have executed two analyses that contribute to this study. The first analysis focuses on different components of the process of implementation and will be discussed in section 3.3.1. The second analysis focuses on issues that arise during the process of implementation according to practitioners. To contribute to these findings, the scientific perspective is analysed in section 3.3.3.

3.3.1 Components of an implementation process

As discussed in section 1.3.1, literature has generally described the process of implementation. During data retrieval with practitioners, this process is elaborated on. The rationale including the citations from the participants can be found in Appendix B.2. Table 3.2 elaborates on several categories that were found during the process of coding, with each category highlighting specific components of the process of implementation. The findings are subdivided into three categories: implementation tasks, stakeholders, and case specific knowledge.

Table 3.2: The different types of codes used to analyse interviews.

1. Implementation tasks	2. Stakeholders	3. Case specific knowledge
1.1 Implementation plan/process	2.1 The organisation's decision-making unit	3.1 Unfamiliarity with either the innovation or organisation
1.2 Development of the innovation to fit the organisation	2.2. Targeted organisational members	3.2 Experience from previous projects
1.3 Handover	2.3 Project team	
	2.4 Support team	

3.3.2 Issues during an implementation process

In the previous section, we used the Gioia method (Gioia et al., 2013) to construct our theoretical model. We identified the implementation process and stakeholders, as well as their tasks. By revisiting the data using the same method, we are able to identify the most important issues and project components. The first order codes remain the same as those used in the previous analysis. The second order codes are identified based on the frequency of mention or the length of the corresponding conversations. As a result, we highlighted 24 codes that represent issues during the implementation process or within the organisation. To identify the aggregated dimensions, we examined patterns and identified eight issues that impact the implementation process and its effectiveness. The aggregated data including the rationale of these findings can be found in Appendix B.3. The following issues were identified during the analysis:

1. Non-user-centred (targeted members) approach while selecting the innovation during innovation adoption
2. Non-user-centred (targeted members) development of features and processes during testing and implementation phase
3. Handover to the business-unit or new project members often fails
4. The decision-making unit fails to prioritise the correct use of the innovation by targeted organisational members as it is not a part of their personal evaluation (eg. KPIs)
5. Unclear and uninvolved product and process support
6. The implementation of multiple parallel innovations (either with the same goal or different goals) can cause difficulties due to opposing/competing sub-goals
7. Unexpected changes with a major impact
8. In projects, non-innovation-related requirements demand the implementation team's attention due to a low quality planning and unclear project requirements

3.3.3 Identified tasks and issues according to literature

To understand the status quo of current literature, it is important to identify some important findings in literature. During implementation, an organisation has different policies and practises in place to support the transition from the old situation to the new (Klein et al., 2001). A policy is a plan or course of action intended to influence and determine decisions and actions (Nilsen & Birken, 2020), whereas we identify practices as different tasks executed by the project team. Implementation policies and practices contain various innovation-related organisational and managerial policies, practices and characteristics that can impact the adoption and use of innovation (Klein et al., 2001). From this we can conclude that the policies and practices in place must be executed and this must be done correctly in order to achieve effective implementation.

Klein et al. (2001) describes six policies and practices that may influence an organisation's effort of effective implementation. The policies and practices that they identified most in case studies are:

A. The quality and quantity of an organisation's efforts to train organisational members to use the new technology
B. User support - the provision of technical assistance to technology users on an as-needed basis
C. Rewards, such as promotions, praise from supervisors, or improved working conditions, for technology use
D. Effective communication regarding the reasons for the implementation of the new technology.
E. The provision of time for users to experiment with the new technology
F. The quality, accessibility, and user-friendliness of the new technology itself

Klein and Sorra (1996) suggested that the impact of implementation policies and practices can be accumulated over time, can compensate for other issues, and ultimately lead to similar outcomes once used more during multiple projects. Therefore, having high-quality implementation policies and practices in some areas may minimise issues or lower quality in others.

Klein, K. J., & Knight, A. P. (2005) argue six reasons for the failure of implementation. Despite this knowledge being published in 2005, companies still struggle with effectively implementing innovations, and these topics are not rigorously addressed. The project team needs to continuously monitor these six reasons in order to foster effective implementation. The six reasons are as follows:

A. Innovations, especially technological innovations, are often unreliable and imperfectly designed, leading to frustration among users and hindering correct use
B. Many innovations require users to acquire new technical knowledge and skills, which can be stressful
C. Decisions to adopt innovations are typically made by higher-level management, leading to resistance and scepticism from targeted users who may be instructed to use the innovation against their preferences
D. Manny innovations require individuals to change their roles, routines, and norms, disrupting established patterns and hierarchies
E. Implementation is time-consuming, expensive, and initially detrimental to performance, requiring significant investments in technology start-up, training, and support
F. Organisational norms and routines act as a stabilising force, which can lead to resistance to change even when the benefits of innovation are recognized

To conclude, even though Klein and Sorra (1996) and Klein, K. J., & Knight, A. P. (2005) presented these insights a long time ago, we want to emphasise the significance of their findings. Countless implementation efforts have been unsuccessful over the years, despite this information already being available.

3.4 Discussion of the findings

All the components and issues are individual puzzle pieces that explain the implementation process and what organisations need to improve for effective implementation. We answer SQ1.1, “What do practitioners say about the implementation process and issues that influence it?” This research question is further described in this section as we combine all findings into a model that explains the practitioners’ perspective on executing an implementation process. Section 3.4.1 elaborates on the formation of this model and its components.

We continue this section by combining the findings from our qualitative analysis with the literature that explains the recommended policies and practices for effective implementation, as well as the issues that can influence the process. From this analysis, we identified thirteen actions that can support organisations in implementing effectively. These actions are further explained in section 3.4.2.

3.4.1 A model of the implementation process including insights from practitioners

In section 3.2.1, we discussed the implementation process based on Rogers et al.’s (2003) study which contains the important stakeholders, the steps involved in the implementation process, and the relationships between them. Now that we have identified the process from the perspective of practitioners, we need to expand our model to align with reality. A model is drafted that shows the implementation process with all components identified during the qualitative data analysis. This model is visualised in figure 3.2 on the next page.

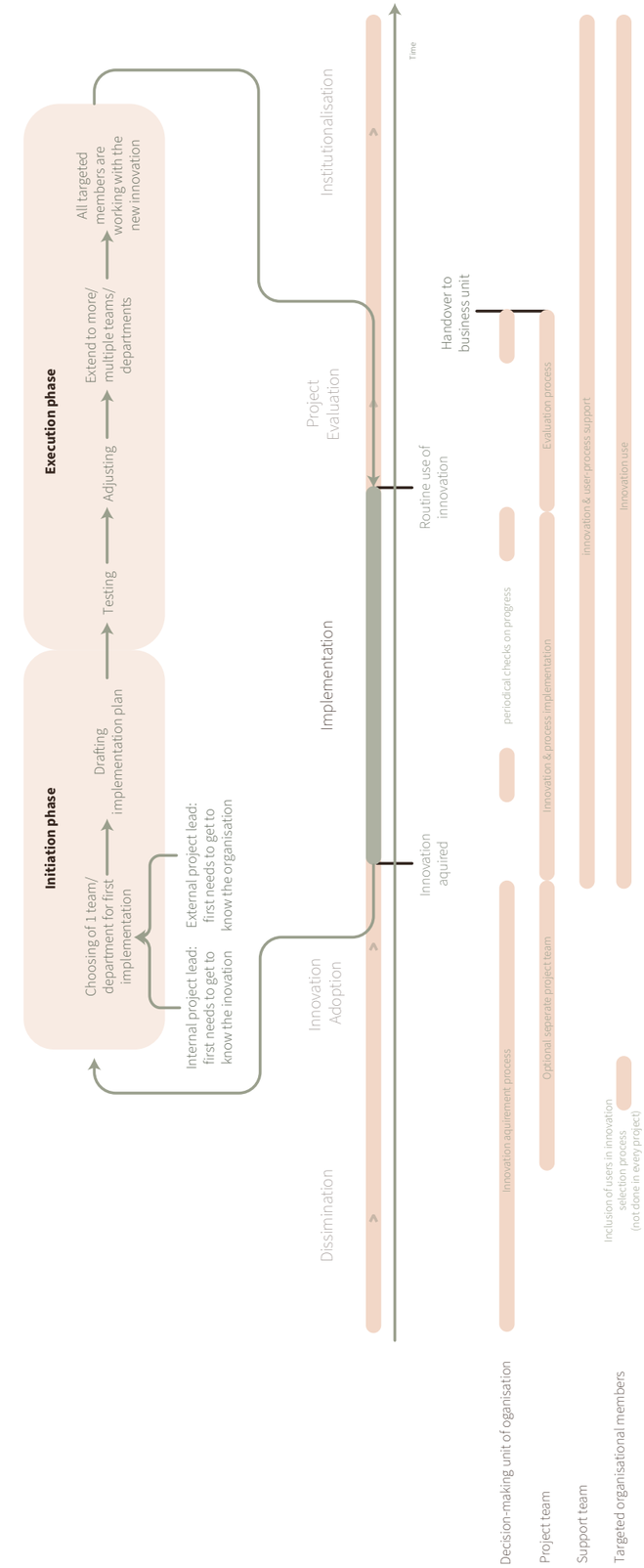


Figure 3.2: Schematic and simplified model of the implementation process adjusted from Rogers et al. (2003)

3.4.2 Actions that influence implementation

In section 3.3.3, we discussed six reasons why implementation is challenging, as identified by Klein & Knight (2005). Additionally, Klein et al. (2001) proposed six policies and practices that can influence implementation effectiveness. Now, in light of SQ1.2, we translate these insights into practical steps to assist organisations in achieving effective implementation. We accomplish this by identifying patterns in the literature findings and merging them with the conclusions of our qualitative analysis. The rationale for these patterns can be found in Appendix B.4. These findings identify the different patterns among the puzzle pieces in our analysis. The connections are made by combining similar insights into a single action. After assembling all the puzzle pieces, we have identified thirteen actions that can effectively support organisations in their implementation. The following subsections explain each of these thirteen actions.

1. During innovation adoption, select innovations by prioritising organisational members' needs over other considerations
2. Prioritise the development of features and processes based on the needs of targeted members
3. Ensure successful handover to the business unit or new project members
4. Prioritise the correct use of the innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs).
5. Provide clear and involved innovation and process support
6. Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals
7. Quickly address unexpected changes to minimise impact.
8. Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects
9. Enhance the quality, accessibility, and user-friendliness of the innovation.
10. Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation
11. Allocate time for users to experiment with the innovation
12. Ensure effective communication regarding the reasons for implementing the innovation
13. Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions

3.4.1.1 During innovation adoption, select innovations by prioritising organisational members' needs over other considerations

Section 2.4.2 describes the importance of involvement of the targeted organisational members during the entire implementation process. The innovation must align with users' processes and personal preferences, as well as align with the overarching goals established by higher levels in the organisation. It is important for the project team to develop the innovation user-centred and make decisions on where to personalise and where to standardise. The team can do a need analysis for the user to identify both needs and wishes. When this is done in early stages (before adoption) the best fitting innovation can be selected which increases implementation effectiveness.

3.4.1.2 Prioritise the development of features and processes based on the needs of targeted members

Also during implementation it is needed for the team to account for needs and wishes of the targeted users. It is common for project teams to execute a pilot test with a small group of targeted users to identify these needs and wishes and quickly come up with solutions for problems that arise. After effective process development and satisfaction from the users, the test is extended to new targeted users within the organisation. It is key to take into account that these new users are not part of the pilot, and for them this innovation is new, as well as the process changes. This needs to be monitored by the project team and the innovation should be adjusted for them similarly to account for an innovation fit with the process of the new users.

3.4.1.3 Ensure successful handover to the business unit or new project members

Handover has been proven to be particularly difficult but also of the utmost importance. Once testing has been finished, the team needs to inform the business unit of decisions made during the process. As the business unit also has particular processes, as well as their view on the innovation, it is important to involve this team already in the early stages of the process. During the practice study, the participants highlighted that most projects have set deadlines, but the objectives can be adjusted according to the project progression. It is important for the team to timely start preparing for this handover by documenting decisions as well as the implementation plan. This documentation is then account for reference for future employees that take on continuation for the project.

3.4.1.4 Prioritise the correct use of the innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs).

Difficult decisions or issues with innovation adoption by individuals can account for many failed projects, according to several participants within the interviews. It can be helpful to have sponsors or responsible executives within your project to take on part of these difficulties. They can for example do so to explain the reasons why the implementation is important for users personal performance but also the importance for the growth of the organisation. By including KPIs or other ways to make them accountable, helps the project team to take responsibility when needed to convince targeted users or even other directors. Klein & Knight (2005) highlighted this by proving the positive relation between management support and implementation effectiveness.

3.4.1.5 Provide clear and involved innovation and process support

During the process of using a new innovation, targeted users can have different responses. For example when a new feature they need to use often doesn't work properly, or the process of their day to day activities needs to change to fit the innovation. By having a team of support staff, which focuses on assisting innovation use, process development and day to day issues, the implementation team can focus on a more holistic view of proper innovation use. It is essential that this group of support staff is involved in the beginning of the implementation process, as they need to learn about the innovation itself but also be responsible for the continuation of the innovation use once the process is over. Their presence after the project keeps consistency and clarity to targeted users on where to go with questions and difficulties.

3.4.1.6 Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

During the interviews, the participants pointed out that most innovations are part of a program which is part of strategic goals or other organisational goals. These programs often contain several projects/objectives which need to be accounted for and different teams can work on similar (sub-)goals or on opposing (sub-)goals. It is important for the project lead to track their own project, but also other projects to detect issues in an early stage. When this is not done properly, this can result in contradicting information for targeted users and result in ineffective use of the innovation.

3.4.1.7 Quickly address unexpected changes to minimise impact.

This action can be seen as one of the main issues for implementation failure. Once unexpected events happen, it is expected of the project lead & the team to find a fitting solution. This affects the project objectives and also the features & use of the innovation. As the events are unexpected, the team can not prepare and it can happen at any moment. Unexpected events are also one of the main reasons for delays as the planned activities for the team need to be adjusted or even a new plan needs to be formed.

3.4.1.8 Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects

Participant 1 stated that most implementation plans are not specific which results in an open brief for the implementation team on what is to be expected of them. This can for example occur because the higher levels of the organisation do not know what the innovation can do for them or there has not been a user-centred approach towards innovation adoption. It is important for the project team to get all relevant stakeholders to have the same interpretation of the objectives in order to execute them well and prevent issues further in the project.

3.4.1.9 Enhance the quality, accessibility, and user-friendliness of the innovation.

The innovation has been adopted by higher levels within the organisation, but they (often) not be the users. Also, the organisation that owns and sells the innovation try to make sales with their product. Therefore, they for example try to make the deal and promise new features or customisation which can result in unfitting features or development. It is important for the project team to understand the innovation, its possibilities and features early in the project to be able to guide expectations from the target company and members.

3.4.1.10 Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

As targeted members are expected to use the innovation, they need to adjust their current activities to fit the new innovation. Eg. they need to get to know how to use a new software or new hardware which takes time and effort. It is important for the project team to carefully prepare and execute training for these users to evoke correct and consistent use of the innovation.

3.4.1.11 Allocate time for users to experiment with the innovation

Once introduction, training and implementation has been finished it is important for the organisation to acknowledge that organisational members need time to get used to the innovation. They need to adjust their day to day work and get enough exposure to familiarise and adapt to this new innovation. It is important to take into account that different teams and individuals have different learning capabilities and need more or less time to get acquainted. Also, to be able to keep on developing the innovation even after routine use, having the opportunity to experiment and interact with the innovation is crucial.

3.4.1.12 Ensure effective communication regarding the reasons for implementing the innovation

As the decision to adopt an innovation is often made by higher levels within the organisation (Klein & Sorra, 1996), it is important to explain to lower levels why it is important that the innovation is acquired and consistent and correct use of the innovation is expected. This can minimise the possibility of objections or even rejections from targeted employees as they see added value to their personal activities as well as the growth of the organisation.

3.4.1.13 Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions

This action is part of the management support and financial resources that Klein & Conn (2001) pointed out to be of essence for effective implementation. It is important that a sufficient amount of resources are available to accommodate the transition from the old situation to the new, but also the proper exploitation of these resources. Klein & Knight (2005) stated that “effective innovation implementation requires high investments of time and money in technology start-up, training, user support, monitoring,
meetings, and evaluation. Thus, even the most beneficial innovation is likely to result in poorer team and/or organisational performance in the short run”. By supporting the transition and accommodating with the necessary resources, this period can be justified easier to all stakeholders.

3.5 Concluding chapter 3

- To conclude this chapter, we executed a qualitative research to discover the practitioners perspective on the process of implementation and the issues they identify during this process.
- By using the grounded theory method by Glaser & Strauss (1967) we were able to identify the different components from an implementation process. With these insights we enhanced the process model of innovation implementation by Rogers et al. (2003). The newly developed model can be found on page 43.
- Process components and issues highlighted by both practitioners and literature are combined into thirteen actions aimed at achieving effective implementation:

1 During innovation adoption, select innovations by prioritising organisational members' needs over other considerations

2 Prioritise the development of features and processes based on the needs of targeted members

3 Ensure successful handover to the business unit or new project members

4 Prioritise the correct use of the innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs)

5 Provide clear and involved innovation and process support

6 Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

7 Quickly address unexpected changes to minimise impact.

8 Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects

9 Enhance the quality, accessibility, and user-friendliness of the innovation.

10 Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

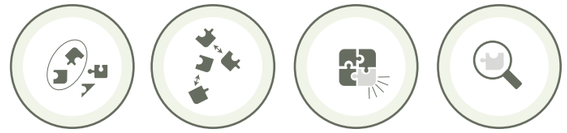
11 Allocate time for users to experiment with the innovation

12 Ensure effective communication regarding the reasons for implementing the innovation

13 Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions

Relevant literature in implementation science

04



4.1 Introduction to literature research

Within the field of implementation science, research has chosen many perspectives to describe implementation. As we are trying to find a solution to the RQ. “How can we support organisations to increase their innovation implementation effectiveness?”, we also want to gain a deeper understanding of the literature. This chapter focuses on answering SQ2. “What does the field of implementation science suggest to practitioners on executing implementation?”. This chapter is divided into three parts, each answering a different SQ and adding on to our puzzle to help organisations achieve effective implementation.

First, we turn our attention to section 4.2, which discusses relevant literature that builds upon the findings of chapter 3. Since we have identified several significant actions that aim to support practitioners in implementing more effectively, we can further investigate different patterns within these findings to address SQ2.1: “Can we identify patterns in the actions for effective implementation, and how can these patterns improve implementation effectiveness?” This section focuses on identifying patterns in the puzzle pieces that have been identified and uses complex theoretical constructs to explain these patterns. We conclude this section with explaining what practitioners can do with this knowledge.

We continue to prioritise practice-oriented literature where we explore a specific framework that provides practical guidance on executing an implementation process. Implementation models offer valuable insights into the implementation process and are specifically designed for practitioners to improve their implementation execution. In section 4.3, we analyse the Quality Implementation Framework to address the question: “How does the literature propose an effective approach to implementation in practice?” This framework is selected because it is in line with the previous findings of this thesis. These implementation models and frameworks contribute scientific contributions to practice that try to fill the evidence-practice gap.

Still, we have earlier identified that many implementation projects fail, which is why we continue this chapter by explaining in further detail SQ2.3 “Why doesn’t this framework work yet?” Within section 4.4 this missing piece of the puzzle is explained, as our analysis for effective implementation identified a gap in the Quality Implementation Framework that can lead to implementation failure.

In conclusion, this chapter is an exploration of implementation science into improving innovation implementation effectiveness for organisations. In this chapter we find patterns in our puzzle pieces to conclude with an assembled and comprehensive puzzle. Section 4.3 delves into identifying patterns within the actions from chapter 3, and explains these patterns with complex theoretical constructs. Moving forward, we prioritise practice-oriented literature, analysing the Quality Implementation Framework to provide an actionable approach for implementation execution. However, despite the fact that we still observe high rates of implementation failures in the field, we discuss the limitations of this framework in section 4.4. The goal of this chapter is to highlight the evidence-practice gap that is still present and give suggestions on how to decrease it.

4.2 Four complex theoretical constructs to explain patterns in the thirteen key actions

Things happen for a reason and people make decisions for a reason. Finding this underlying reason can help explain why an action occurs and help overcome difficulties or even failure along the way. To find these explanatory theories, we reviewed scientific papers which explain complex theoretical constructs that explain the variables of implementation effectiveness. Two constructs have already been suggested to have a direct influence on implementation effectiveness; Innovation-Value Fit and Implementation Climate. In this chapter we add two other constructs so we can account for all actions identified in chapter 3: Absorption Capacity and Event System Theory. We discuss the four constructs that describe the thirteen actions to implement effectively to predict the innovation use and employee response.

The first complex theoretical construct explains Innovation-Value Fit, which describes the extent to which the targeted organisational users believe that using the innovation supports (or hinder) the realisation of their values (Klein & Sorra, 1996). The second theory, Implementation Climate, refers to targeted organisational members’ shared perceptions of the extent to which their use of a specific innovation is rewarded, supported, and expected within their organisation (Klein & Sorra, 1996). These two complex constructs are combined by Klein & Sorra (1996) in a model that explains the prediction of employee response and innovation use. This response can be used to identify if the innovation is accepted by the targeted organisational members and what implementation activities the team should focus on.

Thirdly, Absorption Capacity is explained. This is defined as prior related knowledge that confers an ability to recognize the value of new information, assimilate it, and apply it (Cohen & Levinthal, 1990). This accounts for the capabilities of the level of a firm being dynamic and therefore the ability to innovate (Todorova & Durisin, 2007). By using this construct, we explain actions oriented towards the user and the change they are expected to make when using the new innovation.

Lastly, the construct of Event System Theory is discussed. Within this theory, the dynamism of an organisation highlights that events from inside and outside the project scope can affect a project, and in our case influence implementation effectiveness. Events can eventually become meaningful or have impact within the system and need to be addressed by the project team. By shifting attention from the project activities towards dealing with the event, the event becomes more significant than the project. Once the project team focuses more on the event instead of the project, implementation effectiveness declines and the chances of project failure increase. Event System Theory suggests that events become significant when they are novel, disruptive, and critical (Morgeson et al., 2015). By explaining the importance of identifying the strength, time and space of an event, the team is able to address its occurrence and deal with it accordingly so it doesn’t endanger the implementation project.

In summary, our exploration of relevant literature into implementation effectiveness has revealed four key theoretical constructs that highlight why actions occur and how they influence the outcomes. First, Innovation-Value Fit assesses whether using an innovation aligns with the values of the targeted users, influencing employee response. Second, Implementation Climate explains how an organisation supports and rewards innovation use, further predicting innovation use and employee response. Third, Absorption Capacity examines how prior knowledge shapes an organisation's ability to adopt new information, helping employees to change their behaviour. Lastly, Event System Theory underscores the impact of internal and external events on implementation effectiveness, emphasising the need to address novel, disruptive, and critical events promptly to prevent implementation failure. These constructs offer valuable insights for practitioners aiming to predict innovation use and employee response so practitioners can navigate challenges in implementation projects to prevent implementation failure.

4.2.1 Innovation-Value Fit and Implementation Climate

As described before, effectiveness is defined by Klein et al. 1996 as the consistency and quality of targeted organisational members' use of an innovation. They describe two criteria that play a vital role: (a) the strength of an organisation's Implementation Climate, and (b) how well the innovation fits with the values of its intended users, Innovation-Value Fit (figure 4.1). Employee response and innovation use can be predicted by evaluating positive or negative Innovation-Value Fit and Implementation Climate. Both can help implementation teams decide on actions to take to improve their implementation practices.

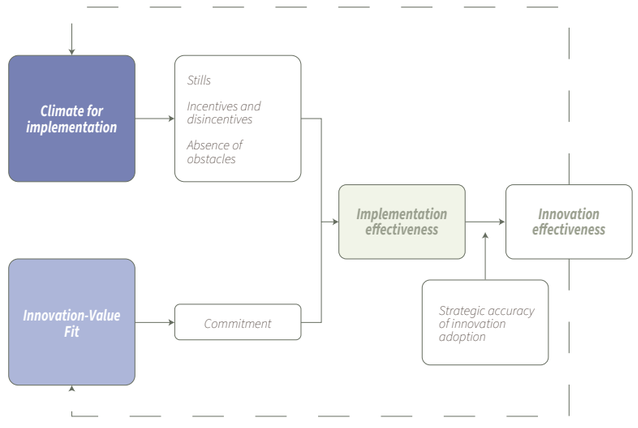


Figure 4.1: The determinants and consequences of implementation effectiveness by Klein et al. 1996

4.2.1.1 Innovation-Value Fit

According to Klein & Sorra (1996), innovation-fit describes the extent to which the targeted organisational users believe that using the innovation supports (or hinder) the realisation of their values. Values are defined as generalised beliefs about the personal and social desirability of ways of behaving or desired life outcomes (Kabanoff et al., 1995). Todorova & Durisin (2007) explained that the importance of these values lies in the exploration of the cognitive structures within individuals and organisations. Their research highlights the role of prior knowledge, suggesting that without it, organisations struggle to assess new information effectively, resulting in a failure to translate it into actionable strategies. The importance of prior knowledge is further explained at section 4.2.2.

Individuals can have values, but so do groups and organisations (Kabanoff et al., 1995), they can all align or differ. Within this thesis, only group and organisational values are addressed, as implementation does also only differ between groups due to similar activities and therefore needs and wishes from individuals within groups are not the focus here. Innovation-Value Fit can be either good, neutral or poor. The fit between innovation and values is good when users see the innovation shows similarly to their most important values.

The value fit is weak when users perceive the innovation as significantly conflicting with their most important values. When users view the innovation as moderately aligned or misaligned with less critical values, the fit is considered neutral (Klein & Sorra, 1996). To ensure values align with the innovation, action 9 can be set in place: "Enhance the quality, accessibility, and user-friendliness of the innovation". Co-development with the user can ensure a better values-match between the innovation and the user.

By evaluating the values of the user and the innovation and matching them, the right innovation can be selected and implementation effectiveness is positively influenced. The decision-making unit, as well as the project team, can benefit from evaluation of the Innovation-Value Fit. They are able to adopt an innovation that fits the user, and project requirements can be more specifically directed towards addressing issues that arise when users are opposing the needed change or rejecting the innovation. Once an innovation fits the values of the group or organisation, the reason for innovating is easy to explain. This accounts for the identified action 12: "Ensure effective communication regarding the reasons for implementing the innovation."

Organisational values

Schein (1992) define organisational values as “implicit or explicit views, shared to a considerable extent by organisational members, about both the external adaptation of the organisation (i.e., how the organisation should relate to external targeted organisational member-users, constituencies, and competitors) and the internal integration of the organisation (i.e., how members of the organisation should relate to and work with one another). Organisational members come to share values as a result of their common experiences and personal characteristics”. These values are important to identify as the innovation should fit the organisational values. The organisational Innovation-Value Fit is mostly accounted for during innovation adoption and thus at the beginning of the project as the decision-making unit of an organisation is mostly responsible for external adaptation and internal integration of the organisation.

Organisational values

Group values are defined by Klein & Sorra (1996) as “shared beliefs, either explicit or implicit, held by members of a group within an organisation, regarding both the organisation’s decision, external factors affecting their work, as well as the group itself. These values are different among groups within the organisation and often reflect the group’s own interests regarding their work tasks and (in)formal social networks.” These group values are important for the project team to take into account during the implementation phase as it can influence the employee response towards the innovation. Higher level executives in the organisations need to know the group values to make a well educated decision on the kind of innovation that needs to be adopted to gain the expected benefits. This is in line with the identified action 1: “During innovation adoption, select innovations by prioritising organisational members’ needs over other considerations” It is difficult to foster all different group values within one innovation, which is why the project team needs to address various groups differently to guard and address their specific group values. This can be addressed by executing action 2: “(Prioritise the development of features and processes based on the needs of targeted members)” Still, organisations are able to make the decisions that might not align with the values of the user, as long as they can justify their decisions as the decision fits the overall strategy of the organisation or most other group values within the organisation.

The actions that are explained by Innovation-Value Fit are:

4.2.1.2 Implementation Climate

To foster innovation, Implementation Climate is important where, according to Klein & Sorra (1996), Implementation Climate refers to targeted organisational members’ shared perceptions of the extent to which their use of a specific innovation is rewarded, supported, and expected within their organisation. It is important for an organisation to foster good implementation policies and practices, as this positively influences Implementation Climate. An example can be action 4: “Prioritise the correct use of innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs)”.

Climate is the result of employees’ shared experiences and observations, information and discussions regarding these policies and practices. Well executed and fitting policies and practices help organisational members see the essence of the change and the innovation which positively influences their attitude towards the implementation & innovation. This also helps employees understand the reason for innovating, which is again in line with action 12.

Organisations often execute multiple (implementation) projects for strategic purposes. Once these projects expect different attitudes or outcomes from the same targeted users, this can negatively influence their attitude and understanding of the innovation. By executing action 6: “Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals” a team can take a coherent approach towards the targeted user.

Project teams can track the Implementation Climate at multiple points within the project. At the beginning of the project, it is important to check if employees were involved in the innovation adoption and get in contact with them to find out the level of attention they need to understand and later accept the changes. This can be done by surveys, team meetings and individual meetings with key individuals within the targeted members. Key individuals can be part of the formal social network, but also informal leaders are of importance to involve in this phase to check if employees feel rewarded and supported and know what is expected, as they help convince others if needed. They can do so by action 13: “Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions.” and action 5: “Provide clear and involved innovation and process support.”

The actions that are explained by Implementation Climate are:

4.2.1.3 Effects on employees' response and innovation use by describing Innovation-Value Fit and Implementation Climate

Klein & Sorra (1996) have suggested a model (table 4.1) for Innovation-Value Fit and Implementation Climate to predict innovation use and the response of employees towards the innovation. With this prediction, project teams can map every group within an organisation to implicit the right response towards their attitudes. They are able to address difficulties and give the 'difficult or critical' groups the attention needed to improve the quality and consistency in use of the innovation accordingly.

Table 4.1: Effects on employees affective responses and innovation use by Klein & Sorra (1996)

	Poor Innovation-Value Fit	Neutral Innovation-Value Fit	Good Innovation-Value Fit
Strong implementation climate	Employee opposition and resistance Compliant innovation use, at best	Employee indifference Adequate innovation use	Employee enthousiasm Committed, consistent, and creative innovation use
Weak implementation climate	Employee relief Essentially no innovation use	Employee disregard Essentially no innovation use	Employee frustration and disappointment Sporadic and inadequate innovation use

4.2.2 Absorption Capacity

As the definition of innovation states something that is (somewhat) new to its developers and/or its potential users (Klein & Knight, 2005), it is expected that the targeted users need to start working with this something new. This means that they need to learn how to use the innovation but also effectively use it during their work. Absorption Capacity explains this as "prior related knowledge that confers an ability to recognize the value of new information, assimilate it, and apply it" (Cohen & Levinthal, 1990). They also argue that the ability and utilisation of outside knowledge is largely related to the level of prior related knowledge. This prior related knowledge is defined by basic skills or a common language that is shared by multiple individuals within a team, department or organisation. To fit this prior related knowledge to the innovation and the new process, a transition must be made from this prior related knowledge, assimilate the given information regarding the innovation and apply it.

To transform the old knowledge into new knowledge, it is important to frequently expose the targeted members to the innovation, let them get to know the innovation and experiment (Cohen & Levinthal, 1990; Klein et al., 2001). We also suggest this with action 11 to "Allocate time for users to experiment with the innovation". The Absorption Capacity of an organisation accounts for the capabilities of the level of a firm being dynamic and therefore the ability to innovate (Todorova & Durisin, 2007).

Once an organisation is executing many innovative projects, the users are bound to get confused with the changes they need to make, which influences the Absorption Capacity of these users. This can be improved by executing action 6: "Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals".

The Absorption Capacity is supported by the organisation when they prioritise training their staff (Cohen & levinthal, 1990). This accounts for practices and beliefs that support and enable employee and organisational skill development, learning, and growth (Klein & Knight, 2005), as mentioned in action 5: "Provide clear and involved innovation and process support". It is not only important to train the targeted members on the features of the innovation that they are using most often, training them in understanding the innovation as a whole, as well as letting them understand the positive outcomes it has for their own work and the organisation helps them to absorb the information more easily. These insights are in line with our findings and conclude in actions 10, 11, and 12: "Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation", "Allocate time for users to experiment with the innovation" and "Ensure effective communication regarding the reasons for implementing the innovation".

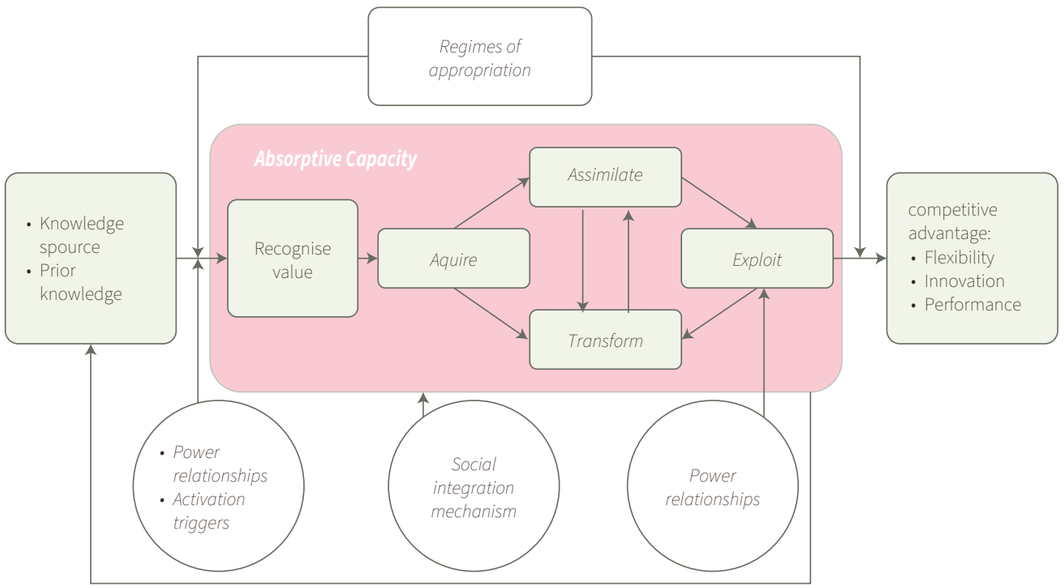


Figure 4.2: The absorptive capacity model by Todorova & Durisin (2007)

The actions that are explained by Absorption Capacity are:

5 Provide clear and involved innovation and process support

6 Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

11 Allocate time for users to experiment with the innovation

12 Ensure effective communication regarding the reasons for implementing the innovation

10 Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

Absorption Capacity

4.2.3 Event System Theory

There are three actions that are not explained yet, actions 3,7, and 8: "Ensure successful handover to the business unit or new project members", "Quickly address unexpected changes to minimise impact", and "Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects". These three actions are difficult to plan for as they can become a sudden event during a project. Event System Theory (Morgeson et al., 2015) suggests that events become significant when they are novel, disruptive and critical. Events happen somewhere (a hierarchical level), at a certain time, and have a certain level of importance. They explain that the effects of the event can travel up, down, or within hierarchical levels. It is important to note that handover can be seen as a plannable event, due to project deadlines but according to practitioners handover often also takes place between individual employees/project team members due to allocation of resources. Therefore we describe handover as a sudden and significant event.

Event System Theory explains that events can influence organisational structures or entities through changing or creating (1) individual or collective behaviour, (2) features, and (3) subsequent events (Morgeson et al., 2015). This can be identified by interpreting an event's strength, space and time. They defined event strength by its novelty, disruption, and criticality. Event space is defined as where an event originates and how its effects spread through an organisation. Event time is identified by when an event occurs, how long an event remains impactful, and the evolution of and event strength. A visual representation of Event System Theory can be found in figure 4.3.

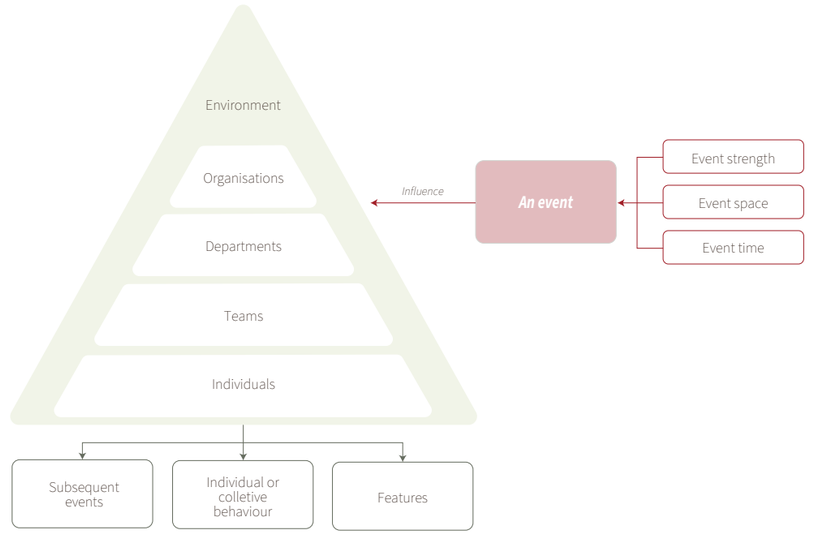


Figure 4.3: Schematic representation of Event System Theory by (Morgeson et al., 2015)

By seeing events as a separate object, the project team is able to quickly analyse an event, and decide on the next steps. Söderholm (2008) explained three categories of how to deal with the occurrence of an event: re-opening, revision and fine tuning.

Fine-tuning of a project is done regularly and can be applied by small implications during a project. For example, project tasks and outside commitments require daily adjustments. In modern organisations managing multiple mid-sized or small projects simultaneously, this fine-tuning is happening constantly. It accounts for a constant flow of information, experiences, and people into and out of the project (Söderholm, 2008).

Revision is the activity of making changes to initial plans and/or goals. This is also part of every-day activities done by a project manager, but it takes more effort in comparison with fine-tuning. It is treated accordingly by giving the event more attention.

Lastly, re-opening which is executed because of a change in stakeholder relations. Stakeholders might not always express a single clear desire or set of demands out loud. Often, their requests are vague or even contradictory, especially when viewed over time. This needs to be accounted for by the project team by re-opening the project requirements as they can 'open' the project to identify new definitions in terms of tasks, time or cost-limits. The project objectives are revised and the project team needs to act according to these new objectives by forming a new project plan.

The actions that are explained by Event System Theory are:

In order to make these changes for all three project adjustments, four practices are proposed by Söderholm (2008):

1. Innovative action: "to creatively design action patterns to deal with un-participated changes including reshuffling of resources, delaying some parts of the project while helping other parts, making use of slack resources in the project or company, or outsourcing. Innovative action is problem solving on-site and short term."
2. Extensive meeting schedule and short term coordination: "closely monitoring a problematic sequence of projects and to assure continuous information flow and commitment-building between team members working on the problem. Extensive meetings include frequent (in some cases daily) decisions on resources or assignments among team members."
3. Detachment strategies: "to isolate the consequences of revisions as much as possible in order to minimise consequences for other parts of the project."
4. Negotiation skills and project safeguarding: " to negotiate with functional departments, steering committees, customers or other stakeholders to have more resources assigned to the project or to change some of the deliverables (time, functionality, etc.) and to ensure project status and resources.

Once the event and its importance is identified, the appropriate action can be taken. This is often a cognitive process, but by explaining the objectives and theories highlighted in this section, project teams can standardise its approach and therefore improve their practices of dealing with unexpected events of uncertainties within a project.

4.2.4 In conclusions

To continue our exploration to improve implementation effectiveness, we've identified four complex theoretical constructs that help to understand why actions occur and how they shape the outcome. First, Innovation-Value Fit examines whether an innovation aligns with users' values, influencing their response and use. Second, Implementation Climate assesses how an organisation supports and rewards innovation use, which also predicts user response and innovation use. Third, Absorption Capacity considers how prior knowledge shapes an organisation's, team's and individual's ability to adopt new information, facilitating change by the targeted user to use the innovation. Lastly, Event System Theory highlights the impact of (unexpected) events on implementation effectiveness, highlighting the need to address them early on to prevent failure due to a shift of focus from the implementation process to addressing the event. These constructs offer valuable insights for practitioners aiming to predict innovation use and employee response and navigate challenges in implementation projects, to ultimately prevent implantation failure.

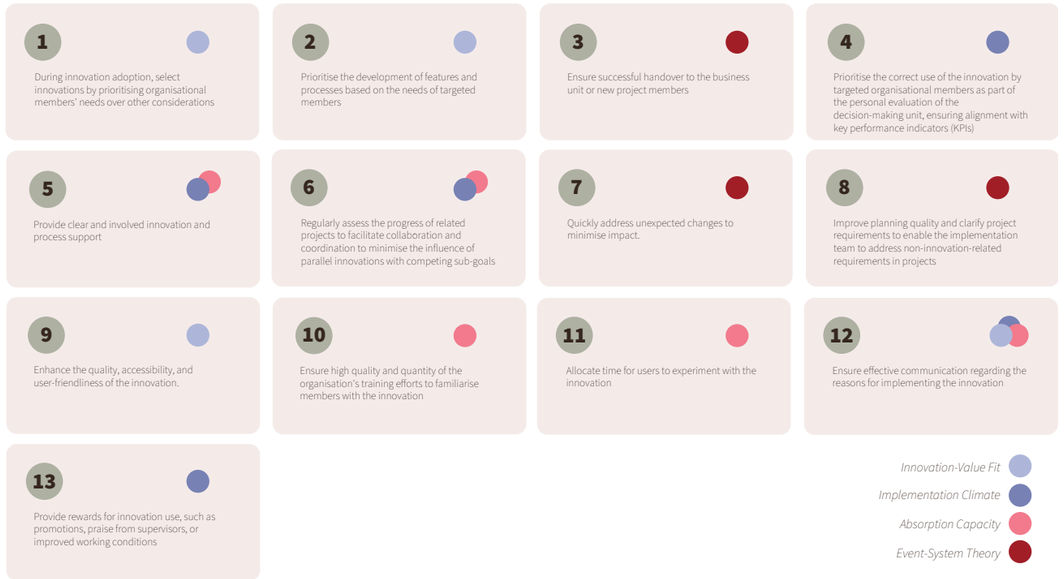


Figure 4.4: A visual representation of the patterns of abstract constructs within thirteen actions

4.3 Practical model on how to implement effectively

As project execution is a process that occurs within different organisations and involves various individuals, these processes inevitably differs in some way. Implementation science dedicates its resources in providing project teams with the right tools to combine the theory into practice and close the evidence-practice gap. For example, the handbook by Nilsen & Birken (2020), which contains several of the most widely used frameworks and models in the field of implementation science. With this handbook, we answer SQ2.2 "How does the literature propose an effective approach to implementation in practice?".

To continue this chapter, the quality implementation framework is reviewed as this framework fits the earlier findings from this thesis. We can use this review to find the answer to RS2.3 "Why doesn't this framework work yet?". This answer to SQ2.3 is used to represent the answer to why implementation approaches developed by implementation science do not seem to be effective. More can be found in section 4.3.1.

The Quality Implementation Framework explains fourteen steps that describe the "how-to" of implementation. It combines information from relevant literature sources, providing insights into the specific procedures and strategies that are important for effective implementation (Meyers et al., 2012) and thus tries to reach quality and consistent use of the innovation. The framework is further elaborated on in section 4.3.2.

Moving forward, we examine the Quality Implementation Framework and incorporate the actions for effective implementation from chapter 3. The result from this analysis continues our puzzle by putting all the pieces together to find if our puzzle is complete in section 4.3.3. As a conclusion, we identified the missing puzzle piece that shows why this particular framework is not working. We conclude and make the first steps to section 4.4 where we further explain this missing puzzle piece and what we suggest to be done in order to improve the framework to elicit effective implementation.

4.3.1 Review of practice literature: handbook of implementation science (Nilsen & Birken, 2020)

In the previous chapters, theoretical models, constructs, and practical reviews have led to the identification of combinations between action and theory that explain the process of implementing innovations in an organisational setting. After this review of descriptive literature, it is important to take a look at the literature focused on practice, or, as defined by implementation science, evidence-based practice literature. Sackett et al. (1996) presented a paper introducing evidence-based practice, defining it as the thoughtful, clear, and careful utilisation of the most up-to-date evidence to guide decisions regarding practice. Evidence-based practice has been used in many fields of research since then and can also be applied in the field of implementation science.

Implementation scholars have executed different studies in understanding how implementation works. They used various methods, including breaking down and explaining the steps involved, or creating sophisticated conceptual frameworks based on research and practical experiences. These frameworks identify essential aspects, stakeholders, and challenges of implementation. This in order to help researchers and practitioners in similar projects. Some frameworks provide practical guidance by outlining specific steps for planning and executing implementation efforts while highlighting common mistakes to avoid.

An example of practice oriented literature can be found in the handbook by Nilsen & Birken (2020), who have reviewed various papers attempting to explain implementation in different ways. In this chapter, we focus on process models as these explain the stages of turning research into practice, including how research is implemented and applied and we specifically dive into action models. Process models describe or guide this translation process, with action models offering practical advice for implementing strategies (Nilsen & Birken, 2020). They describe that these models illustrate how research findings are turned into real-world use, covering how to put research into action and making the most of its results. Process models aim to outline or guide vthis translation process. An action model, gives practical advice for planning and executing implementation efforts to make the process smoother. Models for implementation usually highlight the importance of careful planning, especially at the beginning. In many papers, these models show the process of implementation as a smooth, step-by-step process. However, as mentioned before, it's important to note that the real process doesn't always follow a strict order. The way process models are developed differs. Some are drawn from the creator's own experiences of introducing new practices in different settings, while others are built upon reviews of theories, models, frameworks, and individual studies to pinpoint essential aspects of successful implementation. After reviewing the proposed papers by Nilsen & Birken (2020), the Quality Implementation Framework (Meyers et al., 2012) has been identified to focus on in this thesis as it contains overarching conclusions from previous findings.

4.3.2 The Quality Implementation Framework

During the review of 'how-to-implement' models, the Quality Implementation Framework concluded in similar results as the previous chapters in this thesis, which sparked the interest of diving into more detail. The 'Quality Implementation Framework' combines information from relevant literature sources, providing insights into the specific procedures and strategies that are important for effective implementation (Meyers et al., 2012). The framework focuses on important elements (critical steps and actions) believed to contribute to quality implementation (Meyers et al., 2012). The framework consists of fourteen steps to evoke quality implementation which are logically divided into four phases. These conclusions were derived from an extensive review of 27 relevant studies, which reached considerable agreement regarding the steps involved to achieve effective implementation. It was suggested that quality implementation is a systematic process that involves a coordinated series of related elements (Meyers et al., 2012). Figure 4.4 describes the fourteen steps within the four phases of quality implementation.

The Quality Implementation Framework consists of four phases: Initial Considerations Regarding the Host Setting, Creating a Structure for Implementation, Ongoing Structure Once Implementation Begins, and Improving Future Applications. The complete framework, including all sub-questions per step can be found in Appendix C. Most of these steps appear before the actual implementation phase as described by Rogers et al. (2003), as they are suggested to be executed before adoption (eg. phase 1 & 2). This suggests that careful consideration of various factors at the beginning of the process of implementation, helps guide for effective implementation further in the process. They propose that achieving quality implementation is most effective when combining various activities, such as assessment, negotiation, collaboration, structured planning, and personal reflection.

To conclude, the Quality Implementation Framework reveals that effective implementation relies on a systematic process. The fourteen steps, which are logically divided into four phases, emphasise the importance of careful planning and consideration not only during implementation but also before the actual implementation phase. By integrating activities like assessment, negotiation, collaboration, structured planning, and personal reflection, the framework guides an organisation to achieving quality implementation. This systematic approach aims to enhance implementation processes and promote successful implementation outcomes.

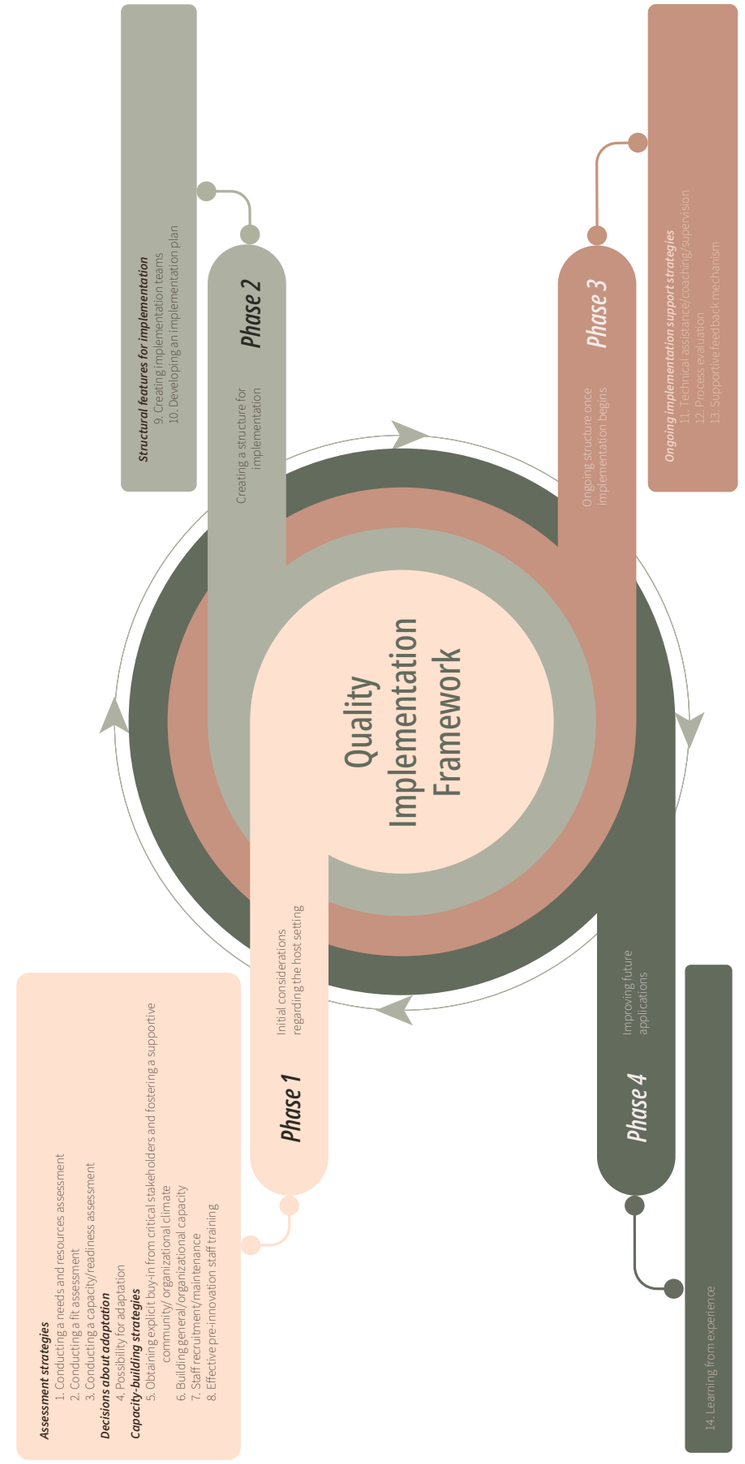


Figure 4.4: The Quality Implementation Framework (Meyers et al., 2012)

4.3.3 Why is the Quality Implementation Framework not working

As can be seen in figure 4.4, the Quality Implementation Framework is formed to describe logical steps for executing an implementation process. It is important to understand 'why' doing these steps with care is important to answer RQ 2.3: "Why doesn't this framework work yet?". The thirteen actions from chapter 3 gives the user of the framework a more indepth idea on why the steps contribute to a more effective implementation. Figure 4.5 gives a visual representation of the steps from the Quality Implementation Framework and the corresponding actions.

By combining the thirteen actions with the fourteen steps of quality implementation it is clear that one action has not been accounted for, namely action 7: "Quickly address unexpected changes to minimise impact". This can be concluded as unexpected events are mostly seen as things that happen 'unexpectedly' and can therefore not be planned for. After consulting with the participants from the interviews, they did, however, highlight a practice that is executed at the beginning of a project to identify obstacles that can lead to significant events within a project. They executed a task to which they referred as: "A risk analysis".

Risk analysis involves identifying and assessing potential future events that could harm a company, individuals or the project. Companies conduct risk analysis to gain insight into potential outcomes, understand the financial consequences, and determine actions to reduce or eliminate these risks (Hayes, 2009). The interview participants from chapter two are consulted on their view of this. They emphasised that doing a risk analysis is standard procedure for the project brief, but is not part of the ongoing activities during the process. By identifying the event early, a risk or obstacle may be tackled or prepared for to minimise effect on the project. In the literature, doing this well can be described by organisational resilience. Organisational resilience is defined as the capacity of an organisation to foresee potential threats, effectively manage adverse events, and adjust to evolving circumstances (Duchek, 2019).

To conclude, the Quality Implementation Framework presents a structured approach to guide the execution of an implementation process. Understanding the significance behind each step is important to achieve effective implementation. Figure 4.5 combines the steps from the Quality Implementation Framework with their corresponding actions for effective implementation. Action 7: "Quickly address unexpected changes to minimise impact" is identified as a crucial aspect often overlooked. Through further discussion with the interview participants from chapter 2, a practice known as "risk analysis" was identified, used at the beginning of a project to identify potential obstacles. Risk analysis involves foreseeing and assessing potential future events that may create a risk and create strategies to mitigate their impact. Effectively conducting risk analysis enhances organisational resilience, enabling organisations to anticipate threats, manage adverse events, and adapt to changing circumstances (Duchek, 2019). Organisational resilience is further discussed in section 4.4.

4.3.4 To conclude

Within this section we focussed on literature research to identify relevant studies that have focussed their resources on minimising the evidence-practice gap. We have answered SQ2.2 “How does the literature propose an effective approach to implementation in practice?” where we reviewed the handbook of implementation science by Nilsen & Birken (2020) which contains the most widely used models and frameworks for implementation execution.

We further investigated the Quality Implementation framework, which contains four phases to implement effectively. These steps, including their corresponding questions can be found in Appendix C. The model suggests that many steps are to be taken, before the implementation phase starts. This suggests that careful consideration of various factors at the beginning of the process of implementation, helps guide for effective implementation further in the process.

We continued by answering SQ 2.3: “Why doesn’t this framework work yet?”. We analysed the Quality Implementation Framework and compared its steps with our thirteen actions from chapter 3. This resulted in one missing piece of the puzzle namely action 7: “Quickly address unexpected changes to minimise impact”.

After consultation with our interview participants, this action is often only executed at the beginning of the project by executing a ‘risk analysis’. Risk analysis involves foreseeing and assessing potential future events that may create a risk and create strategies to mitigate their impact. Effectively conducting risk analysis enhances organisational resilience, enabling organisations to anticipate threats, manage adverse events, and adapt to changing circumstances (Duchek, 2019).

The following section focuses on how organisations can develop to increase their organisational resilience to improve their implementation effectiveness.

4.4 Organisational resilience as the missing piece in the Quality Implementation Framework

As previously identified, an event can turn into an obstacle the team needs to deal with and can take many forms. It becomes more difficult if these obstacles happen unexpectedly. A team has access to the knowledge of many individuals. For example, the project team, as well as the board or even specialists. By planning for early identification of obstacles, it might help the project team to take early action and avoid that events turn into obstacles. This can be done by a process defined by resilience building.

Duchek (2019) claims that “in times of great instability and uncertainty, organisations must build resilience to handle unforeseen challenges, recover from crises, and pave the way for future achievements”. She introduces a capability-based conceptualisation model of organisational resilience which can be found in figure 4.6. This model highlights that organisations take a proactive approach towards events so the organisation can properly cope and learn from the obstacles.

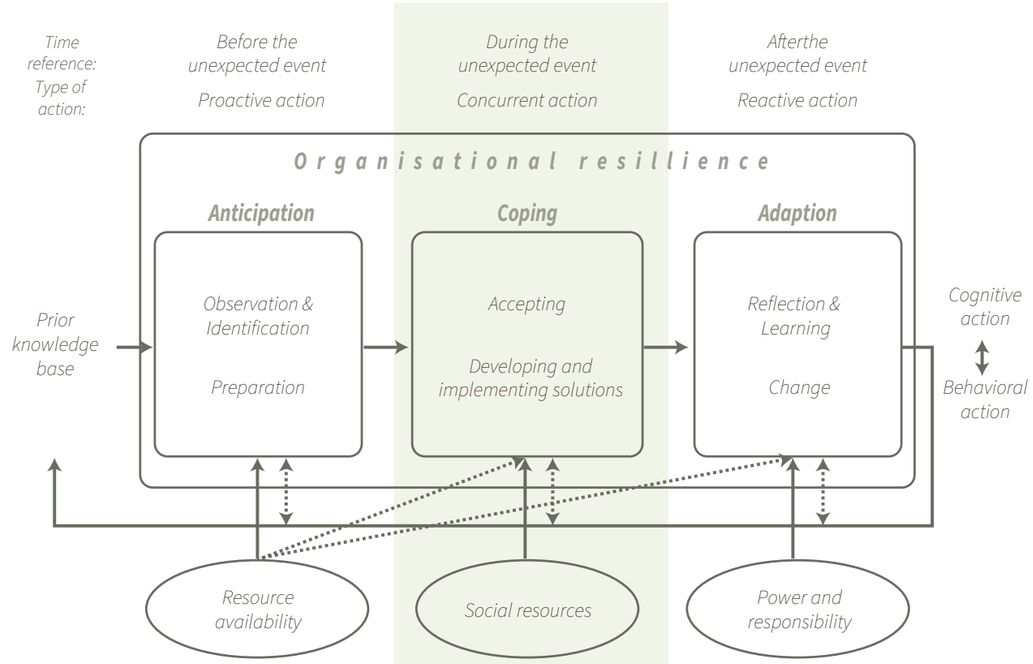


Figure 4.6: A capability-based conceptualization of organisational resilience (Duchek, 2019)

Normally, ‘organisational resilience capabilities develop over time and emerge from the process of coping with threatening situations and unexpected events’ (Duchek, 2019). It can be helpful for a project team to systematically observe all project components and identify possible obstacles to be able to take a proactive approach towards the issue. To execute such a task, organisational resilience can become an activity as part of the practices in place to evoke effective implementation.

In Duchek’s (2009) perspective, a proactive attitude is taken towards unexpected events by introducing anticipation to prevent obstacles. Anticipation involves recognizing significant changes within the organisation or its surroundings and responding proactively to them. This doesn’t mean resilient organisations can avoid every problem. Obstacles usually suddenly emerge and do not announce themselves. Early identification can minimise the potential negative consequences of events which concludes in a more streamlined implementation process.

Building on previous research that includes anticipation in definitions of resilience building, Duchek (2009) states that the anticipation stage is explained by three capabilities: ‘the ability to observe internal and external developments, the ability to identify critical developments and potential threats, and—as far as possible—to prepare for unexpected events.‘ To help organisations identify obstacles (and risks) that may hinder the implementation process of an innovation, the chapter 5 contains the designing phase of a practice oriented artefact that can be used as part of the standard implementation practices within organisations. This artefact focuses on improving the practices suggested in the Quality Implementation framework. This aretact builds on the idea of Simon (1996) to build relevant artefacts with the use of the environment. This artefact is created by a co-creation process with implementation teams.

4.5 Concluding Chapter 4

- At first, we revisited the significant actions identified in Chapter 3, seeking to identify underlying patterns that explain why these actions are important to execute.
- It continued by exploring four complex theoretical constructs to explain these patterns and offers practical implications for practitioners based on our findings. It explains why the different actions can lead to a certain innovation use and employee response which contribute directly to the quality and consistency of innovation use.
- Subsequently, we reviewed relevant practice-oriented literature, particularly focusing on a specific framework which guides implementation processes. Implementation models, such as the Quality Implementation Framework, offer insights designed to enhance practitioners’ execution of implementation practices.
- This framework aligns with our previous research findings and strives to decrease the evidence-practice gap by offering scientifically grounded guidance for implementation.
- High rates of implementation failure imply that this, and similar frameworks, do not solve the problem of failing implementaiton processes. Our analysis identifies a gap within the framework that contributes to implementation challenges and failures by practitioners using the Quality Implementation Framework.
- Further research should be conducted to improve the Quality Implementation Framework and, at the same time, reduce the gap between evidence and practice. This can be achieved by designing practical artifacts that deliver the knowledge from the field of implementation science to practitioners in a user-friendly format.

Design for proactive action to prevent unexpected events

05

5.1 Introduction into designing for proactive action

By completing phase one of this thesis and concluding our analysis of the environment and knowledge base in chapters 3 and 4, we have gathered all the necessary components for effective implementation. We have identified patterns in the thirteen actions for practitioners and evaluated the Quality Implementation Framework. In chapter 4, we identified the missing piece for the execution of effective implementation when practitioners want to use the Quality Implementation Framework. Chapter 5 focuses on answering SQ3: “Can we design a policy or practice that can help practitioners improve implementation practices?”.

According to Simon’s (1996) Design Science Research approach, the process of creation requires action. This process involves collaborating with the user (project teams) to create a relevant artefact. The design process includes a series of actions with practitioners that lead to the development of a new creation designed for proactive action to prevent unexpected events.

To create the artefact, we followed the integrated Creative Problem Solving (iCPS) approach by Heijne & van der Meer (2019). The Creative Problem Solving approach is based on the concept of various techniques for fostering creativity can enhance adaptability and lead to innovative results. A well-facilitated creative process preserves original ideas and promotes further development. This process consists of three phases: Problem finding, Idea finding, and Solution finding. We also included testing phases with a real-world groups to test and improve our artefact. The process of integrated Creative Problem Solving is further explained in section 5.2.

The initial phases of the iCPS approach are conducted during a session with two students from the TU Delft. In this session, they are given a series of tasks to go through the Problem Finding and Idea Finding phases. This resulted in three concepts that could address the problem: “How can a project team continuously identify potential problems during an implementation project”. This session is detailed further in section 5.3.

The third phase of the iCPS approach is carried out with a team of six project leads from an organisation specialised in implementing solutions in the mobility sector. This session focused on the Solution Phase in the iCPS approach to further develop the three concepts from phase 1. Section 5.4 provides more details on this session, where the resource group was asked to identify themes to help project teams pinpoint obstacles within their project. The session concluded with the selection of one concept that addressed SQ3.

Section 5.5 focuses on the further development of the artefact. This artefact is generated through the different iCPS phases discussed in the previous sections, with every phase contributing to its rigour and relevance.

We conclude this chapter with section 5.6 where we test the concept in a real-world setting, which contributes to the rigour of the artefact (Hevner et al., 2004). They argue that testing prototypes is crucial to assess progress towards the desired outcome and to determine if the artefact is innovative and solves an unresolved problem. This test is conducted with an implementation team that has performed a risk analysis, and their findings are evaluated using the proposed concept.

5.2 Approach: integrated Creative Problem Solving

Heijne & van der Meer (2019) assert that by utilising specific techniques, a team can enhance creativity, resulting in original ideas. A well-directed creative process can then preserve these original ideas and foster further development. They argue that three essential steps are involved in creative problem solving: Problem Finding (Defining the problem), Idea Finding (Generating and selecting options), Solution Finding (Improving the options).

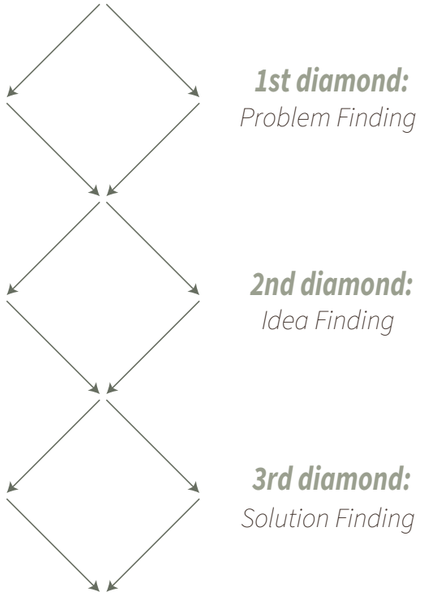


Figure 5.1: The 3 diamonds of the Content Finding sub-process of integrated Creative Problem Solving by Heijne & van der Meer (2019)

Each step is further discussed in sections 5.2.1, 5.2.2, and 5.2.3, respectively. These three steps guide the participants from a general problem to a suitable solution within the given scope, as shown in figure 5.1. Each step is further divided into three sub-steps: diverging (generating as many options as possible), reverging (reviewing all generated options to fully understand their content), and converging (selecting the most promising options from the many available) (Figure 5.2).

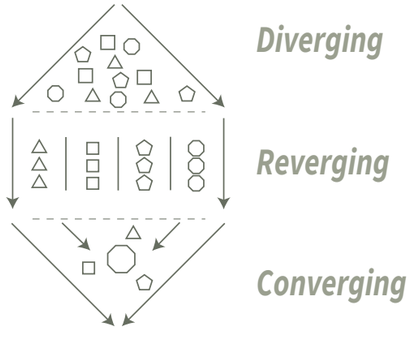


Figure 5.2: Creative diamond according to Heijne & van der Meer (2019)

For this study, a series of sessions have been composed to guide the resource groups in creating a meaningful artefact for solving SQ3: “Can we design a policy or practice that can help practitioners improve implementation practices?” A resource group is defined by Heijne & van der Meer (2019) as a small group of individuals that execute the iCPS process and create the content. This resource group is tasked with creating an artefact to find the missing piece of the puzzle. The problem accompanied by this puzzle piece is stated as: “How can an implementation team periodically identify (future) obstacles that can become critical within a project?”

The sessions are organised and managed by the researcher of this study, who function as ‘facilitators’. Each session consists of a series of exercises that lead the resource group towards the end goal for that specific session. We further elaborate on the sessions in sections 5.2.1, 5.2.2, and 5.2.3. We conclude this chapter by explaining the process of creating rigour in our artefact. Creating rigour in our artefact enhances usability which contributes to solving our puzzle and improving effective implementation for practitioners.

5.2.1 Problem finding phase: restating the Problem

As stated by the iCPS approach, the first phase is dedicated to problem identification. In this phase, the resource group performs three tasks following the creative diamond model. The objective of this phase is to rephrase the problem in order to establish a common understanding of the issue that is addressed during the idea generation stage. The findings from this phase can be found in section 5.3.

5.2.2 Idea finding phase: generating concept ideas

To generate an idea for restated problem in the Problem Finding phase, a session was held with the same resource group as in the Problem Finding phase. The resource group was asked to complete three tasks. The Idea Finding phase of the iCPS approach aims to generate multiple ideas for the problem and select three options. Section 5.4 contains the conclusions drawn from this phase.

5.2.3 Solution finding phase: creation of content for the concepts resulting to concept selection

The last step in the iCPS approach is the solution finding phase. This phase involved a team of six project leads from an organisation specialising in implementing mobility solutions. The session starts with an introduction to the subject of this thesis, followed by a creative brainstorming session. Three techniques are used to generate content for the concepts. The resource group was asked to come up with various themes to stimulate obstacle recognition. The findings of this phase are described in section 5.5.

Concept selection by using the Weighted Objective Approach

The aim of the third session is to choose the final concept. The resource group was requested to rank the different concepts and apply the Weighted Objective approach by Boeijen et al. (2014) to determine the most promising concept. This method utilises objectives that the concept must adhere to and assigns a score to the importance of each objective in solving the problem. The objectives used for analysis are identified by tasking the resource group to pinpoint the crucial aspects of an artefact for obstacle identification. Each concept was assigned a score for each objective, ranging from 1-10, resulting in a total calculated score for each concept. The concept with the highest score is considered the preferred one. This concept, including the themes, are used for further development in the next phase: Creating rigour through user testing.

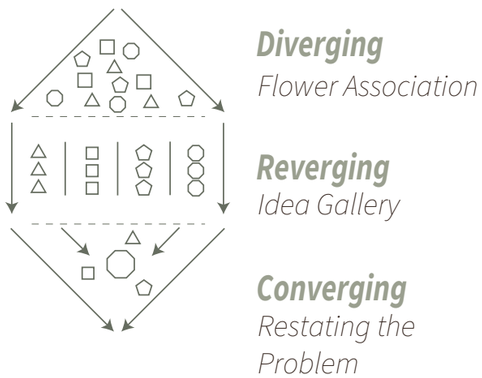


Figure 5.3: This phase comprises three techniques. They are further explained in Appendix D.1.

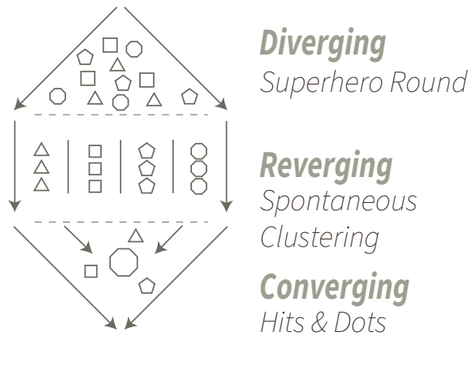


Figure 5.4: This phase was implemented using the following techniques, elaborated on in Appendix D.1:

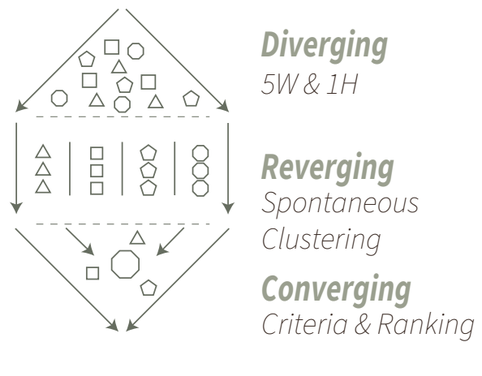


Figure 5.5: The techniques (further explained in Appendix D.1) used during this phase include:

5.2.4 Create rigour: testing the artefact in a real-world setting

Hevner et al. (2003) suggest that in order to create relevant artefacts for practitioners, a design artist must rigorously demonstrate usability, quality, and efficiency through well-executed evaluation methods. In a business setting, implementation teams establish the requirements for evaluation as they represent the targeted users of the artefact. Evaluation can be achieved by integrating the artefact into the business environment.

A series of two test sessions are designed to test the final concept selected during session 3. In test session 1, an organisational setting is simulated by using a resource group that functioned in a make believe organisation. They are tasked with an example case where they act as an implementation team leading the process of implementing an AI Chatbot for a financial service provider. Acting as different team members, the group was asked to identify obstacles at two stages in their implementation process. The goal of this session was to test the concept's usability, quality, and efficiency. This was done by testing the artefact during two example phases as if they were using the concept during different steps in the process of implementation.

Session 2 was conducted in a real-world organisational setting with an implementation team. They are asked to test the concept in a team meeting session to further assess its usability, quality, and efficiency by identifying obstacles in the early stages of the implementation process. At the end of the test session, participants are asked to provide feedback on the artefact by filling out a Google Form. This tool contained questions about the Obstacle Board and requested feedback for further development. The conclusions can be found in section 5.6.

5.2.5 To conclude our approach

Heijne & van der Meer (2019) propose a structured approach to integrate creativity in problem-solving. The three step approach contains the phases Problem Finding, Idea Finding, and Solution Finding as crucial stages. Through a series of sessions, this study applies these steps to address the question of improving implementation practices to find the missing piece for improving the Quality Implementation Framework. This approach is used to create an artefact for the problem: "How can an implementation team periodically identify (future) obstacles that can become critical within a project?"

The Problem Finding phase involves the techniques Flower Association, Idea Gallery, and Restating the Problem, which are all aimed at defining the problem clearly. Idea Finding focuses on generating concept ideas, utilising methods such as Superhero Round, Spontaneous Clustering, and Hits & Dots to generate and select options. Lastly, the Solution Finding phase involves creating content for selected concepts, utilising the techniques 5W & 1H, Spontaneous Clustering, and Criteria & Ranking to identify themes to easier identify obstacles.

The final concept is selected through use of the Weighted Objective Approach. Rigorous testing of the chosen concept in simulated and real-world settings follows, aiming to assess usability, quality, and efficiency. This process concludes in a comprehensive understanding of a design process to create an artefact that improves effective implementation. This artefact is created to enhance the Quality Implementation Framework to meet all the thirteen actions proposed in this thesis and finalise the puzzle.

5.3 The first ideation phases

As proposed by Heijne & van der Meer (2019), the first two stages of integrated Creative Problem Solving contain Problem Finding and Idea Finding. During the Problem Finding phase the goal is to redefine the problem and achieve agreement among the resource group regarding the issue being addressed, enabling continuation to the following phase: Idea Finding. The initial problem that is adressed within the two sessions states: “How can an implementation team periodically identify (future) obstacles that can become critical within a project?”. During the idea finding phase the goal is to create numerous ideas that solve the problem and choose the three most promising ideas. The findings from the Problem Finding and Idea Finding phase are further explained in respectively Appendix D.2 and D.3.

This session was conducted with two students from TU Delft who are not related to the subject. They were selected because they would maintain an open-minded attitude towards the problem, being less concerned with applicability. This is suggested to happen when the resource group consists of experienced practitioners in the field who are unfamiliar with iCPS techniques. The session was conducted in Dutch to ensure fluency in idea generation.

The session took place at the faculty of Industrial Design Engineering, which provided a neutral environment. Each session lasted 50 minutes, with a break in between that lasted 10 minutes. After the break, the team engaged in a brief energising exercise to regain focus on idea generation and increase participants’ energy levels. Throughout the session, the facilitator supplied the resource group with flip-overs, post-its, and whiteboard markers as needed.

The final goal of the session is to generate three valuable concepts. These concepts are further developed by the researcher. This development enhances the concepts by first giving a brief description, identifying the user, frequency of use, options for use and method. These concept developments are further elaborated on in section 5.3.3.

Figure 5.6: Picture from session 1: Proplem & Idea Finding session

5.3.1 Findings

Problem as Perceived: finding of the Problem Finding phase

The first phase of the integrated Creative Problem Solving (iCPS) approach focuses on establishing a common understanding of the problem. This phase includes three key stages that are carried out with the resource group. The initial problem statement (PaG), “How can an implementation team periodically identify (future) obstacles that can become critical within a project?” was analysed using three techniques: Flower Association, Idea Gallery, and Restating the Problem. The resource group simplified the problem statement (PaP) to: “How can an implementation team continuously identify problems within a project?”

Three concepts: findings of the Idea Finding phase

In the second phase, Idea Finding, three key techniques were used to solve the problem “How can an implementation team continuously identify problems within a project?”: the Superhero Round, Spontaneous Clustering, and Hits & Dots. The resource group aimed to generate three viable concepts. During the Superhero Round, participants brainstormed ideas by impersonating different personas, resulting in 111 ideas. Through Spontaneous Clustering, the resource group organised these ideas into eight clusters each with a corresponding theme. Finally, with the Hits & Dots technique, the group selected the most promising options using sticker-based voting, choosing three concepts for further development: The obstacle board, Regulage questionnaires, and Introspecting. These selected ideas are briefly elaborated on in the following section.

5.3.2 The development of three concepts

To enhance obstacle identification practices during project implementation, the second part of the creative session focused on generating ideas. This session served as a tool for brainstorming and ideation, with the aim of generating innovative solutions to the problem identified in the first part of the session. The aim of the artefacts is to stimulate proactive approaches to obstacle identification. The project team is able to mitigate risks, optimise resources, and ultimately achieve effective implementation.

Three concept artefacts were developed from the results of the Idea Finding phase. Concept 1 involves using questionnaires to systematically gather insights from stakeholders. Concept 2, introspecting, highlights past experiences to anticipate obstacles after which future implementation activities are evaluated to identify obstacles. Concept 3 introduces the obstacle board, facilitating real-time tracking and collaboration. These concepts showcase practical tools for effective implementation, promoting transparency and collective problem-solving within the project team. Further details of the three concepts can be found in Appendix D.4.

5.3.3 To conclude the Problem Finding and Idea Finding phases

The initial phases of integrated Creative Problem Solving (iCPS) focus on Problem Finding and Idea Finding. The Problem Finding phase aims to redefine the problem and reach consensus among the resource group regarding the issue being addressed. This phase is crucial for guiding subsequent idea generation. Techniques such as Flower Association, Idea Gallery, and Restating the Problem are used to explore and clarify the initial problem statement. The simplified problem statement derived from this phase is: “How can an implementation team continuously identify problems within a project?”

In the following Idea Finding phase, numerous solutions are generated and the three most promising ideas are selected for further development. Techniques such as the Superhero Round, Spontaneous Clustering, and Hits & Dots are employed in this phase to facilitate idea generation, clustering, and selection. The group used stickers for voting to select the most promising options, resulting in three concepts for further development: The Obstacle Board, Regular Questionnaires, and Introspecting.

This section concludes with the development of the concepts by explaining their targeted users, frequency and options for use and an explanation of the method used. The three concepts, questionnaires, introspecting, and the obstacle board, aim to improve obstacle identification practices during project implementation. The three concepts are the starting point for concept selection discussed in section 5.4.

5.4 Creation of themes to stimulate obstacle recognition

To continue the creation of an artefact to add to the puzzle, a second session was executed with target users from the field. An organisation, specialised in mobility implementation, selected a team of project leads who participated in this session. The session was focussed on the further development of the artefact by executing the third phase of the iCPS approach: Solution finding. This phase is used to improve the concepts created by the first resource group. The goal of this session is to identify factors that help the end-user identify obstacles by providing triggering themes. These themes consist of different factors that can influence an implementation project. The group is also tasked to select one concept which is the final artefact, and which is further developed for the testing phase.

This session was executed in the office building of the resource group. This accounted for a creative and familiar setting for the team. The six project leads have different levels of experience of executing implementation projects, ranging from 8 months to 12 years. The background knowledge into the subject gave the outcomes more rigour, as the solution is based on experiences from the end-user. The session lasted two hours, with one hour specifically designated for sharing information about this thesis and discussing its usability of its conclusions.

The session began with an informative component that highlighted the findings of this thesis. This was done to provide background knowledge for the session. The resource group was then given the task of implementing three techniques to solve the problem and identify the various factors that influence the implementation process: 5W & 1H, Spontaneous Clustering, and Criteria & Ranking. Finally, at the end of the session, the resource group was tasked with using the Weighted Objective Approach to select one concept. The details of this session can be found in Appendix D.5.

5.5 Proceeding to create an artefact: the Obstacle Board

The problem has been clarified and we have generated ideas with potential. Now, we can proceed to further develop the idea into a concept. This step involves expanding on the idea generated in section 5.3 and selected in section 5.4, with the content obtained in the second session: The Obstacle Board.

To further explain this concept, section 5.5.1 describes the general method and provides a more detailed explanation of the frequency and general use of the concept. Section 5.5.2 focuses on the targeted user and how various work approaches affect the utilisation of the Obstacle Board.

5.5.1 How to use the Obstacle Board

The Obstacle Board (Table 5.1) is a tool designed to assist project teams in identifying obstacles on a regular basis. It serves as a visual representation of the various phases of a project, highlighting the different themes and subjects that can impact its implementation. The board features a table structure in which the project team is asked to hang post-its that represent obstacles. The process of identifying obstacles is an activity executed by the project team and aims to evoke discussion beyond the regular updates that are given during team meetings by giving the team members the opportunity to express their concerns and issues. By raising these concerns, other team members are able to join the discussion which has the goal to evoke the identification of latent concerns which otherwise are overlooked.

The vertical axis of the table provides the different themes identified in the second session. These themes are accompanied with prompting sub-themes to help to help guide the project team to subjects that can influence implementation that influence implementation. For example: The main theme “Strategy” is further explained by the sub-themes “Objectives, Planning, Execution, Evaluation and adaptation, Monitoring and control”. These themes are considered as influencing factors during implementation processes, but it may differ per organisation or project. Therefor, one row is left for the team to fill with a theme that they consider important, but is not yet included.

The horizontal axis contains different project phases that guides the team in recognizing obstacles from the current project phase to the upcoming one. Additionally, it provides space for identifying obstacles that may not be relevant in the immediate future but could become significant later on.

By executing this exercise on a regular basis, the team gets more acquainted with recognising obstacles in the project. A novel project team is suggested to use the artefact on a more regular basis, whereas more profound teams already gain its benefits when using the tool at the start of a new project phase.

Table 5.1: The Obstacle Board

	Risks	Do any obstacles arise in the upcoming phase?	Future risks
Strategy *Consider:* *Objectives, Planning, Implementation, Evaluation and adjustment, Monitoring and control, mission and vision organisation, Others projects*			
Stakeholders *Consider:* *Employees, Customers, Suppliers, Investors/shareholders, Government agencies, Competitors, Communities/ neighbour’s, Media, Interest groups, Industry associations.*			
Attitude *Consider:* *Openness, Flexibility, Willingness to change, Willingness to risk, Creativity, Entrepreneurship, Collaboration, Patience, Perseverance, Positive attitude..*			
Budget *Consider:* *Revenue, Expenditure, Forecasts, Allocations, Cost estimates, Reserve funds, Contingent funds, Financial targets, Financial reports, Monitoring.*			
Time *Consider:* *Task duration, Start date, End date, Dependencies, Milestones, Critical path, Task sequence, Resource allocation, Timeline, Gantt chart.*			
Image *Consider:* *Brand identity, Reputation, Visual presentation, Communication strategy, Stakeholder perceptions, Quality of deliverables, Reliability, Transparency, Customer satisfaction, Market perception.*			
(Internal) work process *Consider:* *Task identification, Task assignment, Planning, Implementation, Monitoring, Evaluation, Adjustment, Communication, Documentation, Reporting*			
External factors *Consider:* *Economic conditions, Competition, Laws and regulations, Technological developments, Societal trends, Political situation, Demographic changes, Environmental factors, Customer preferences, Market conditions*			
(Technical) infrastructure *Consider:* *Hardware, Software, Network equipment, Databases, Servers, Cloud services, Communication systems, Security facilities, Back-up and recovery systems, Monitoring tools*			
_____ *Consider:* _____ _____			

5.5.2 Two work approaches and its influence on the Obstacle Board.

Project teams can have different status quo regarding team meetings. Some teams prefer meeting in person, especially when important meetings occur. Other teams prefer meeting in an online environment like MS Teams. Both ways of meeting have their pros and cons. We elaborate on both uses.

Online meeting

When the project team prefers to work online, they can utilise an online whiteboard tool (e.g. Figma, Miro, MS Workspace) to identify obstacles. The team can collaborate in real-time by adding post-its and continue to add more even after the session has ended. Online teams also have the advantage of easy access to their content. They can review the session outcomes anytime and present their findings during other meetings. This approach saves time as it simplifies processing and distributing information to other project stakeholders.

One potential drawback of conducting obstacle identification sessions online is that team members need to have a strong understanding of working with online workspaces. Otherwise, their limited knowledge may hinder the flow of the meeting and prevent them from effectively identifying latent obstacles.

Offline meeting

If the project team prefers to meet in person, they can develop a physical tool called the Obstacle Board, which can be located in the office. The Obstacle Board can be drawn on a whiteboard, providing a space for the team to gather and collaborate in a meeting setting. These sessions promote obstacle recognition through fluid discussions on various identified subjects.

One disadvantage of this approach is that processing the obstacles for further distribution requires more effort due to the need for handwritten notes. Additionally, tracking the development of obstacles over time becomes more challenging as the meeting results are not readily available at all times.

To suggest: the preference lies with the team and project lead

As every implementation project is unique, teams also operate differently. Therefore, it is recommended that teams establish their preferred working method. Both alternatives have pros and cons, and it is up to the project lead to determine which option is most suitable for the team. As a suggestion from the resource group, it is advisable to initially hold a team session to familiarise everyone with the Obstacle Board and its functioning. This session is recommended to take place in a physical setting.

5.6 Create rigour by testing the artefact in a simulated and real-world setting

The four subjects identified in the initial concept serve as guidelines for subsequent development. Firstly, section 5.5.1 describes the general method and provides a more detailed explanation of the frequency and general use of the concept. Secondly, section 5.5.2 focuses on the targeted user and how various work approaches affect the utilisation of the Obstacle Board. Hevner et al. (2003) propose that, in order to develop artefacts suitable for practitioners, designers must thoroughly investigate usability, quality, and efficiency using evaluation techniques. In a corporate context, implementation teams define the evaluation criteria as they embody the intended users of the artefact. Integrating the artefact into the business environment enables the evaluation process.

This paragraph contains the conclusions of two test sessions. The first session was executed with a resource group consisting of different implementation team members from various organisations, who carry out projects on a daily basis. This group was tasked with impersonating a team that was assigned to implement an AI Chatbot for a financial service provider. The conclusions of this session is further elaborated on in section 5.6.1.

The second session was conducted with a real-world example of an implementation team. This resource group is currently in the early stages of an implementation project and wanted to further develop the risks identified during the risk analysis. They tested the Obstacle Board in an online session format, and the findings can be found in section 5.6.2.

To conclude this section, paragraph 5.6.3 focusses on suggestions for further development. This is needed to enhance the artefact developed during this thesis, and improve the usability of the tool in day-to-day activities in the project.

5.6.1 Test session 1: example case

Test session one aimed at testing the general workflow of the obstacle board and gathering insights into the usability and viability of the tool. This part of the session lasted 32 minutes. The team was given a handout with information about the financial service provider, a general introduction, and a role in the team (eg. project lead or IT specialist) before being given the time to get acquainted with the simulated situation. The handout contained information about fictive organisation, the AI chatbot and the process the team would do to implement the innovation. The handout can be found in Appendix F. It was written in Dutch because the session was conducted in Dutch to ensure fluency.

In Appendix D.6, we discuss the details and some insights from the session as well as feedback and suggestions for further development of the Obstacle Board.

Execution of test session 1

The session began with a brief introduction to the empirical groundwork for the artefact's development, followed by the testing of the artefact. The project lead of the team was informed on how to use the Obstacle Board before the meeting so they could lead the session. This allowed the researcher to observe the session.

The session was executed in an online environment where the resource group, containing four project team members, were able to participate through discussion. The project lead led the meeting where the researcher assisted by filling in the post-it notes. This was decided as the project lead was insufficiently acquainted with online whiteboards which could hinder the fluency of the meeting. The session lasted 52 minutes and resulted in the identification of 7 new obstacles. The session was executed in Dutch to retain fluency. Due to confidential reasons, recording the meeting was not possible. Therefore the data contains notes from the researcher regarding the execution. The participants were asked to fill in a feedback form conducted in MS Forms. The results are discussed in Appendix D.7.

5.6.2 Test session 2: real-world testing

The final step in creating rigour in our artefact and completing the last puzzle piece is to conduct a test with an implementation team currently working on an Electronic Health Record project. This team is being assisted by an external organisation that specialises in implementation processes. Their task is to test the Obstacle Board and provide feedback on its usability, quality, and efficiency.

To conclude test session 2

The second phase of testing the artefact aimed to investigate the usability, quality, and efficiency of the concept. This study included a user test conducted in a real-world environment with an implementation team responsible for implementing an Electronic Health Record. The session took place in an online environment where the project lead guided the team in using the tool known as The Obstacle Board. This tool assisted the team in identifying unidentified risks for the project and describing potential issues that may arise during the upcoming implementation phase.

The team suggested further development in the areas of time management and interaction, specifically due to the online setting and their lack of experience with online whiteboards. Positive feedback was given regarding the prompting themes, as they helped identify gaps in the risk analysis conducted earlier in the project.

The results of this session will serve as a starting point for further development of the artefact. This will involve addressing the feedback received, as well as considering suggestions for implementing the artefact in an organisational setting.

To effectively use this artefact in practice, additional testing is recommended. Several suggestions were made during the feedback session, such as limiting the time spent per theme and adding colours to post-its to assign actions to the obstacles. These features can assist project teams in efficiently identifying obstacles by personalising the tool to suit their specific needs.

5.6.3 To conclude the test phase

To conclude, this section focuses on testing the Obstacle Board, which aligns with Hevner et al.'s (2003) recommendations. They propose that in order to create artefacts suitable for practitioners, designers must thoroughly investigate usability, quality, and efficiency by using evaluation techniques. In a corporate context, implementation teams define the evaluation criteria as they represent the intended users of the artefact. Integrating the artefact into the business environment facilitates the evaluation process.

Sections 5.6.1 and 5.6.2 provide insights into the methodology, considerations for the targeted users, and the importance of usability, quality, and efficiency in artefact development, in accordance with the recommendations by Hevner et al. (2003). Two test sessions, one simulating an AI Chatbot implementation and another involving a real-world Electronic Health Record project, demonstrated the effectiveness of the Obstacle Board in identifying and addressing project risks. The sessions highlighted the need for further development, particularly in terms of time management and interaction, especially in online settings where fluency can be affected.

Positive feedback emphasised the tool's ability to stimulate discussions, identify gaps in risk analysis, and enhance collaboration within project teams. These findings serve as a foundation for ongoing development efforts, which aim to refine the tool based on user feedback and prepare it for implementation in organisational settings.

5.7 Concluding chapter 5

- After completing a thorough investigation of the environment, as well as the knowledge base regarding effective innovation implementation, we continued this study with the creation of an artefact that improves the Quality Implementation Framework in line with Simon's (1996) Design Science Research approach.
- This was executed by using the integrated Creative Problem Solving (iCPS) approach by Heijne & van der Meer (2019), consisting of three phases: Problem finding, Idea finding, and Solution finding.
- Initial phases involved tasks with TU Delft students to generate concepts for continuous problem identification in projects.
- Subsequent phases with project leads from a mobility sector organisation focused on refining these concepts into a viable solution.
- The developed artefact, the Obstacle Board, was tested in a real-world setting, enhancing its rigour and confirming its relevance (Hevner et al., 2004). This testing phase assessed the artefact's effectiveness in solving identified problems that can occur during an implementation process and can elicit major impact.

Conversion of this thesis for use by practitioners

06

6.1 Introduction

As previously discussed, the purpose of this thesis is to assist organisations in improving their implementation effectiveness. The preceding chapters have focused on integrating various research perspectives to provide a comprehensive understanding of the implementation process, its influencing factors, practical action steps, project execution, and a tool to enhance the practical approach. Collectively, these chapters address the question of how to implement effectively. However, despite this knowledge, there remains a gap between evidence and practice. Therefore, the objective of this chapter is to suggest options for transforming the insights of this thesis into a format that is suitable for practitioners.

According to Nilsen & Birken (2020), the evidence-based movement advocates for basing practice on the latest, reliable, and trustworthy research findings in order to support practitioners in implementing scientifically validated approaches. However, it has been observed that translating evidence-based practices into action can be challenging, as the evidence often fails to reach practitioners. Chapter 6 offers insights on bridging the gap between evidence and practice by proposing various perspectives on how to apply the insights from this thesis. It also discusses effective communication strategies for conveying the findings of this thesis to technology-focused and management-focused audiences, as these groups require different approaches for acquiring knowledge. This approach allows practitioners to maximise the benefits provided by the tools, while also enabling researchers to expand and evaluate them, thereby contributing to the development of a growing knowledge base.

Section 6.2 of this chapter begins by providing a concise summary of the key findings of this thesis. The intention is to offer practitioners a resource that outlines the topics discussed and the main insights obtained. This section consolidates the collective insights of this thesis to serve as the foundation for creating a tool that can be utilised by practitioners.

In order to propose a more practical approach for presenting the findings to practitioners, section 6.3 is dedicated to describing two tools for reaching them. These tools include a passive approach (a handout) and an active approach (a seminar), both of which cover the content outlined in section 6.2. We explain how these tools can be implemented and discuss the potential impact of these designs. The goal is to target management-focused practitioners who require sufficient information to assess the value of implementing these tools in their organisations. This section also provides details on how to distribute these tools effectively.

6.2 Combining all the findings and create the content for the artefact

“Is it possible to create an artefact that educates practitioners and improves implementation effectiveness?” This question suggests that we should start by identifying the insights we want to share with practitioners. Mintjes (2023) proposes four elements that scholars should include in the creation process of their learning tool: entrepreneurial learning, knowing your audience, action-oriented tools, and reflection. While these elements primarily focus on entrepreneurial learning, we believe that practitioners and entrepreneurs engage in similar activities, making these elements applicable for both. For example, entrepreneurs often translate innovative ideas into practice, just like implementation teams. There are also similarities in the level of problem-solving activities for both innovation and risk anticipation.

To create artefacts that practitioners can use, we need to prioritise entrepreneurial learning. Instead of expecting practitioners to read extensive information about the origins of a theory, it is more effective to have them start using the tool right away. It is crucial to provide a concise explanation that includes direct activities, exercises, and immediate objectives.

As Mintjes (2023) suggests, it is crucial to determine the intended audience before developing the artefact that practitioners can learn from. It is important to consider the stage at which the desired information is used and decide if it should be presented in a step-by-step manner or in a more comprehensive approach. In this thesis, we adopt the step-by-step approach, in line with the Quality Implementation Framework. The framework also follows the action-oriented approach, which is the third element of entrepreneurial learning. We enhance this approach by incorporating the other findings in a similar manner.

The final step recommended in entrepreneurial learning is to incorporate reflection. This is also advocated as part of the implementation process proposed by Rogers et al. (1996). Therefore, we include a step that emphasises reflection by looking back on previous steps in the process and considering ways to improve them in future implementation projects.

6.2.2 The content: how can practitioners learn to implement effectively

Within this study, we explore how the analogy of a puzzle can be effectively used for implementation. Our artefact should include all the puzzle pieces required for effective implementation and integrate all the findings into a coherent and user-friendly artefact. To accomplish this, we need to first consolidate the insights from this thesis into a summary, which will serve as the content for the artefact. The content will include a description of the following elements:

1. The Quality Implementation Framework: Fourteen steps for effective implementation
2. Thirteen actions to consider to achieve effective implementation during the Quality Implementation steps
3. The Obstacle board, to regularly identify obstacles and minimise their impact
4. The four complex theoretical constructs and tools that explain how to determine if these constructs can be verified

A roadmap has been proposed to show a coherent approach of the main findings of this study (see Appendix G). This roadmap highlights the fourteen steps towards Quality Implementation, including the different actions and elements per each step. This content segment shows the interaction between the different steps of the Quality Implementation Framework, the four complex theoretical constructs, and the Obstacle Board.

The following content segment represents a deeper explanation of each step. An example of step 2 is shown in figure 6.1. Each step has a similar content buildup, except for step 1, as reflection can not be executed on a previous step. Every step starts with reflecting on the previous step so the implementation team is able to improve their practices for the following steps. The second task is to answer several questions to reach the goal of each step. The goal of the step is depicted in the title. Once the questions have been answered, the team is asked to execute the Obstacle Board exercise to identify obstacles regarding the following phase and in regards to the content created while answering the questions. Each step ends with an exercise in regards to the complex theoretical constructs. This step will be further elaborated on in section 6.2.3. By completing every step of this roadmap, including the accompanied exercises, implementation teams will be able to improve their implementation endeavours. The complete content can be found in appendix G.

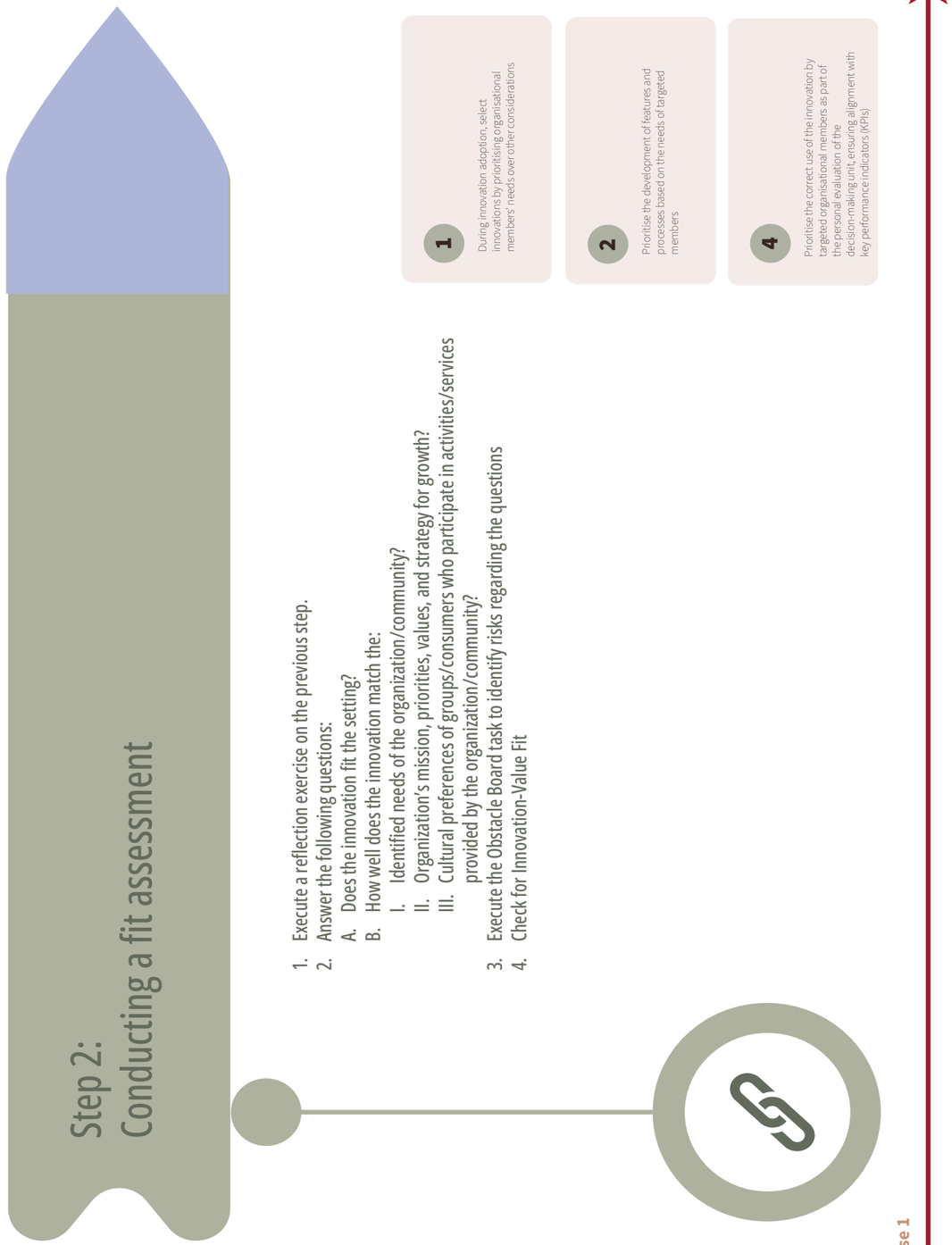


Figure 6.1: Example segment of the content of the artefact: step 2

6.2.3. Exercises to check for the complex theoretical constructs

Within this thesis, we discussed four complex theoretical constructs and how they influence implementation effectiveness. However, we have not discussed how to verify the different constructs. This is needed, as suggested by Mintjes (2023) as we need to create action oriented artefacts. For this, we consulted the organisation Strategyzer, who create scientifically proven tools which aim to clarify and simplify complex business challenges (www.Strategyzer.com, n.d.). This organisation has developed several artefacts to "turn ideas into business models using the renowned, ready-to-use models and canvases." An example of their work is the business model canvas by A. Osterwalder et al. (2013).

The content can be assessed in more detail in Appendix G.

How to check for Implementation Climate

The first complex construct to discuss is Implementation Climate. We propose a tool to assess Implementation Culture called Innovation Culture Readiness (see figure 6.3). Implementation teams can use this tool to evaluate the organisation's readiness to support and foster innovation. We have renamed this tool the "Implementation Culture Readiness" tool. It focuses on three areas: leadership support, organisational design, and innovation practice. These areas align with our previous findings on Implementation Climate.

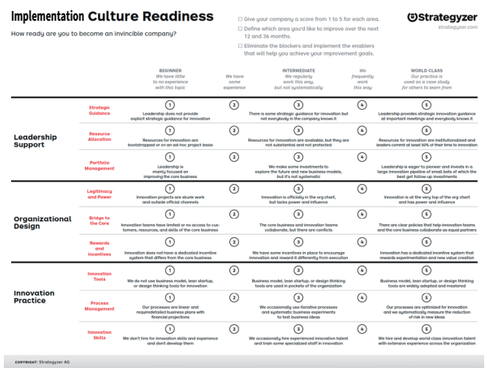


Figure 6.2: The Innovation Culture Readiness test

How to check for Innovation-Value Fit

To assist practitioners in assessing the Innovation-Value Fit in their projects, we recommend using the Value Proposition Canvas, shown in figure 6.4. The Value Proposition Canvas is a tool that helps identify the primary Jobs-to-be-done of the customers (targeted organisational members), the challenges they encounter when trying to accomplish these jobs, and the benefits they perceive from successfully completing them.

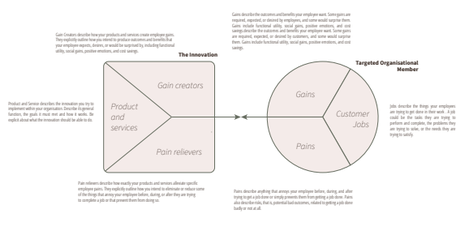


Figure 6.3: The Innovation Culture Readiness test

How to check for Absorption Capacity

As it is important for targeted members of an organisation to learn how to use the innovation, it is crucial for the implementation team to verify whether the employees have actually understood the task they were meant to carry out. Therefore, we propose the use of two 'Cards' to assess if the employees have acquired the correct knowledge to use the innovation effectively (see figure 6.5). These cards can be used to systematically document what the employees have learned and to explicitly outline the resulting decisions and actions. The implementation team can accomplish this by completing the 'Test Card' beforehand to clearly articulate their expectations for the employees' learning. This exercise should be conducted prior to the training and use of the innovation by the targeted members. The 'Learning Card' can be used by the implementation team after the employees have undergone the training to verify the correct implementation of the training. It will convert observations into valuable insights to help the team identify the decisions and actions necessary to ensure quality and consistency in the use of the innovation.

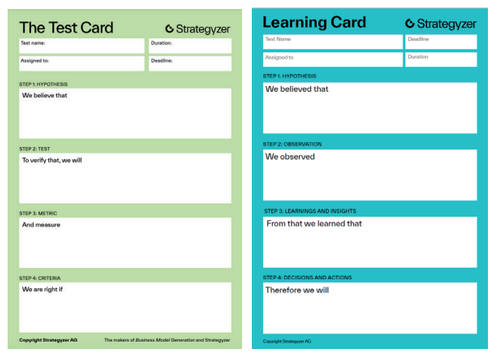


Figure 6.2 : The Test and Learning Cards

6.3 Artefacts that practitioners actually use

The handout

A handout is generally a piece of printed information provided free of charge, given to a person or organisation. This handout must provide sufficient information for the implementation teams to execute the different steps of the roadmap, as well as complete all the exercises individually. It should include a rationale to support the claims made, which can be based on the content of this thesis. It can contain links to videos or be composed of rational pages that describe the steps in more detail.

Seminar

A more proactive approach to publish the findings of this thesis could be achieved by organising a seminar. During the seminar, the content of this thesis can be further discussed by explaining the rationale behind each component. This will facilitate a more comprehensive sharing of information to clarify the various steps of the Quality Implementation Framework. An essential aspect of this seminar is to ensure that the implementation teams can immediately apply the content. Therefore, a brief session can be scheduled at the conclusion of the information sharing presentation, during which the participants can practise the different exercises. Following this session, they will be able to independently carry out the various steps.

Distribution and attendee selection

The handout's distribution channel, as well as the recruitment of attendees, should be conducted through a widely used medium by organisations and implementation teams. Therefore, it is recommended to utilise business-oriented social media channels, such as LinkedIn, to post content related to the handout or seminar. This platform serves our purposes by facilitating the distribution of the material and allowing for follow-up content to spread our message. Additionally, it enables attendees or individuals who find the content intriguing to share the information and reach a broader audience of potential interest.

This channel can also be used to distribute the Obstacle Board to a wider audience. First and foremost, the end justifies the means, which emphasises the importance of sharing the rationale for this artefact, as well as the tool itself. The Obstacle Board would require a more direct approach if it were to be implemented individually, as further development is needed to reach its full potential.

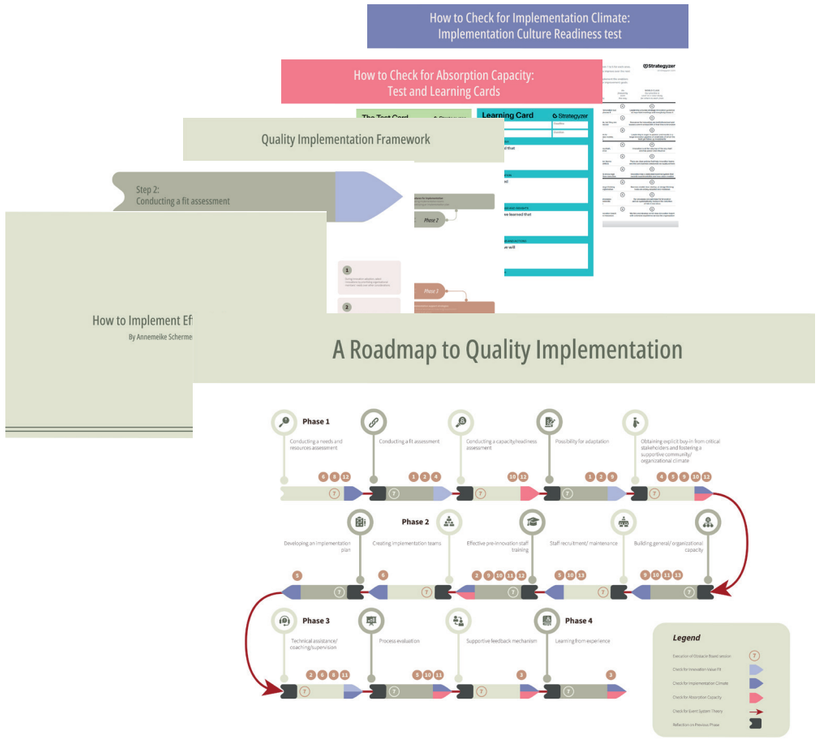


Figure 6.5: Several examples of the content for the seminar and handout

6.4 Concluding chapter 6

- Despite detailed research, there remains a gap between evidence and practice. Chapter 6 aims to suggest several ways to bridge this gap by transforming insights into a practical format for practitioners.
- Different approaches are required to effectively communicate findings to technology-focused and management-focused audiences. This ensures that practitioners can maximise the benefits of the artefacts, and researchers can expand and evaluate them.
- We combined the findings of this thesis in a combination of the content, so practitioners will be able to use the conclusions for improving their implementation endeavours. Mintjes (2023) suggests four elements for creating learning tools: entrepreneurial learning, knowing your audience, action-oriented tools, and reflection. The content should be concise, focusing on direct activities, exercises, and immediate objectives. A step-by-step approach is developed, in line with the Quality Implementation Framework.
- We described two artefacts: a handout and a seminar. The handout and seminar cover the content from this thesis, targeting practitioners to inform them on the important actions and steps to be taken including several tools which they can use during implementation projects. The section also discusses how to distribute these artefacts effectively.
- Several tools are proposed to assess Implementation Climate, Innovation-Value Fit, Absorption Capacity, and Event System Theory. They include the Implementation Culture Readiness tool, Value Proposition Canvas, and Test and Learning cards.

Project conclusions

07

7.1 To conclude

This study aimed to analyse how we can help organisations improve their effectiveness in implementing innovation. The main goal is to create two artefacts that not only enhance implementation practices but also educate implementation practitioners on how to execute these practices to elicit effective implementation. To further analyse this question, several research questions were formulated:

RQ: How can we support organisations to increase their innovation implementation effectiveness?

SQ1: *What is the process of implementation and what are the most important actions to improve implementation effectiveness?*

SQ1.1: *What do practitioners say about the process of implementation and issues that influence this process?*

SQ1.2: *How can we transform the process and issues from literature and practice into actions to achieve effective implementation?*

SQ2: *What does the field of implementation science suggest to practitioners on executing implementation?*

SQ2.1: *Can we identify patterns in the actions for effective implementation and how can these patterns improve the effectiveness of implementation?*

SQ2.2: *How does the literature propose approaching implementation effectively in practice?*

SQ2.3: *Why is this not working yet?*

SQ3: *Can we design a policy or practice that can help practitioners to improve implementation practices?*

SQ4: *Is it possible to create an artefact to educate practitioners to improve implementation effectiveness?*

This thesis explores the analysis of implementation practices and the challenges that lead to implementation failure in order to address the main research question. These practices and challenges are examined from various perspectives, as outlined in SQ1 and SQ2. SQ1 was addressed by considering SQ1.1 and SQ1.2, while SQ2 was addressed through SQ2.1, SQ2.2, and SQ2.3, which will be further discussed below.

SQ1.1: According to Rogers et al. (2003), the implementation process consists of five stages: Dissemination, Adoption, Implementation, Evaluation, and Institutionalisation. We conducted qualitative data analysis to enrich these stages with tasks and stakeholders, creating a comprehensive implementation model. Practitioners identified eight issues that arise during implementation and impede progress.

SQ1.2: Through the identification of the implementation process and its key components, we found challenges from existing literature and practical experiences. These elements and challenges were combined to identify thirteen actions that promote effective implementation. It is suggested that the accumulation of these actions enhances their impact; the more actions executed, the greater the effect.

SQ2.1: First, patterns in the thirteen actions from SQ1.2 were identified that explain why execution of these actions is important. We explored four complex theoretical constructs which explain why the different actions can lead to a certain innovation use and employee response, which contribute directly to the quality and consistency of innovation use.

SQ2.2: We continued with the investigation of prominent literature by reviewing a handbook that highlights important literature regarding practical approaches on how to implement effectively. From this review we selected the Quality Implementation Framework for further investigation. These studies strive to decrease the evidence-practice gap by offering scientifically grounded guidance for implementation.

SQ2.3: However, the high rates of implementation failure suggest that these practical approaches are ineffective. Our analysis revealed a gap that can be approached in two ways. Firstly, we found that the Quality Implementation Framework does not consider the identification of obstacles during project execution. Additionally, we discovered that these frameworks fail to reach the implementation teams, indicating a disconnect between the knowledge created and the knowledge used by practitioners.

After the analysis of the environment and knowledge base, as proposed in the Design Science Research Approach, the conclusion of these two sub questions lead to the design of two artefacts that help practitioners improve their implementation endeavours. These artefacts answer SQ3 and SQ4.

SQ3: To design an artefact that improves their implementation practices, we have developed a tool that improves the Quality Implementation Framework to help teams to continuously identify obstacles. This will help them identify significant events early on to be able to take a proactive approach and build organisational resilience.

SQ4: Not only the improvement of the Quality Implementation Framework was suggested as a conclusion from the analysis, but also the development of an artefact which includes the findings of this study and convert the content into a usable tool to educate practitioners on how to improve their implementation efforts. This resulted in the recommendation for active (a seminar) or passive (a handout) distributions of the findings to practitioners.

This thesis contributes to implementation science by providing a solution on how to educate practitioners on how to improve their implementation practices which builds on solving the evidence-practice gap. In the end, the artefacts designed in this study can contribute to improving the awareness of the different elements influencing implementation and how to tackle arising issues. This contributes to a higher success rate of implementation practices.

7.2 Future research

Implementation science has conducted numerous studies to address the evidence-practice gap. However, most of the research in this field has primarily centred around single case studies. As a result, our understanding of how different factors and practices interact and impact implementation effectiveness remains limited.

Furthermore, we propose investigating the thirteen actions that can potentially enhance effective implementation. It is hypothesised that these actions have a cumulative effect, but some have been mentioned in multiple sources while others may be less widely recognized issues. By executing further research on how these actions influence implementation, we can develop artefacts that can address each action individually so it becomes standard practice.

We also discussed four complex theoretical constructs that explain why different actions can lead to specific innovation use and employee responses, directly contributing to the quality and consistency of innovation use. Two constructs have already been hypothesised to influence specific employee responses, while Absorption Capacity and Event System Theory need further investigation to identify specific responses for each construct.

The creation of the combined content, including the seminar/handout, implies that the findings from this thesis are important for practitioners. By further developing this artefact, we can assist practitioners in improving their practices. However, this development must be carried out through co-creation with practitioners to ensure usability. In line with design approaches, it is also suggested to test this artefact for viability and feasibility with users to maximise its potential.

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Appendix

Appendix A: project brief

TU Delft

IDE Master Graduation Project

Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

STUDENT DATA & MASTER PROGRAMME
Complete all fields and indicate which master(s) you are in

Family name	Schermer
Initials	A.M.
Given name	Annemeike
Student number	4537009

IDE master(s) IPD ☐ DfI ☐ SPD ☑
2nd non-IDE master
Individual programme *(date of approval)*
Medisign ☐
HPM ☐

SUPERVISORY TEAM
Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

Chair	Ir. R.J.H.G. van Heur	dept./section	HCD
mentor	Prof. dr. ir. Smulders, F.E.H.M.	dept./section	DOS
2nd mentor			
client:			
city:		country:	
optional comments			

! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.

! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.

! 2nd mentor only applies when a client is involved.

APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

ir. R.J.H.G. van Heur — Digitaal ondertekend door ir. R.J.H.G. van Heur Datum: 2024.02.08 13:05:23 +01'00'

Name Ruud van Heur Date 8 feb 2024 Signature

CHECK ON STUDY PROGRESS
To be filled in **by SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total _____ EC

Of which, taking conditional requirements into account, can be part of the exam programme _____ EC

☐	**YES**	all 1st year master courses passed
☐	**NO**	missing 1st year courses

Comments:

Sign for approval (SSC E&SA)

Name _____ Date _____ Signature _____

APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be **checked and filled in by IDE's Board of Examiners**

Does the composition of the Supervisory Team comply with regulations?

YES	☐	Supervisory Team **approved**
NO	☐	Supervisory Team **not** approved

Comments:

Based on study progress, students is **...**

☐	**ALLOWED** to start the graduation project
☐	**NOT** allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Name _____ Date _____ Signature _____

DESIGN FOR our future

TU Delft

Personal Project Brief – IDE Master Graduation Project

Name student Annemeike Schermer **Student number** 4,537,009

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

Project title An in-depth examination of (in)effective implementation of innovations to bridge the valley of death

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

This thesis will become and exploration of an observed phenomenon I encountered during my internship at a Dutch health insurance company in the department of Strategy and business development. During this internship, the team was at the early stages of implementing the innovation funnel into their daily way of working. It was noticeable that daily activities were still progressing as normal, and it wasn't clear to everyone in the team what was expected of them regarding this innovation funnel. The innovation funnel itself has been tested many times before and has proven to be an effective tool for driving technological innovation (Dunphy, S. M., Herbig, P. R., & Howes, M. E., 1996), but still this organization struggled to gain full potential off its use. It makes you wonder why implementing innovations in an organisation is such a difficult task. The fields of implementation research and implementation science focusses on researching the phenomenon of implementation of innovations. These research groups have produced several frameworks but still in practice organisations still struggle and fail a lot. This thesis will focus on an in-dept examination of implementation of innovation to propose insights for research and practice into why implementation often fails and what to do about it.

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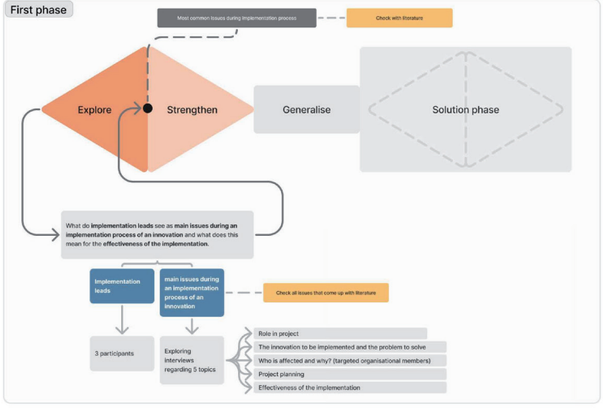


image / figure 1 First phase of graduation process and focus topics

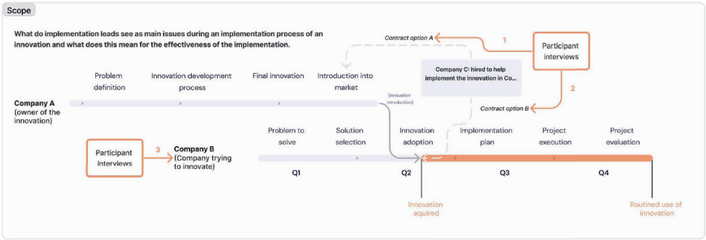


image / figure 2 Research scope (highlighted area). Further explained at the assignment section.

Personal Project Brief – IDE Master Graduation Project

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)

In order to thrive and being able to expand in the market, companies are obligated to innovate their practices, services and/or products (e.g.;Klein, Conn, & Sorra, 2001; Barrett, 1995; Jick, 1995; Slocum, McGill, & Lei, 1995). Those companies can decide on using an (bought and proven) innovation. This decision is defined the innovation adoption (Klein, K. J., & Knight, A. P., 2005). Research shows that e.g. 50% implementation of tech & administrative innovations fail (e.g., Aiman-Smith & Green, 2002; Baer & Frese, 2003; Repenning & Sterman, 2002) but there is still a lot to be discovered why these implementation processes fail. Klein, K. J., & Knight, A. P. (2005) argue 6 reasons on failure of implementation, but even though this knowledge is already out there, companies struggle with implementing this type of innovations effectively.

A paper by Sackett et al. (1996) introduces the evidence based practice in which he argues that using research findings and practices that are tested and validated should be used more widely. Still this is seen as quite the difficult endeavour as has been argued by Bulter (2008). He stated this difficulty as the 'Valley of death' in which he explained it as the phase between research and successful innovation. This phenomenon can also be translated to the field of implementation, where companies struggle with introducing a proven innovation within their company and implementing it successfully.

There are a few definitions that must be considered. The definition of innovation, which is a product or service that is (somewhat) new to its developers and/or its potential users (Kahn, K. B., 2018; Klein, K. J., & Sorra, J. S., 1996). Also, implementation, which has roughly similar definitions throughout the field but most conclude in "a specified set of activities designed to put into practice an activity or program" (Fixen, Naoom, Blase, Friedman, & Wallace, 2005, p. 6).

By bringing the two words together you will have the definition of innovation implementation which states: "Innovation implementation, ..., is "the transition period during which [individuals] ideally become increasingly skillful, consistent, and committed in their use of an innovation. Implementation is the critical gateway between the decision to adopt the innovation and the routine use of the innovation" (Klein, K. J., & Sorra, J. S., 1996; Klein, K. J., & Knight, A. P., 2005). Lastly, the effectiveness of an implementation can be defined by Klein, K. J. et al. (2005) as "the consistency and quality of which targeted organizational members' use of a specific innovation". The effectiveness of the implementation will be used to test if a company has failed or succeeded in executing their implementation plan.

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the ***green text format****:*

This research will be an exploration of the issues that arise during the implementation process through the eyes of implementation leads. Several different projects will be explored through interviews and their main components will be further investigated by in depth interviews. Literature research will be used to support the claims and generalise the findings.

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

This study will start with an interview phase to scope the project. Within this phase, different implementation leads who approach the process from different perspectives (see figure 1; Participant view 1,2 and 3) will be interviewed to find several issues during the implementation of a certain innovation within a company. These interviews will be focused on five topics (figure 1; five topics of interest (bottom). The company of focus will be one that uses an innovation (eg. A product/program/tech/service) to solve a certain problem (Figure 1; company B). The participants for the research are either be part of Company B (1), or part of company C, where they are hired by company A (owner of the innovation) or by company B (owner of the problem).

After the interviews, several issues from the implementation process will be checked with literature on accuracy. After this second phase, a focus will be chosen to strengthen the argument on what causes the main problems during the implementation process and what can be done about this. In depth interviews will be held with the same participants to get a better view on these problems and the underlying issues. These will result in in-depth insights, which can then turn into advices towards the field of implementation.

These in depth advices will be combined into three concepts to be implemented within the organisations. This thesis will be finalized with a proposal featuring three solutions implementation practice and to the field of implementation research on how to improve their way of implementation practices.

Project planning and key moments

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a ***kick-off meeting***, ***mid-term evaluation meeting***, ***green light meeting*** *and* ***graduation ceremony****. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting	8 jan 2024
Mid-term evaluation	23 mrt 2024
Green light meeting	29 apr 2024
Graduation ceremony	3 juni 2024

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.
(200 words max)

I have encountered a few moments in which I thought implementation and using innovation would have been easy but saw a lot of people strugling with actually doing just that. Therefor I am very interested in conducting a research in this field to explore the struggles companies have during an implementation project as I might aspire to work on tackling these difficult processes at my future job.

Appendix B: interview guide and data analysis

B.1: Interview guide

General Interview Guide V2

Objective: Discussing project dynamics and any significant changes since the start.

Project Initiation

Can you tell us how the project typically begins after it has started? Describe the initial steps taken and the tools created during this phase.

How do you ensure that the agreements made at the beginning of the project are still being followed?

Project Tracking Tools

Ask about the tools used for project tracking.

Request specific examples and insights into how these tools contribute to project management and oversight.

Changes Over Time

Have there been any changes in the project since it started? Can you reflect on the most significant changes and their impact on project dynamics?

Were these changes sudden or gradual?

How did the team react when these changes occurred?

How have you adapted to changing circumstances while maintaining project progress?

Unforeseen Events and Their Impact

Have there been any unexpected events that have affected the project?

Can you explain how you handled these unforeseen events and what their impact was on the project?

B.2: Rationale from qualitative data regarding the process of implementation

B.2.1 Implementation tasks

During implementation, several tasks are executed to transition from the adoption phase towards the evaluation and eventually routine use phase. Within an implementation project, the execution plan was often mentioned by practitioners as a leading guide towards success. Still, two other components were mentioned that greatly influence the success of the process; The development of the innovation to fit the organisation and the handover towards the business unit once the implementation phase is finished. The following paragraphs highlight the characteristics of the different tasks, as well as why they are important to the execution of implementation.

Implementation plan

Several practitioners mentioned the existence of some sort of planning for the execution of the implementation endeavours. The implementation plans involve different policies and practices from the organisation to help the project team with effectively implementing the innovation. These policies and practices involve project initiation activities and project execution activities to reach routine use of the innovation which are identified as separate tasks. During the project initiation, the project team needs to get to know the organisation, the innovation, and develop the tasks to implement in order to structure the project. The project leads highlighted that they need to focus more on getting to know either the organisation or the innovation, especially in the initiation phase, depending on their perspectives. During project execution, the project team manages the development of the user process and development of the innovation by testing and adjusting activities. The goal of the implementation plan is to structure the activities to execute implementation.

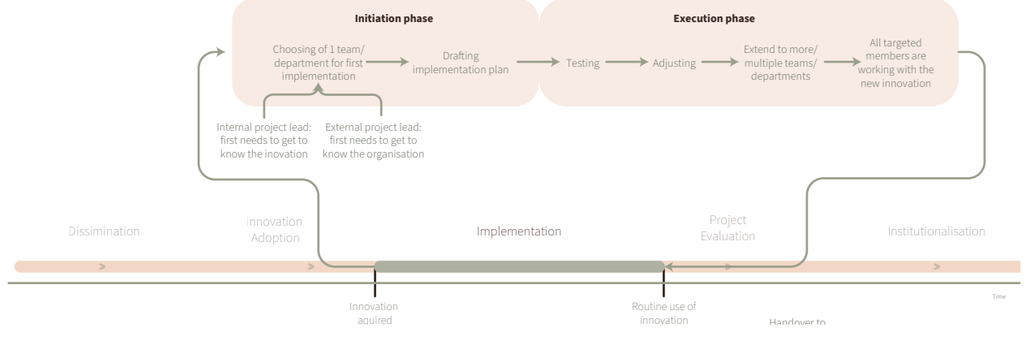


Figure B1: Schematic and simplified example of an implementation process

Development of the innovation to fit the organisation

The innovation, developed by an external party, is designed for general use and often has numerous features and possibilities that may not all align with the needs of the target organisation. During the process of adopting the innovation, the target organisation seeks to find the most suitable fit. Participant 2 described it as:

PARTICIPANT 2 - 00:10:49

The organisation had an administrative system that did not function well, so they were actually already looking for a new, more modern system to support the various processes ... So then they wrote out what they wanted, ... a request for proposal, and on the basis of that (the RfP) they just started looking at what systems were on offer in the market and they measured them against all their wishes and requirements. ... The RfP is a well-known term in that, and suppliers subscribed to that, so they signed up like, "ok, we want to participate, we want to sell you this product and yes, we can meet your wishes and requirements." ... But because they (the target organisation) generally don't know how the product really works, it (the RfP with requirements and wishes) is quite general and not very focused on the product they are trying to buy.

After adopting the innovation, the project team attempts to determine the remaining unidentified needs of the specific users within the organisation to force-fit the innovation. This can create challenges in deciding whether to prioritise the consistent and high-quality utilisation of the innovation or the needs and desires of the decision-making unit. The pilot participant highlighted it as:

PARTICIPANT 0 - 00:43:41

I thought it was important that the product is used well, that it works well and that it fits the need, that it solves problems. That stops at some point, because you don't sell that ... That's not what you get in return now and then at some point it's no longer interesting to invest in (by the organisation). So at some point I did really, and this is actually really stupid, really started to focus on that it was just deployed as often as possible. And then we started to learn from that, but the more often it's deployed, the more money we got in to just be able to show, this is worth it and then you have some space again. You know, then there's less pressure from above like, OK look, it can also be done financially, you know, we're going to get ahead with this. ... But I found that very unfortunate to notice, actually, that at least with us it was really about financial KPIS in the beginning. Even though those other things are much more important.

Handover

Once the implementation phase is complete, the project team is responsible for transferring their work to the business unit, which then supports the ongoing innovation as part of their day-to-day activities. At the end of the project, the organisation requests that the project team create a handover document that includes all important decisions and requirements. This highlights the need for a handover between teams and individuals. However, this can present challenges as the new stakeholders may have different perspectives, needs, or desires regarding the use of the innovation, potentially impacting the criteria for its use. As a result, the effectiveness of the implementation process may be affected, as previous decisions may need to be modified or may no longer be relevant.

Also, during a project, changing important stakeholders can create difficulties that jeopardise both the project team's activities and the overall effectiveness of the implementation. Some participants mentioned that they try to address this issue by involving certain employees in the implementation process who continue as support staff once the innovation becomes part of routine use. Participant three provided an example that illustrates the transition from pilot tests to nationwide implementation.

PARTICIPANT 3 - 00:28:58

We call that a pilot project ... there are a lot of people from the staff and from implementation who supervise and coordinate that and who arrange everything unconsciously and pull a lot of strings. Then they say, okay, fine, that's a success, we'll move on to national implementation and then we say okay, location XYZ good luck with it, we've tested it and it has been transferred (to operations) and the business case has been approved. Then we actually let it go and say, good luck with it. Then that location for that topic lacks the attention, that know-how that did get picked up or massaged away in that pilot location setting and where commitment was shown. There again you have to deal with people who say, yes, what are you doing shoving it down my throat? ... so there too, you have to continue to pay attention to the change process and if you let go of that, there will always be currents that do not produce the result that you managed to achieve in that pilot situation.

The project leads have highlighted multiple reasons for project handover. The ideal situation is when a project is complete and ready for handover, indicating that the innovation is in routine use. In practice, this accounts for approximately 90% of the finished implementation tasks. Since projects are costly, the organisation is confident in its ability to complete the remaining 10% on its own. However, the more activities that are left for the organisation to finish (specifically, the business unit responsible for continuing the innovation), the higher the chances of implementing it ineffectively, and even the possibility of the entire project failing. The company never admits to this, but instead, may put the project on hold or prioritise project criteria that do not involve the innovation in order to make the project appear successful. As a result, the actual number of project failures may be influenced in comparison to the reported number of project failures.

PARTICIPANT 2 - 00:33:52

Yes, and actually at the end the director wants to say, well, we had a successful implementation. It was a 7 or it was an 8. They're never going to call it a 10, because nobody believes that anyway, and it shouldn't be a 6 minus, so they'll always make sure they can justify it by scoring a 7 or a 7.5. Everyone is happy, so it's been a successful project. But yes, you see what changes, so actually, that Request for Proposal (project specifications) that was vague. Those specifications that are vague, like we want to improve efficiency, no matter what has changed in such a project, those can always be explained.

To conclude:

During the implementation process, success depends on three critical components: the implementation plan, development of the innovation to fit the organisation, and the handover to the business unit. An implementation plan serves as a planning, guiding the project team through initiation and execution activities necessary towards routine use. The development of the innovation involves aligning its features with the organisation's specific needs, often requiring adjustments to prioritise its consistent utilisation. Additionally, the handover phase transitions project responsibilities to the business unit, ensuring ongoing support and integration into daily operations. Challenges arise during handover due to new perspectives on innovation use and stakeholder changes, impacting the project's effectiveness. Participant insights highlights the importance of thorough planning, adaptation, and seamless transitions to achieve successful implementation.

B.2.2 Stakeholders

As described in section B.2.1, different stakeholders are involved during an implementation process. It is important to analyse which stakeholders play an important part in the process to further investigate the different roles and interdependencies. From the interviews we identified four main stakeholders; Decision. They all have different impacts on and responsibilities during the process of implementation. All stakeholders have different characteristics, responsibilities and knowledge on both the organisation and innovation. All identified stakeholders are explained in detail below.

The organisation's decision-making unit

The first category identified in the data is the decision-making unit of the organisation. This unit is responsible for the organisation's continuation and well-being. Organisations strive to stabilise their activities in order to operate as effectively as possible. Norms and routines within organisations contribute to maintaining the current situation and day-to-day activities (Klein & Sorra, 1996). Higher levels within the organisation play a crucial role in growing the organisation and establishing these norms and routines. They are responsible for creating a company strategy and handling issues related to the continuity of operations. According to one of the project leads, decisions to adopt innovations are often made at this level within the organisation. He described it as the organisation's top-down approach, where this unit can make decisions that can suddenly change the project scope at any time during the project.

Organisations often develop a strategic plan to promote growth. This strategy is formulated by the decision-making unit, making them responsible for all projects executed to achieve the strategic goals. Innovations are often used to reach these goals, making this unit highly accountable for the success of these innovations in meeting the strategic goals. Participant 2 emphasised that when an innovation is adopted and an implementation process is initiated, implementing the innovation is not the sole task of the project team. There are always additional needs from the organisation's strategic perspective or other projects that can impact the effectiveness of the implementation.

PARTICIPANT 2 – 00:29:34

Of course, you also receive a number of goals in a project. Like, it (the operations) should become more efficient or we actually need to save more money there or the quality (of a unit of operations) needs to improve.

Targeted organisational members

We have already defined targeted organisational members as individuals who are expected to either directly use the innovation or adjust their day-to-day activities and working processes to incorporate the 'new' innovation on a regular basis. Familiarising themselves with this 'new' innovation impacts the efficiency of the employees. These employees have a certain attitude towards the innovation, which can be either positive or negative, and this attitude influences the approach of the project team. According to participant 2, it is important for the targeted organisational members that the innovation aligns with their work and processes, but guidance from the old to new situation is crucial as they are accustomed to a certain way of working and need to make adjustments for which they are not yet equipped.

PARTICIPANT 2 - 00:16:22

On one hand, it's about making people or colleagues aware that we have this. There's also a little bit of internal marketing attached to it. And also that once people have submitted something then really do guide them. Well, how do you go through the funnel (the innovation)? What steps do you have to go through? Because almost all of my colleagues are just consultants and engineers who just work on problems with clients, but an innovation process, why all of a sudden it has to be about pains & gains, about value mapping and about business model canvas and things like that, that's all new.

Project team

The project team is responsible for ensuring a smooth transition from the old situation to the new one. Each team member has specific tasks based on their role. Collectively, they are responsible for informing and supporting all stakeholders throughout the change process, helping them to work with, accept, and manage the new innovation. Their tasks begin after being appointed by the decision-making unit after adoption, and conclude after handing over the project. They must constantly switch their attention between stakeholders, the innovation, and the process, making decisions based on their previous project experiences. The project lead is responsible for deciding which stakeholder needs to implement and which ones to disregard. Participant 1 provided the example of standardisation versus personalisation.

PARTICIPANT 1 - 00:36:43

Autonomy and standardisation means that you as a person (the employee) can no longer choose for yourself. And so I try to think along. That doesn't always work out ... He (the director) started to compromise a little bit, so he said, "Yeah, well, can't you support them in the way they really shouldn't be working?" ... Yes, of course you can, but so then I'm going to set up two processes or set up 3 processes or set up 4 processes, and all that's possible, but that does create risks ... And that's where it's obviously going to backfire ... That, of course, has become a thing. We did eventually manage to support this, as best we could, with a lot of inefficiencies. So in my view, one of the goals they had set for themselves "We want to move toward uniformity, standardisation," which was part of the project plan, therefore not met. But that was actually done during the project by the director himself.

Support team

As the innovation is delivered by an external party, it needs to be adjusted to fit the target organisation. Both the process and features of the innovation need to be evaluated to meet the needs of the targeted members. The support of the innovation from organisational members is crucial, as they are expected to use it. An essential component for efficient implementation is a support team that focuses on ensuring the functionalities of the innovation work well. This support team should remain involved with the innovation even after the project is completed, in order to sustain it over time and support its routine use. Therefore, involvement during the implementation and collaboration with the project team is key to success, making these employees part of both the project team and the targeted organisational members.

Additionally, there is a need for supporting staff in relation to the process. These employees often have experience with the innovation or are trusted advocates among the targeted users, and they play a significant role in the success of implementation. Within the organisation of participant 2, these employees are referred to as sprintmasters.

PARTICIPANT 2 - 00:53:28

What helps are those Sprint Masters, who have all gone through such a process before, and who can therefore motivate such a team a bit more.

Participant 4 emphasised the significance of receiving support from higher levels within an organisation. This support can take the form of assistance in making specific decisions, as well as highlighting the project's importance. In every organisation, it is crucial to have a supportive foundation and a shared understanding that implementing innovation is essential for the company's continuity and growth.

PARTICIPANT 4 - 01:14:53

With any change, you need a sponsor. That sounds very stupid, but you need someone higher up in the tree who is behind this (the innovation) and who just kicks against sacred structures for you. Like, hey, here's what we're doing, and that's who you need to help. It is often easier if there is an internal (employee) that does so.

In conclusion

The examination of stakeholders in the implementation process reveals four key actors: the decision-making unit, targeted organisational members, the project team, and the support team. The decision-making unit, which exists of higher-level executives, holds significant responsibility for the organisation's strategic direction and the adoption of innovations. Targeted organisational members, who need to integrate the innovation into their daily routines, require guidance and support to transition effectively. The project team facilitates this transition, balancing stakeholder needs and project requirements, while the support team ensures the innovation's functionality meets organisational requirements. Collaboration among these stakeholders, guided by their distinct roles and responsibilities, is essential for successful implementation. Participant insights show the importance of clear communication, support structures, and alignment with organisational objectives throughout the process.

B.2.3 Case specific knowledge

Unfamiliarity with either the innovation or organisation

During the data analysis, it was observed that an internal employee who is already contracted by the focus company is familiar with the organisational politics and work environment. However, as the innovation is new to the organisation, it is likely that this project lead has not previously worked with or been involved in the implementation of this innovation. Therefore, after the innovation is adopted, the project lead needs to become acquainted with the features and possibilities of the innovation.

The other option for the organisation is to hire an external project lead. The data indicates that this employee is hired for their expertise in either implementation processes or their previous experience in implementing the innovation at other companies. This gives the project lead the ability to anticipate and address difficulties that may arise during the implementation of the innovation. However, since every external consultant and organisation is different, they need to focus more on managing organisational politics and familiarising themselves with the organisation before being able to effectively start the project. As Participant 3 stated:

PARTICIPANT 3 - 00:03:13

The difficulty of this situation, when it comes to organisation x, is that this is my seventh week I think. So I took over from someone else and started at the beginning of December, so I'm still very much getting to know organisation x myself, getting to know the team. Soaking up all the history, from before.

Experience from previous projects

In the interviews, the participants elaborated on various project components and provided their rationale for their actions during the project. Drawing from their past project experiences, the project leads can make informed decisions on the most suitable approach to address issues. While their previous experience helps in determining the best course of action, it may not always be the optimal choice.

PARTICIPANT 3 - 00:10:53

Well, experience does teach you a bit, right? If something happens from previous projects, then you know how we dealt with it last time. Maybe that could help in this situation too.

In conclusion

The analysis reveals two primary approaches to project leadership in the context of innovation implementation: internal and external hires. Internal employees, already familiar with organisational dynamics, may lack experience with the new innovation. Conversely, external hires bring expertise from previous projects but require time to acclimate to the organisation's culture and processes. The project leads underscore the importance of balancing these factors. While past experiences inform decision-making, each project presents unique challenges, and relying solely on historical approaches may not always be optimal.

B.3: Rationale from qualitative data regarding the issues that arise during implementation

B.3.1 Non-user-centred (targeted organisational member-centric) approach while selecting the innovation during innovation adoption

Internal or external push for innovation is primarily recognized by higher-level employees within the organisation, as it is their responsibility to ensure market fit and organisational progress. This decision-making unit focuses on business development and strategic direction, and are also accountable for the adoption of innovation. While they make decisions on innovation from an organisational perspective, they often overlook the involvement of end users and the individuals who is responsible for supporting the innovation and the targeted members. As a result, it frequently happens that the innovation does not align with operational activities and processes, which hinders its effective use. Participant 4 shared an anecdote about this issue:

PARTICIPANT 4 - 00:02:53

So we thought on the front end: we spent 2 times, 3 months with 5 different cars with different drivers and tested them at two locations. We chose the best car and we're just going to order it for the rest and good luck with it. And then a year later with some introductions and occasional loading ramps etc and you find out that in the corridors the drivers at another location did have different opinions than the other drivers we tested with and then you get cowboy stories. "Yes, but surely testing was done at another business unit and not ours!"

B.3.2 Non-user-centred (targeted members) development of features and processes during testing and implementation phase

Once the innovation is adopted, the implementation phase commences. During this phase, the innovation is adjusted to fit the processes and work activities of the target organisational members. It is important to focus on the varying needs of different groups within the organisation that uses the innovation differently and tailor the features of the innovation to these needs. An important aspect of this is that the project team needs to make decisions regarding personalisation and standardisation, keeping the effective implementation in mind.

Participant 4 highlighted the importance of employee participation throughout the entire process. In an ideal situation, the targeted organisational members are involved in the innovation adoption phase to express their needs and desires regarding the innovation. Close contact during implementation is also important, as the features of the innovation and the work processes of the targeted organisational members can be adjusted to reach the full potential of the innovation. He highlighted that by not doing this, implementation effectiveness decreases.

PARTICIPANT 4 - 00:57:50

In higher levels, it can all be beautifully thought through in the Office, but it doesn't have to work like that outside ... Because we all think, you buy a car and everybody likes it, but sitting in the car for 6, 7 hours is something else, so that did open my eyes a little bit. ... I think ..., they really do have reason to just be critical from time to time, but it shouldn't get out of hand either.

B.3.3 Handover to the business-unit or new project members often fails

There are several factors that can lead to the failure of an implementation process. The successful completion of an implementation process only occurs when the responsibility for maintaining the innovation is transferred to a business/ operational unit. This allows the team to provide ongoing support and ensures that the use of the innovation becomes routine and integrated into the organisation. If the innovation is not properly handed over, there is a high likelihood that consistency and quality declines over time. Breaking this process into smaller parts, as Participant 3 suggested, can be helpful.

PARTICIPANT 3 - 00:26:37

Yes and then our job is done at some point and that is transferred to the business and then you make sure that transfer goes well. Just like the previous phase to this phase (it's important to) include people in it so don't say: well, we're done, tie it up, dear business, there you go and good luck. Because it's actually that you're going to take them with you beforehand in what you're doing to transfer nasty things, so not transfer everything bigbang, but you're actually going to take them with you per part actually.

B.3.4 The decision-making unit fails to prioritise the correct use of the innovation by targeted organisational members as it is not a part of their personal evaluation (eg. KPIs)

To achieve organisational success, it is crucial to have support for the new innovation at every level of the hierarchy. When the intended users are not supportive of the innovation, senior members of the organisation can explain its significance for the continuity and growth of the organisation. They can also address any concerns or issues from resistant employees. Top-level executives can demonstrate their support and interest in the innovation by taking on Key Performance Indicators that measure the quality and consistent use of the innovation by targeted members of the organisation. As participant 2 stated:

PARTICIPANT 2 - 00:28:21

... every business director has also been given the assignment, and that's also in his assessment and is assessed by our CEO, whether the innovation is being used enough ... there is even a matrix of KPIs that you have to meet. And, that ensures ... that it's becoming more and more commonplace.

B.3.5 Unclear and uninvolved product and process support

The innovation is new for both users and the organisation. People need to adjust their work habits and become familiar with a 'new'. They require assistance throughout the transition from the old way of doing things to the new way. Furthermore, it is crucial to provide ongoing support during the use of the innovation. If something doesn't work properly, people can become frustrated or even resistant, which may lead to a negative attitude towards the innovation. This can be avoided with proper assistance. It is important to involve people at different levels of the organisation, such as sprintmasters, champions, sponsors, and accountable executives. Participant 3 emphasised:

PARTICIPANT 3 - 00:27:30

Especially the first phase, of course, the development, that was technical, so we also have somebody from engineering who is still on the team. But also for the application, because that is being developed sector-wide, we still have people who have been involved in these phases. You can fall back on them for questions or what's the situation, because they have some historical knowledge.

B.3.6 The implementation of multiple parallel innovations (either with the same goal or different goals) can cause difficulties due to opposing/competing sub-goals

As the decision-making unit frequently adopts the innovation as a strategic approach for business growth, there are often concurrent projects that support the same or other strategic goals. These projects typically have their own project team and requirements, which can contradict or impede the innovation project. It is crucial for the project team to maintain close contact with the project team members of these other projects to align communications and implementation practices.

PARTICIPANT 3 - 00:17:22

There are six subprojects and we are one of them. In the end it does all have to add up to that common goal and then you can get in each other's way, but you can also act together. In the second half of this year, we are going to join forces with one of the other 5, because ultimately it has to land in the same new organisational unit.

B.3.7 Unexpected changes with a major impact

During an organisational project, various unforeseen issues can arise. For instance, there may be changes in the director, project owner, or team lead, alterations in investments, or internal or external pressures to modify project requirements. These issues can significantly impact a project and even lead to its immediate failure.

Success stories teach us that the team needs to conduct a fresh evaluation of the company and project specifications in order to adapt to the new collaboration and dynamics within the project, leading to success. This can be broadly categorised as “Unexpected changes with a major impact,” regardless of the nature of the change. Participant 1 provided an example to illustrate this issue:

PARTICIPANT 1 - 00:47:16

This director, who announced that she was leaving, by the way, after completion of the project. And also a key employee from the project. Then you have to deal with new people and those new people have a new way of looking at things again and then it becomes more difficult. Basically, you get a new project only they never call it that, because this director comes in and says, “Oh, I’ll join you and listen and I’ll follow you first.” And then he forms an opinion and he always has another one then the previous director, because every new director also wants to prove himself. Yes, really, I’m never disappointed in this opinion. It’s always the same thing when a new director comes in, right?

B.3.8 In projects, non-innovation-related requirements demand the implementation team’s attention due to a low quality planning and unclear project requirements

At the start of the adoption phase, the organisation collects the needs and desires from within the organisation that should be implemented during the project. These needs and desires are part of the project requirements and serves as the foundation of the project, containing the criteria on which the project is evaluated. However, these criteria are often vague (e.g. “We need to demonstrate efficiency”), lacking specific criteria to measure the team’s success in meeting the requirement. Some of these requirements may not even involve aspects that the innovation itself can fulfil, but the organisation expects that by using the innovation, these requirements are met (e.g. “We require fewer employees to accomplish the same amount of work”). The project team must consider these underlying requirements and the requirements related to the innovation itself, which increases the difficulty and likelihood of failure for an innovative project. Identifying these issues can lead to significant delays and impact the entire project. Participant 1 experienced this and described it as:

PARTICIPANT 1 - 00:26:39

That was not told to us. I didn’t get clear instructions beforehand or clear guidance from the director that I could test if it worked. I found that out as I went along, so I went back to that director and I said, well, we have a challenge, because at those locations it’s not working as you said at the beginning. Now what?

In conclusion

In examining the implementation process and stakeholder involvement, we identified key issues that can impact effectiveness. These issues range from non-user-centred approaches in selecting and developing innovations to challenges in handover processes and prioritising innovation use by top-level executives. Clear communication and alignment between projects are essential to address unexpected changes and competing goals. Additionally, inadequate planning and unclear project requirements often divert attention from innovation-related tasks. Participant anecdotes underscore the importance of user involvement, ongoing support, and adaptability in navigating these challenges.

B.4: Patterns identified in the data to explain 13 actions

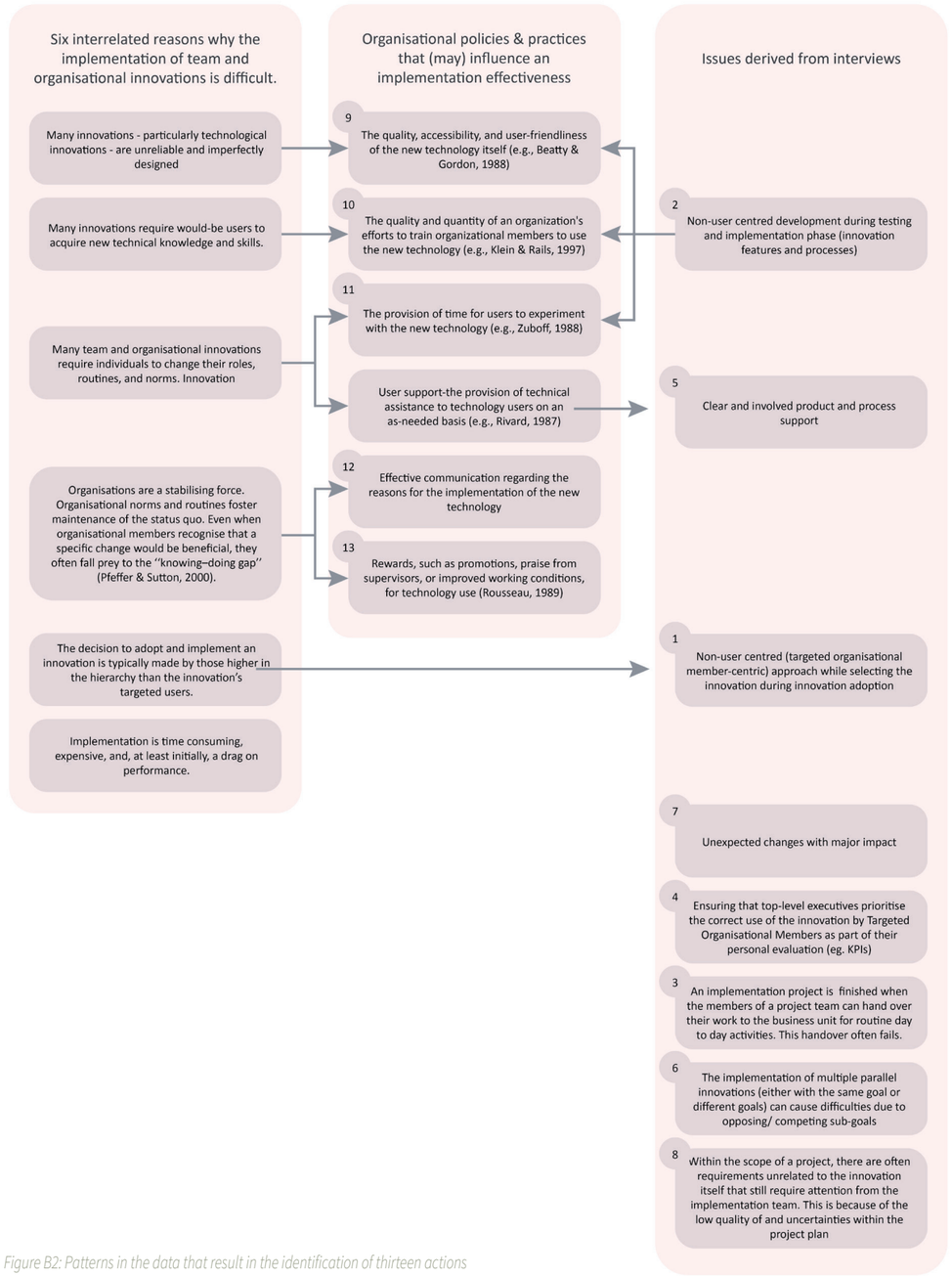


Figure B2: Patterns in the data that result in the identification of thirteen actions

Appendix C: Quality Implementation Framework and its associating questions

Phases and steps of the quality implementation framework	Frequency
Phase one: Initial considerations regarding the host setting	
Assessment strategies	
1. Conducting a needs and resources assessment:	14 (56 %)
Why are we doing this?	
What problems or conditions will the innovation address (i.e., the need for the innovation)?	
What part(s) of the organization and who in the organization will benefit from improvement efforts?	
2. Conducting a fit assessment:	14 (56 %)
Does the innovation fit the setting?	
How well does the innovation match the:	
Identified needs of the organization/community?	
Organization's mission, priorities, values, and strategy for growth?	
Cultural preferences of groups/consumers who participate in activities/services provided by the organization/community?	
3. Conducting a capacity/readiness assessment:	11 (44 %)
Are we ready for this?	
To what degree does the organization/community have the will and the means (i.e., adequate resources, skills and motivation) to implement the innovation?	
Is the organization/community ready for change?	
Decisions about adaptation	
4. Possibility for adaptation	19 (76 %)
Should the planned innovation be modified in any way to fit the host setting and target group?	
What feedback can the host staff offer regarding how the proposed innovation needs to be changed to make it successful in a new setting and for its intended audience?	
How will changes to the innovation be documented and monitored during implementation?	
Capacity Building Strategies (may be optional depending on the results of previous elements)	
5. Obtaining explicit buy-in from critical stakeholders and fostering a supportive community/organizational climate:	23 (92 %)
Do we have genuine and explicit buy-in for this innovation from:	
Leadership with decision-making power in the organization/community?	
From front-line staff who will deliver the innovation?	
The local community (if applicable)?	
Have we effectively dealt with important concerns, questions, or resistance to this innovation? What possible barriers to implementation need to be lessened or removed?	
Can we identify and recruit an innovation champion(s)?	
Are there one or more individuals who can inspire and lead others to implement the innovation and its associated practices?	
How can the organization/community assist the champion in the effort to foster and maintain buy-in for change?	
Note. Fostering a supportive climate is also important after implementation begins and can be maintained or enhanced through such strategies as organizational policies favoring the innovation and providing incentives for use and disincentives for non-use of the innovation	
6. Building general/organizational capacity:	15 (60 %)
What infrastructure, skills, and motivation of the organization/community need enhancement in order to ensure the innovation will be implemented with quality?	
Of note is that this type of capacity does not directly assist with the implementation of the innovation, but instead enables the organization to function better in a number of its activities (e.g., improved communication within the organization and/or with other agencies; enhanced partnerships and linkages with other agencies and/or community stakeholders).	
7. Staff recruitment/maintenance:	13 (52 %)
Who will implement the innovation?	
Initially, those recruited do not necessarily need to have knowledge or expertise related to use of the innovation; however, they will ultimately need to build their capacity to use the innovation through training and on-going support	
Who will support the practitioners who implement the innovation?	
These individuals need expertise related to (a) the innovation, (b) its use, (c) implementation science, and (d) process evaluation so they can support the implementation effort effectively	
Might roles of some existing staff need realignment to ensure that adequate person-power is put towards implementation?	

Figure B.3: Quality Implementation Framework including the probing questions (1)

Phases and steps of the quality implementation framework	Frequency
8. Effective pre-innovation staff training	22 (88 %)
Can we provide sufficient training to teach the why, what, when, where, and how regarding the intended innovation?	
How can we ensure that the training covers the theory, philosophy, values of the innovation, and the skill-based competencies needed for practitioners to achieve self-efficacy, proficiency, and correct application of the innovation?	
Phase two: Creating a structure for implementation	
Structural features for implementation	
9. Creating implementation teams:	17 (68 %)
Who will have organizational responsibility for implementation?	
Can we develop a support team of qualified staff to work with front-line workers who are delivering the innovation?	
Can we specify the roles, processes, and responsibilities of these team members?	
10. Developing an implementation plan:	13 (52 %)
Can we create a clear plan that includes specific tasks and timelines to enhance accountability during implementation?	
What challenges to effective implementation can we foresee that we can address proactively?	
Phase three: Ongoing structure once implementation begins	
Ongoing implementation support strategies	
11. Technical assistance/coaching/supervision:	20 (80 %)
Can we provide the necessary technical assistance to help the organization/community and practitioners deal with the inevitable practical problems that will develop once the innovation begins?	
These problems might involve a need for further training and practice in administering more challenging parts of the innovation, resolving administrative or scheduling conflicts that arise, acquiring more support or resources, or making some required changes in the application of the innovation	
12. Process evaluation	24 (96 %)
Do we have a plan to evaluate the relative strengths and limitations in the innovation's implementation as it unfolds over time?	
Data are needed on how well different aspects of the innovation are being conducted as well as the performance of different individuals implementing the innovation	
13. Supportive feedback mechanism	18 (72 %)
Is there an effective process through which key findings from process data related to implementation are communicated, discussed, and acted upon?	
How will process data on implementation be shared with all those involved in the innovation (e.g., stakeholders, administrators, implementation support staff, and front-line practitioners)?	
This feedback should be offered in the spirit of providing opportunities for further personal learning and skill development and organizational growth that leads to quality improvement in implementation	
Phase four: Improving future applications	
14. Learning from experience	7 (28 %)
What lessons have been learned about implementing this innovation that we can share with others who have an interest in its use?	
Researchers and innovation developers can learn how to improve future implementation efforts if they critically reflect on their experiences and create genuine collaborative relationships with those in the host setting	
Collaborative relationships appreciate the perspectives and insights of those in the host setting and create open avenues for constructive feedback from practitioners on such potentially important matters as: (a) the use, modification, or application of the innovation; and (b) factors that may have affected the quality of its implementation	

Figure B.4: Quality Implementation Framework including the probing questions (2)

Appendix D: session results

D.1: Method explanation for iCPS approach

Problem Finding phase

Flower association

The first technique used in this session is the flower association technique. This technique is used to explore the context of a problem by examining additional key elements in the problem statement (Heijne & van der Meer, 2019). It helps the resource group take a first step in moving away from the most "obvious" directions by identifying words they associate with. This technique is repeated for four key terms in the problem statement to find a clear alternative for the resource group.

Idea Gallery

To proceed to the Reverging stage of Problem Finding, the resource group was assigned to carry out the Idea Gallery technique. This technique aims to clarify, enhance, and validate the various ideas generated during the flower association exercise. The resource group is required to gather all the options generated from the Flower Association phase and then verbally present and discuss each option to reach a consensus on its interpretation.

Restating the problem

The objective of the Problem Finding phase is to restate the problem. The aim is to reach a consensus within the resource group regarding the problem at hand in order to proceed to the next phase: Idea Finding. This restatement is achieved by identifying the most suitable definitions from the four flower association tasks. The resource group reached a consensus on the most appropriate definitions, which led to a new problem statement.

Idea Finding phase

Superhero Round

The first step in generating ideas for the problem is the diverging stage. During this stage, it is essential to postpone judgement and prioritise quantity over quality. The goal is to come up with a large number of ideas by using the Superhero Technique. This technique involves asking the resource group to imagine themselves as specific (fictitious) characters and think about how these characters would solve the problem. The characters are predetermined to guide the resource group's thinking process.

Spontaneous Clustering

This phase continues during the reviewing stage by using the technique of Clustering. This technique helps the resource group identify patterns in the generated ideas. These patterns are identified within a cluster theme, which represents different groups of ideas. These groups are used to revise all the ideas and clarify them where needed.

Hits & Dots

The Hits & Dots technique is used to guide the resource group in selecting the most promising options for the problem. This technique helps groups select a small amount of ideas from a large quantity of data. The selected ideas represent the three concept ideas that would be further developed into artefact concepts and the missing piece to the puzzle to improve implementation effectiveness.

Solution Finding phase

5W & 1H

The 5W & 1H approach is a widely used checklist technique for analysing problems. It involves gathering facts and data to provide a comprehensive description of the problem statement. This technique is employed to find information about the context of implementation projects, establish a shared understanding of the problem, and identify underlying patterns. The specific problem to be addressed by this research group was: "Are there influences during an implementation project?" The resource group was tasked with answering questions beginning with 'Why', 'Who', 'What', 'When', 'Where', and 'How'. For instance, they are tasked to consider: "What influences an implementation project?"

Spontaneous Clustering

A similar technique was employed as used in session 2, to group the identified content. All questions from the 5W & 1H task resulted in an extensive overview of the problem space. The resource group was asked to identify patterns in the content which resulted in themes in the context space which could influence an implementation project.

Criteria & Ranking

To finalise the third session, the resource group was tasked to rank the different themes in order of importance. The theme with the most prominent influence on an implementation project at the top, going down to the theme with the least impact on such a project. This resulted in a ranking of themes to what project leads find important themes that influence implementation. These themes can be used to identify focus points during an implementation process on what subjects can elicit obstacles.

D.2: Restatement of the roblem

The first step into iCPS has been proposed to establish a common understanding of the issue that is addressed during the idea generation stage. This first phase contains three stages to recreate the problem together with the resource group. The initial problem, or Problem-as-Given (PaG) (Heijne & van der Meer, 2019), states: “How can an implementation team periodically identify (future) obstacles that can become critical within a project?”.

Describing associative terms

The Flower Association technique is used to explore the context of a problem by examining different alternatives of factors within the problem statement. For this task, the resource group was asked to execute this technique for three factors: Identification, Obstacles, and Periodical. This resulted in three ‘flowers’ containing associating words for the three factors. An example can be seen in figure 5.4 whereas the complete findings of this session can be found in Appendix D.1. This task resulted in 192 associative words to the three factors.

Idea Gallery

The Idea Gallery technique was applied to clarify, enhance and validate the various ideas generated during the flower association. The three factors from the original problem statement are evaluated and further clarified where needed.

Restating the problem

The final step of the Problem Finding phase was aimed to recreate the problem statement to find consensus on the meaning of the problem to be solved. Heijne & van der Meer (2019) defined this newly formed statement as the Problem-as-Perceived (PaP). The new problem statement as a conclusion of the first session states: “How can an implementation team continuously identify (future) problems (that can become critical) within a project?”. The phrases “future” and “that can become critical” have been left out of the final problem statement for simplification purposes to not over-complicate the problem, but they are still relevant for final description of the artefact.

D.3. First idea generation of the artefact to identify obstacles

The first creation of ideas to develop an artefact to solve the puzzle and complete the Quality Implementation framework, contains three techniques: Superhero Round, Spontaneous Clustering, and Hits & Dots. The problem used to generate ideas is concluded from phase 1, which states: “How can an implementation team continuously identify problems within a project?”. In this phase, the goal is to generate three concepts, where the resource group first creates a high amount of ideas, clusters the ideas and selects the three most promising options to fit the problem statement.

Superhero Round

The superhero round is a technique used to generate a high amount of ideas by tasking the resource group to impersonate a certain persona. Three persona’s for this task are selected: 1) a superhero, 2) the president and 3) your mother. For this task, we asked the resource group the following questions: “How would a … solve this problem?” where the persona’s are filled in at the dots. The resource group was then asked to answer the questions by putting down post-its with their answers. For this phase, the rule of “Quantity breeds quality” was deployed. Heijne & van der Meer (2019) state that ideas come in three waves, where the first wave of ideas are generally everyday and common ideas. The second wave are often unusual and silly ideas and the last wave offers novel and new ideas. The personas are chosen in the aforementioned order. The superhero persona sets the mood for a creative mindset, while personifying different presidents is used to develop silly ideas. The novel ideas are real and applicable, aligning with a persona, their mothers, that the resource group can actually relate to. This technique eventually resulted in 111 distinctive ideas with which we continued towards idea evaluation. Figure 5.6 highlights an example of the ideas generated during the Superhero Round.

Spontaneous Clustering

The resource group was asked to cluster the 111 ideas into corresponding groups in a spontaneous manner, by putting ideas of a similar nature together. The group was asked to name each cluster with a corresponding theme to highlight the subject of the group. This helps a group identify patterns. The group identified 8 distinctive patterns in the data.

Hits & Dots

To finalise this session, the resource group was tasked to select the three most promising options from the data. They are given four pink dot stickers and one blue dot sticker. The pink dots represented the most promising ideas for effectively solving the problem, while the blue sticker represented their preferred solution. The blue sticker represents original ideas, which addresses the paradox of creativity where unique and unconventional ideas are often rejected because they don’t align with the requirements as effectively as more conventional ideas. Therefore, a stimulation is used to not discard these out-of-the-box ideas. From the ideas with a sticker, they are asked to select three options that would represent the most promising solutions to the problem: “How can an implementation team continuously identify problems within a project?”

D.4. Three concepts

Concept 1: Questionnaire

The first concept involves the use of questionnaires as an approach to obstacle identification. By distributing questionnaires to relevant stakeholders, the project team can systematically gather insights and perspectives on potential obstacles that may arise during project implementation. These questionnaires not only serve as a means of obtaining input from diverse stakeholders, but also provide an organised way to capture important ideas that might otherwise be overlooked.

At (update) meetings, a questionnaire is sent to all involved stakeholders beforehand, containing questions about obstacles. This allows the stakeholders to utilise their own expertise and provide answers regarding any potential risks and/or obstacles they foresee in the future concerning the phase of the project at that moment.

Questionnairs

User

- This concept can be used for the team (e.g., team meetings)
- It is possible to choose to involve key stakeholders (e.g., during quarterly meetings with the management or gate checks)
- All stakeholders can also be involved (e.g., for every meeting

Frequency of use

- It is important to agree on the frequency of the questionnaires at the beginning of a project in order to maintain continuity
- Depending on the number of stakeholders involved, the frequency can be high or low

Options for use

- It can be agreed to fill out the questionnaire before a meeting so that the outcomes can potentially be discussed during the meeting
- A questionnaire can be sent after a meeting so that the discussed topics can be taken into account

Method

- The topics from the influence session can be used for the questions, but these can be adjusted according to what is currently happening in the project
- From the team, the questionnaire needs to be processed in order to identify the important insights. These can be discussed in a project team meeting

Figure D.1: The content of the Questionnairs concept

Concept 2: Introspecting

The second concept, introspecting, emphasises the importance of reflecting on past experiences, personal conversations, and tasks to inform the team about future obstacles in upcoming project phases. By engaging in discussions and analysis, the project team can leverage insights from previous project phases to better anticipate potential obstacles. The team is thereafter tasked to look into the future to foresee potential obstacles. This iterative approach to obstacle identification helps the team continuously improve, enabling them to refine their practices and strategies over time.

User

- For this concept, it can be identified in each meeting who is important for the next phase of the project and thus who should be involved
- The project team is always involved

Frequency of use

- The frequency for this concept is somewhat lower since the time and attention for identifying obstacles are higher

Options for use

- The meeting is typically scheduled after every major deadline or at the beginning of a project phase/new project component
- An additional meeting can be scheduled after significant changes in the project (e.g., objectives, scope, unexpected setbacks, etc.)

Method

- The project team dedicates an extended period (1 full meeting) to identify risks and obstacles of a project component, enabling forward-looking consideration of potential issues in the next phase of the project
- A passive or active approach can be chosen (see description)

Periodically, time is set aside for an obstacles meeting. This can be an active session in the form of a risk meeting (for example, after a deadline/gate in the process) or a passive meeting (for example, based on an email with questions that are then addressed in the next team meeting).

Introspecting

Figure D.2: The content of the Introspecting concept

Concept 3: Obstacle board

Lastly, the third concept involves the implementation of an obstacle board, which is a visual tool designed to facilitate real-time tracking and monitoring of identified obstacles. At the start of the project, the board is established with a predefined structure, typically featuring a vertical axis denoting different themes within the implementation project, ranked by the importance of obstacles, and a horizontal axis indicating the timing of their occurrence. Stakeholders are invited to share their input by writing obstacle cards and placing them on the board according to the most appropriate timing and theme. This interactive and dynamic approach to obstacle identification enhances transparency, collaboration, and accountability within the project team, enabling them to collectively address and overcome obstacles as they arise.

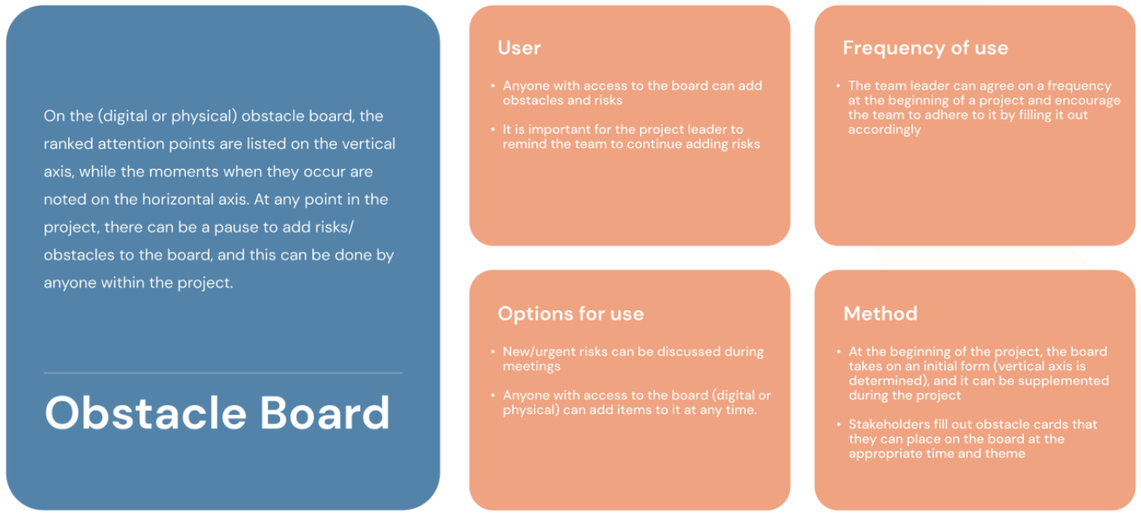


Figure D.3: The content of the Obstacle Board concept

D.5: Solution Finding Session

5W & 1H: What influences an implementation process

The first creative step of this session, aims to identify the factors that influence an implementation process. Different flipovers were handed to the resource group at which they were tasked to put post-it notes with factors that answer that specific question. An example of a question is" What influences an implementation process?". This resulted in 152 influences on implementation processes.

Clustering of the influences

The session continued with the reverging phase: Spontaneous Clustering. This phase was executed similarly as the clustering phase during the first session where the group was tasked to group similar factors together and give each cluster a corresponding name. The group identified 11 different groups. These groups represent the themes that can be used as triggering factors to help implementation teams identify obstacles. The integration of these themes into the concept is further elaborated on in section D.6.

Select Criteria & Rank the concepts

As a concluding task for the second session, the resource group was tasked with selecting one concept. This concept represents the format used to identify obstacles on a regular basis. To choose the best option, the team was first asked to identify objectives that the concept must adhere to. The objectives, along with their corresponding weight, can be found in figure 5.7. By totaling the scores for each concept, the result showed that the Obstacle Board was the best fitting solution.

	Weight	Questionnaire		Introspecting		Obstakelbord	
Toegankelijk voor stakeholders van project	1	3	3	2	2	3	6
Laagdrempelig	5	2	10	3	15	4	20
Eenvoudig te communiceren	5	5	25	2	10	5	25
Meervoudig uit te voeren in project stap	3	4	12	4	12	4	12
Zorgt voor weinig process uitvoering maar snelle inzichten	4	3	12	2	8	3	12
Er kan discussie zijn over belangrijke en onbelangrijke obstakels	3	4	12	5	15	5	15
Samen met het team uitvoerbaar	3	5	15	5	15	5	15
		Totaal: 93		Totaal: 77		Totaal: 105	

Figure D.4: the results of the Weighted Objectives Approach

D.6: Testing of concept 1 of Obstacle Board

Testing the first version of the obstacle board

During the session, the project lead's first question for the team was to identify the initial obstacles that came to mind. The team started by writing down several obstacles and then proceeded to discuss and examine them. They then shifted their focus towards future-oriented obstacles and current obstacles, alternating between the two. After doing so for the provided time, the team had identified 18 obstacles, with most obstacles in the current implementation phase (See Figure 5.9).

Within the second part of the session, the team became more familiar with the task and promptly delved into identifying obstacles for the upcoming implementation phase. Feedback was provided to the research group, emphasising the importance of being specific when documenting issues, rather than simply noting broad and ambiguous concerns. This approach led to a more comprehensive understanding of obstacles and tasks, as well as a productive discussion about any phases that had been overlooked or skipped previously. By the end of this session, the project lead was able to summarise the steps and allocate tasks to different team members, indicating which obstacles they should investigate further.

Feedback and further development

During the evaluation, a participant emphasised that this format makes it easy to prioritise tasks and check if previous tasks have been completed. By completing tasks before moving on to the next phase of the project, you can minimise risks in the future.

RESOURCE GROUP TEST 1 PARTICIPANT 4: 00:00:39

I think it also helps in prioritisation. When you talk about finishing tasks, you know exactly where you stand, because these are all things that are likely important. It is important to prioritise what needs to be tackled first, and you will likely see that many of these points still come from the previous period that you have not yet addressed. If many of these issues are mainly related to the previous project phase, that poses significant risks. We have actually discussed this extensively (in this session).

One of the participants noted that in many ways, some teams already employ this form of identification. However, transforming it into a team effort, with active participation from everyone (in a meeting format), simplifies the process of pinpointing obstacles that require input from two different roles. She emphasised that it is simple to view things from one's own perspective, but engaging in discussions about the impact of an obstacle facilitates further elaboration.

RESOURCE GROUP TEST 1 PARTICIPANT 1: 00:12:22

I believe that this also applies to a regular project. You only truly notice the similarities between what you are all doing when you discuss it with each other. This often brings risks with it, as everyone mainly focuses on their own tasks.

With this feedback, we can proceed with developing the concept for the final testing phase. This phase is conducted in a real-world environment, where the concept is adjusted to align with the organisation's needs.

D.7: Testing of concept 2 of Obstacle Board

Session results

During initiation for this session, the project lead and researcher conducted an introductions meeting in which the obstacle board was explained. The project lead suggested changing several phrases to fit the language of the organisation for recognition purposes. For example, the first column on the vertical axis was changed to 'Risks' as it would contain the risks the team had identified during previous analysis. Also, the project lead suggested to differ the colours of post-its used, as they would represent the action to be taken towards the obstacle (eg. a red post-it would require immediate action by one of the team members).

Once the session commenced, the first remark of the team was regarding several empty vertical rows. This represented that the team did not yet identify obstacles or risks regarding these themes (See Figure 5.10). This discussion followed with the remark of one of the team members, highlighting issues that had come up but weren't shared with the team. This resulted in a negative employee response, which can directly influence the implementation effectiveness.

RESOURCE GROUP TEST 2 PARTICIPANT 3: 00:11:07

Some employees have argued that the administrative tasks are very unclear. Maybe I need to tackle this problem, as I hear all the discussions and know who has problems with it. I noticed that more people are talking about the problem, but they have not directly addressed it to me or us.

As a result of this remark, the team decided to address this matter by taking immediate action. This particular team member would follow up with the employees to ask them about the comment and issue in order to find the root cause of the problem.

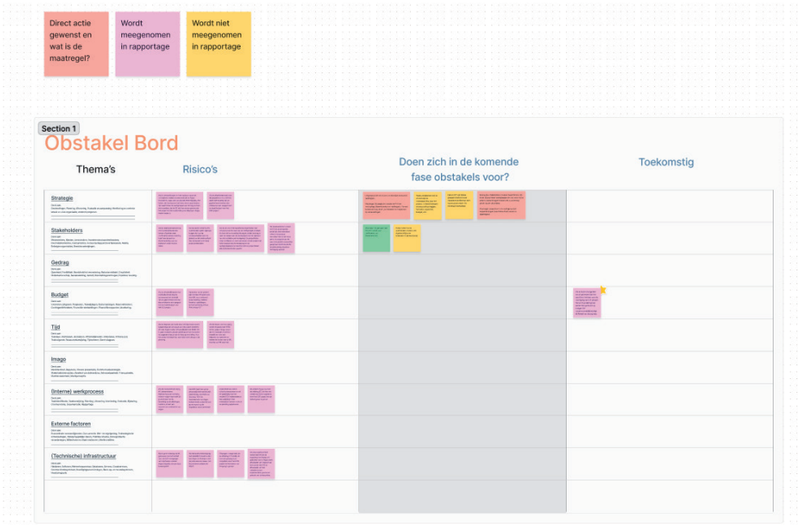


Figure D.5: the results of session 4

An observation revealed that the participants were unable to have open discussions due to the online approach of meeting. The project lead primarily conversed with one team member, while the others remained silent. This interrupted the flow of the meeting. Additionally, not all topics were covered as the conversation progressed slowly and stayed focused on a few themes for an extended period. This indicates the necessity of proposing measures to ensure fluency.

Feedback from session and survey

By the use of a questionnaire, the participants were able to provide feedback to several questions. The full results of this questionnaire can be found in Appendix F. The general response to the Obstacle Board to identify obstacles in an implementation project was positive. For “Usefulness” the tool scored a 6.5 out of 7 where 7 is defined as “Very-useful” and “effectiveness to identify and communicate potential obstacles” a 6 out of 7. The tool also improved the collaboration between the project team as a common understanding of the issues and risks were developed.

QUESTION FROM SURVEY:

“How has the obstacle board contributed to the awareness and understanding of the obstacles and risks within the project team?

ANSWER BY PARTICIPANT 2

“First of all, attention and structure. It turns out that we can and should have many more discussions than we thought. The board explicitly encourages you to identify risks. In addition, we seem to have our own view of the risks and obstacles, even though we thought we felt the same way. This tool provides an explicit moment and space to discuss matters thoroughly.”

In line with the observation of the researcher, the participants noticed time was limited. The meeting lasted 52 minutes, but still only a small amount of topics was covered. Participant 1 mentioned:

QUESTION FROM SURVEY:

“Would you recommend the obstacle board as a useful tool for future projects? Why or not?”

ANSWER BY PARTICIPANT 2

“Certainly. Though it is necessary to limit things regarding time. You can have a lot of discussion, but it is important to be explicit.”

Appendix E: handout test session: Financial Service Provider

Inhoud handout

1. Informatie over SecureFinance
2. Organogram organisatie
3. Functionaliteiten chatbot
4. Mogelijke interactie met chatbot (3x)
5. Fase onschrijving

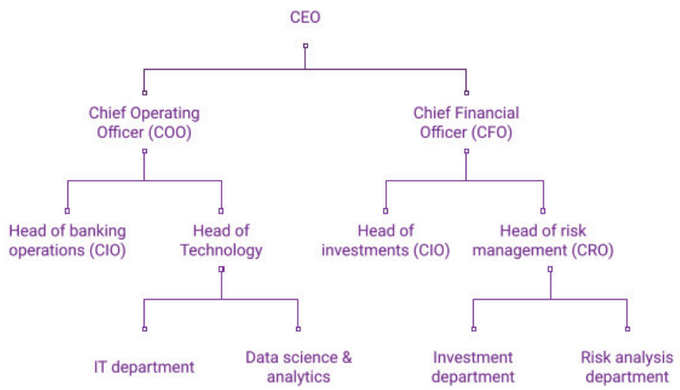
SecureFinance

SecureFinance is een financiële dienstverlener die zich richt op het leveren van veilige en betrouwbare online bank- en investeringsdiensten aan klanten in Nederland. Met een sterke focus op beveiliging, klanttevredenheid en innovatie streeft SecureFinance ernaar om een vertrouwde partner te zijn voor individuen en bedrijven die op zoek zijn naar hoogwaardige financiële oplossingen. Het bedrijf biedt een breed scala aan diensten, waaronder online bankieren, leningen, beleggingsadvies en vermogensbeheer, en streeft ernaar om klanten te voorzien van gepersonaliseerde oplossingen die voldoen aan hun financiële behoeften en doelen. Met een toegewijd team van professionals en een streven naar continue verbetering, is SecureFinance gericht op het leveren van uitstekende service en het bouwen van langdurige relaties met klanten, gebaseerd op vertrouwen, integriteit en transparantie.

SecureFinance is een financiële dienstverlener die gespecialiseerd is in het aanbieden van veilige online bank- en investeringsdiensten aan klanten in Nederland. Om de klantenservice te verbeteren en de efficiëntie te verhogen, heeft SecureFinance besloten om een AI-gestuurde klantenservicechatbot te implementeren.

Functionaliteiten chatbot

Organogram SecureFinance



Fase 1: Voorbereiding en planning

Fase 2: Ontwikkeling en integratie

Stap 1	Stap 2	Stap 3	Stap 4
SecureFinance ontwerpt een gebruiksvriendelijke interface voor de chatbot, die naadloos integreert met hun bestaande klantenservicesystemen.	AI-algoritmen worden ontwikkeld om de chatbot in staat te stellen vragen van klanten te begrijpen en nauwkeurige en relevante antwoorden te geven.	De chatbot wordt geïntegreerd met SecureFinance's CRM-software, kennisdatabase en ticketingsysteem, zodat het toegang heeft tot klantinformatie en efficiënt kan reageren op verzoeken.	**Uitgebreide tests worden uitgevoerd om de functionaliteit, nauwkeurigheid en gebruikerservaring van de chatbot te valideren en eventuele bugs op te lossen.**

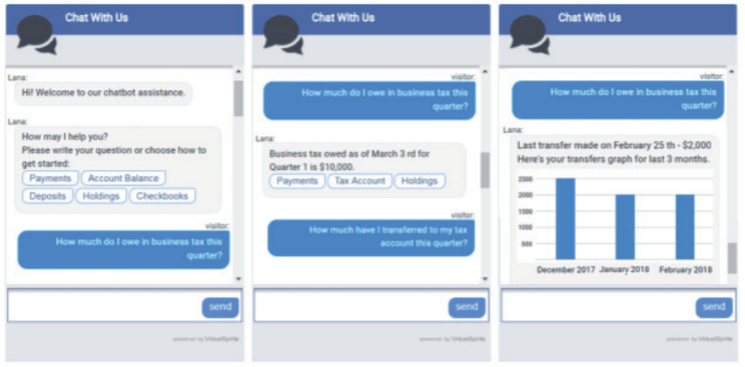
Fase 3: Uitrol en training

Stap 1	Stap 2	Stap 3	Stap 4
De chatbot wordt uitgerold naar klanten via verschillende kanalen, zoals de website, mobiele apps en sociale media.	**Klantenservicemedewerkers worden getraind in de functionaliteiten van de chatbot, gebruiksscenario's, escalatieprocedures en onderhouds- en updatesprocedures.**	SecureFinance biedt continue ondersteuning en training aan medewerkers om ervoor te zorgen dat ze comfortabel zijn met de chatbot en deze effectief kunnen gebruiken.	Monitoring van de prestaties van de chatbot wordt regelmatig uitgevoerd en feedback van klanten en medewerkers wordt verzameld om aanpassingen en optimalisaties door te voeren.

Chatbot functie 1:

Leadgeneratie Financiële Dienstverlening

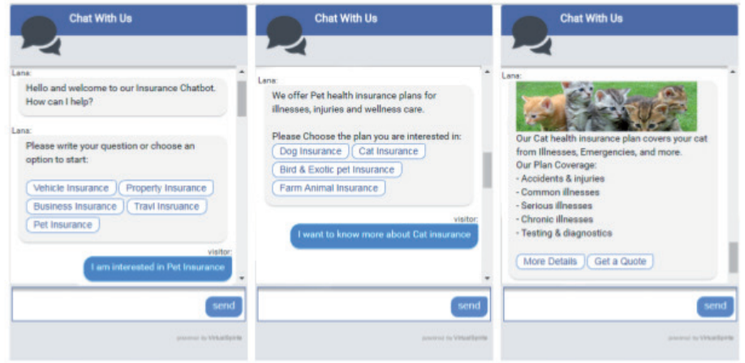
De Chatbot zorgt voor een hoger aantal registraties en helpt bij het werven van nieuwe klanten. Laat de online chatbot interacties verrichten met potentiële klanten. Vereenvoudig het koopproces door 24/7 vragen te beantwoorden, help bij dilemma's, terminologie, voordelen, polisvoorwaarden, gepersonaliseerde suggesties, kortingen, promoties en meer. Integreer de chatbot met uw CRM en stuur nieuwe verkoopleads rechtstreeks naar uw verkoopmedewerkers met belangrijke informatie over de wensen van de lead.



Chatbot functie 2:

Chatbot Selfservice Verzekering

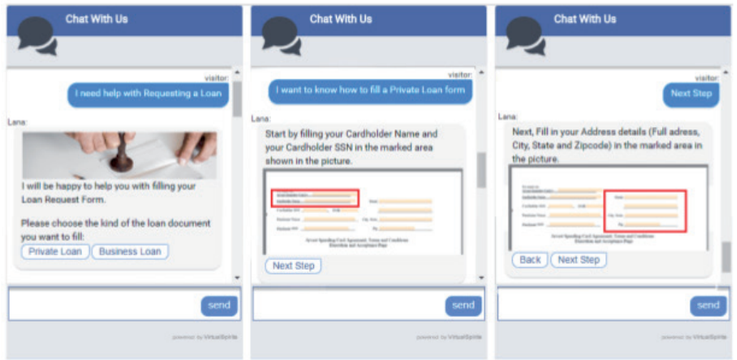
Laat uw klanten 24/7 met uw verzekeringskantoor cagentschap viaanaf hun desktop en mobiel. Gebruik de Chatbot om uw klanten te ondersteunen en direct antwoord te geven op vragen over nieuwe verzekeringen, vereenvoudiging van terminologie, indiening van claims, voorlichting van potentiële kopers, geldbeheer en meer. Het machinaal leren van de A.I Chatbot helpt het nieuwe vragen te leren uit gesprekken met echte klanten.



Chatbot functie 3:

Chatbot Klantenservice Bankieren

Chatbot klantenservice om klanten persoonlijke online assistentie te bieden. Bots zorgen voor een constante communicatie die tegemoet komt aan de uiteenlopende behoeften van klanten. Klanten krijgen 24/7 geautomatiseerde begeleiding voor geldbeheer, financieel advies, analyses, datavastlegging, nieuwe producten en diensten, geldoverboekingen en betalingen van nota's. Gebruik conversietracking, rapportage en chatinformatie om inzichten te verkrijgen en de prestaties van de chatbot te verbeteren.



Fase 2 stap 4 (testen & validatie)

In deze fase wordt de AI-gestuurde chatbot ontwikkeld voor het bestaande dienstverleningsplatform en geïntegreerd in het klantenservicesysteem, en wordt deze grondig getest om de nauwkeurigheid en effectiviteit ervan te waarborgen.

Activiteiten:

- Ontwikkeling van AI-algoritmen en natuurlijke taalverwerkingstechnologieën voor de chatbot.
- Integratie van de chatbot in het bestaande klantenservicesysteem en website.
- Uitvoeren van testscenario's en validatietests om de functionaliteit en gebruikerservaring te beoordelen.
- Verfijning van de chatbot op basis van feedback van gebruikerstests en simulaties.
- Trainen van medewerkers voor het gebruik van de chatbot en het bieden van ondersteuning aan klanten.

Fase 3 stap 2 (training van personeel)

In deze fase wordt het personeel getraind voor het gebruik van de AI-gestuurde klantenservicechatbot en het bieden van ondersteuning aan klanten.

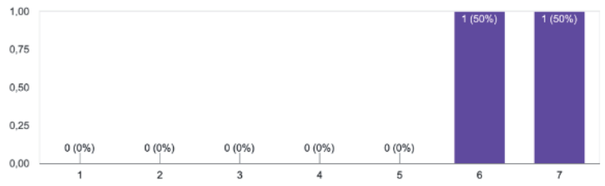
Activiteiten:

- Introductie van de chatbot: Personeel wordt bekend gemaakt met de functionaliteiten en mogelijkheden van de chatbot, inclusief hoe deze is geïntegreerd in het klantenservicesysteem.
- Trainingsessies: Medewerkers worden getraind in het gebruik van de chatbot, inclusief het starten van gesprekken, het interpreteren van klantvragen en het bieden van relevante antwoorden.
- Escalatieprocedures: Training wordt gegeven over wanneer en hoe klantvragen moeten worden geëscaleerd naar menselijke medewerkers indien nodig.
- Feedbackmechanismen: Medewerkers worden geïnstrueerd over hoe ze feedback van klanten kunnen verzamelen en hoe ze deze feedback kunnen gebruiken om de chatbot te verbeteren.
- Oefeningen en simulaties: Personeel neemt deel aan oefeningen en simulaties om hun vaardigheden met de chatbot te verbeteren en om te gaan met verschillende klantscenario's.
- Ondersteuning en follow-up: Na de training wordt doorlopende ondersteuning geboden aan medewerkers en vinden regelmatig follow-up sessies plaats om hun kennis en vaardigheden te onderhouden en verbeteren.

Appendix F: questionnaire results

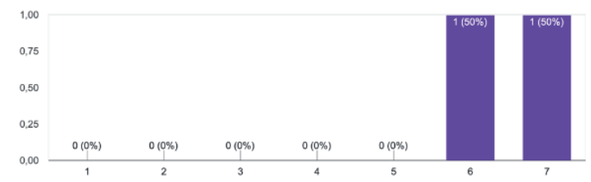
Heeft het obstakelbord geholpen bij het identificeren van potentiële oplossingen of mitigerende maatregelen voor de geïdentificeerde obstakels en risico's?

2 antwoorden



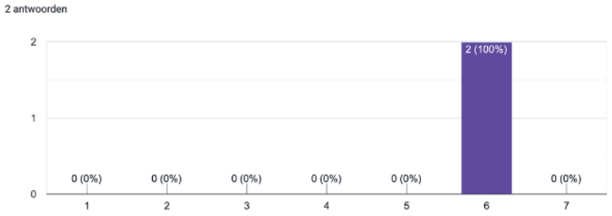
Op een schaal van 1 tot 7, hoe duidelijk vond je de formulering van de thema's op het obstakelbord? (verticale thema's)

2 antwoorden



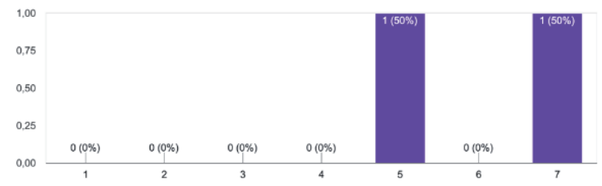
Hoe gemakkelijk vond je het om nieuwe obstakels of risico's toe te voegen aan het obstakelbord tijdens het testen?

2 antwoorden



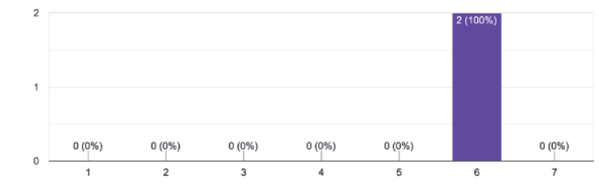
Hoe effectief vond je het obstakelbord bij het identificeren en communiceren van potentiële obstakels en risico's voor het project?

2 antwoorden



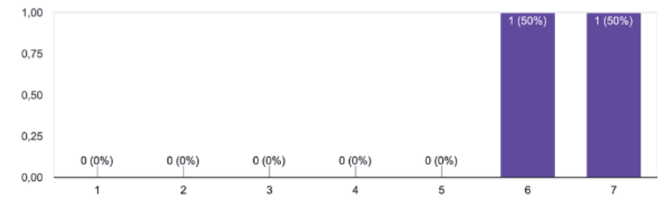
Op een schaal van 1 tot 7, hoe duidelijk vond je de formulering van de fasering op het obstakelbord? (horizontale thema's)

2 antwoorden



Hoe nuttig vond je de structuur en organisatie van het obstakelbord?

2 antwoorden



Heb je nog andere opmerkingen, suggesties of feedback met betrekking tot het obstakelbord die je wilt delen?

2 antwoorden

Wie is de eigenaar van een risico?

Belangrijk om SMART te werken met het bord. Veel tekst is niet handig.

Zou je het obstakelbord aanbevelen als een nuttig hulpmiddel voor toekomstige projecten? Waarom wel of niet?

1 antwoord

zeker wel. Wel nodig om eea in de tijd in te perken. Je kunt heel veel discussie voeren, maar belangrijk om expliciet te worden.

Op welke manier heeft het obstakelbord bijgedragen aan het bewustzijn en begrip van de obstakels en risico's binnen het projectteam?

1 antwoord

In eerste plaats aandacht en structuur. We blijken veel meer discussies te kunnen en moeten voeren dan we dachten. Het bord stimuleert nadrukkelijk om risico's te benoemen. Daarnaast blijken we toch een eigen beeld van de risico's en obstakels te hebben. Ook al dachten we daar hetzelfde over te denken. Deze tool geeft een expliciet moment en ruimte om eea goed door te spreken.

Zijn er bepaalde obstakels of risico's die je zou willen toevoegen op basis van hun impact op het project?

1 antwoord

We bemerken dat we bepaalde risico's niet hebben benoemd en moeten deze gaan toevoegen. Extra thema's hebben we vooralsnog niet

Rationale on why this Handout is needed to implement effectively

Over the past few years, multiple research papers have highlighted the high failure rates, which range from 20-90%, for implementing complex innovations. These failure rates indicate a clear problem with implementation practices. However, there is an even more pressing issue as there is still much to be discovered about why these implementation processes fail. Despite this, there is a lack of comprehensive understanding about why these failures occur. Many scientific studies focus on individual cases, overlooking broader patterns that affect implementation effectiveness. Additionally, the multi-level nature of implementation makes it difficult to address issues beyond project boundaries. Existing literature lacks coherence in understanding the entire implementation process, and practical guidance often falls short in addressing implementation dynamics. Therefore, implementation research should aim to bridge these gaps and offer practical solutions for guiding implementation complexities effectively.

This handout provides a comprehensive overview of the main findings from a study that researched how to create a coherent approach to implementing effectively. The thesis aims to provide a solution for the field of implementation practice. It has done so by identifying common patterns and issues, recognizing the multi-level and dynamic nature of implementation, and bridging the gap between evidence-based literature and practical application. An innovation is generally something that is somewhat new to its developers and/or potential users and can consist of a product, service, program, or technology, etc. Implementation is a period of activities and practices in which the targeted employees become more skilled, consistent, and committed in using the innovation. The effectiveness of the implementation is described throughout the literature as the quality and consistency with which the targeted organisational members (employees that need to use the innovation) use the innovation.

This handout contains the Quality Implementation Framework, which is a step-by-step approach that describes the "how-to" of implementation. It provides insights into the specific procedures and strategies that are important for effective implementation and thus aims to achieve quality and consistent use of the innovation. It does so by explaining fourteen steps that each are accompanied with a series of tasks. The tasks consist of a series of questions that need to be answered that guide the team to reaching the goal of that step. Each step also contains a series of actions. These actions are researched to be important as they will all influence the effectiveness of implementation. Executing the tasks, keeping in mind all the actions will set you up for succesful implementaiton.

The final part of each step highlights a more theoretical construct that plays a role in an organisation. This can consist of four complex theoretical constructs: Innovation-Value fit, Implementation Culture, Abostoption Capacity, or Event System Theory (executed by an tool: The Obstacle Board). These four constrcut each play a vital role in implementation endeavours and an exercise must therefor be executed after each step to account for these constructs.

If you are interested in more in-depth information of how this handout was formed, I would recommend to consult the master thesis of Annemeike Schermer, which can be aquired through the repository of the TU Delft.

How to use this Handout

Congratulations! You have acquired this content that can help your organisation implement more effectively and therefore improve the consistency and quality of use by your employees who are required to use the innovation. This content contains several frameworks and tools to improve your implementation endeavours. It includes a roadmap with fourteen steps, each with explanations of why that step is important and which actions need to be taken to elicit effective implementation.

The steps within the roadmap are similar every time. First, a reflection must be executed on the previous step to check if it has been executed correctly and if the team is ready for the next step. If the previous step is completed correctly, several questions will help you identify different elements to complete the step. Once done, an Obstacle Board session can be executed to identify risks that may hinder the project.

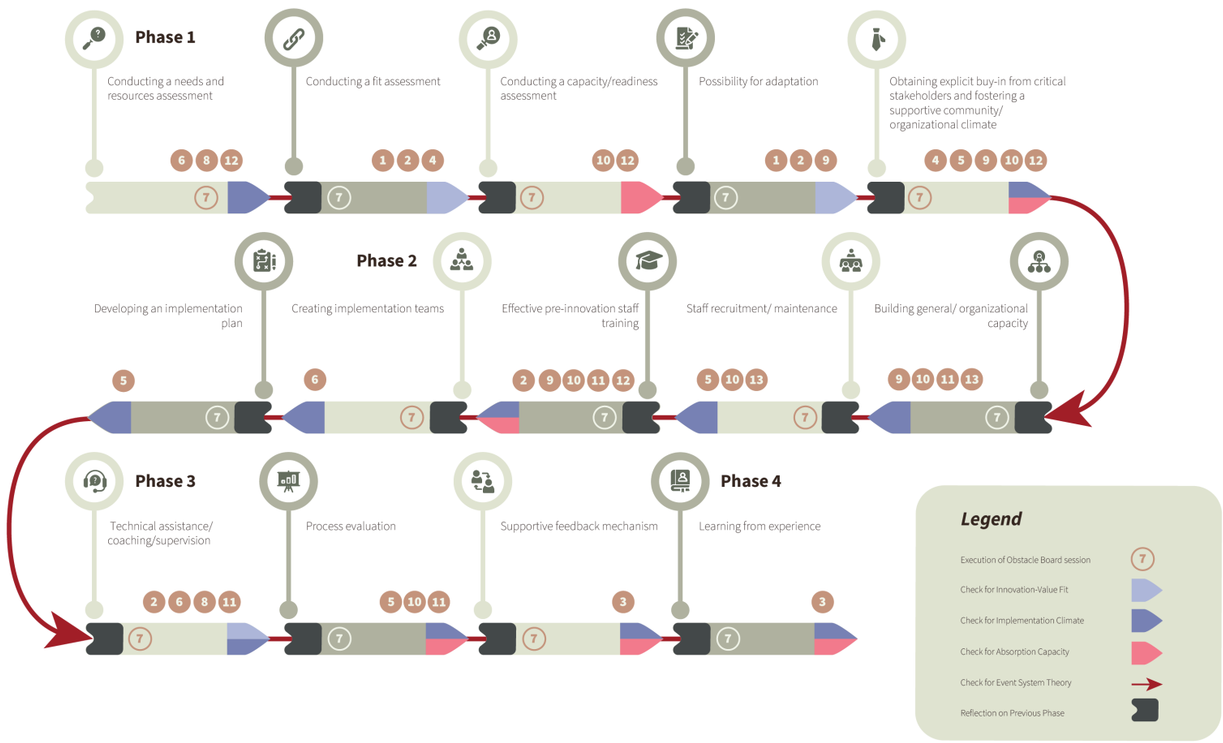
The last part of each step contains a check for one of four constructs: Innovation-Value fit, Implementation Climate, Absorption Capacity, or Events. The initial three constructs are explained on separate sheets. If an (unexpected) event has become important, please execute the Obstacle Board exercise.

Good luck with your implementation endeavours!

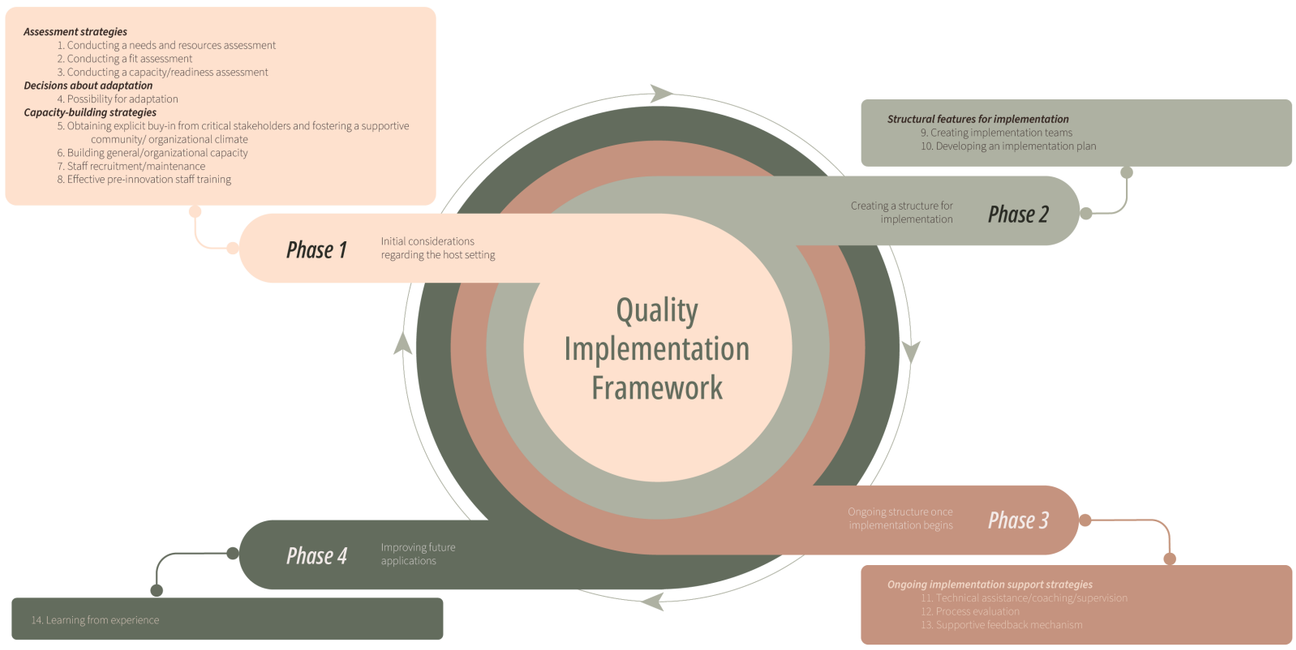
This handout contains:

A. The Quality Implementation Framework
B. 13 Actions to Elicit Effective Implementation
C. How to Check for Innovation-Value Fit: Value Proposition Canvas
D. How to Check for Implementation Climate: Implementation Culture Readiness test
E. How to Check for Absorption Capacity: Test and Learning Cards
F. Execution of Obstacle Board Session
G. A Roadmap to Quality Implementation and 14 steps to implement effectively

A Roadmap to Quality Implementation



Quality Implementation Framework



Aquired from:
Meyers, D. C., Durlak, J. A., & Wandersman, A. (2012). The quality implementation framework: a synthesis of critical steps in the implementation process. American journal of community psychology, 50, 462-480.

1

During innovation adoption, select innovations by prioritising organisational members' needs over other considerations

2

Prioritise the development of features and processes based on the needs of targeted members

3

Ensure successful handover to the business unit or new project members

4

Prioritise the correct use of the innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs)

5

Provide clear and involved innovation and process support

6

Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

7

Quickly address unexpected changes to minimise impact.

8

Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects

9

Enhance the quality, accessibility, and user-friendliness of the innovation.

10

Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

11

Allocate time for users to experiment with the innovation

12

Ensure effective communication regarding the reasons for implementing the innovation

13

Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions

13 Actions to Elicit Effective Implementation

Step 1:
Conducting a needs and resources assessment

1. Answer the following questions:
   A. Why are we innovating?
   B. What problems or conditions will the innovation address (i.e., the need for the innovation)?
   C. What part(s) of the organization and who in the organization will benefit from improvement efforts?
2. Execute the Obstacle Board task to identify risks regarding the questions
3. Check for Implementation Climate

6

Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

8

Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects

12

Ensure effective communication regarding the reasons for implementing the innovation

Phase 1

Step 2:
Conducting a fit assessment

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Does the innovation fit the setting?
   B. How well does the innovation match the:
      I. Identified needs of the organization/community?
      II. Organization's mission, priorities, values, and strategy for growth?
      III. Cultural preferences of groups/consumers who participate in activities/services provided by the organization/community?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Innovation-Value Fit

1

During innovation adoption, select innovations by prioritising organisational members' needs over other considerations

2

Prioritise the development of features and processes based on the needs of targeted members

4

Prioritise the correct use of the innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs)

Phase 1

Step 3:
Conducting a capacity/readiness assessment

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Are we ready for this?
   B. To what degree does the organization/community have the will and the means (i.e., adequate resources, skills and motivation) to implement the innovation?
   C. Is the organization/community ready for change?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Absorption Capacity

10

Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

12

Ensure effective communication regarding the reasons for implementing the innovation

Phase 1

Step 4:
Possibility for adaptation

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Should the planned innovation be modified in any way to fit the host setting and target group?
   B. What feedback can the host staff offer regarding how the proposed innovation needs to be changed to make it successful in a new setting and for its intended audience?
   C. How will changes to the innovation be documented and monitored during implementation?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Innovation-Value Fit
5. Decide on innovation adoption once the Innovation fits the questions derived from Step 1-4

1

During innovation adoption, select innovations by prioritising organisational members' needs over other considerations

2

Prioritise the development of features and processes based on the needs of targeted members

9

Enhance the quality, accessibility, and user-friendliness of the innovation.

Phase 1

Step 5: Obtaining explicit buy-in from critical stakeholders and fostering a supportive community/organisational climate

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Do we have genuine and explicit buy-in for this innovation from:
      I. Leadership with decision-making power in the organization/community?
      II. From front-line staff who will deliver the innovation?
      III. The local community (if applicable)?
   B. Have we effectively dealt with important concerns, questions, or resistance to this innovation? What possible barriers to implementation need to be lessened or removed?
   C. Can we identify and recruit an innovation champion(s)?
   D. Are there one or more individuals who can inspire and lead others to implement the innovation and its associated practices?
   E. How can the organization/community assist the champion in the effort to foster and maintain buy-in for change?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate and Absorption Capacity

9

Enhance the quality, accessibility, and user-friendliness of the innovation.

4

Prioritise the correct use of the innovation by targeted organisational members as part of the personal evaluation of the decision-making unit, ensuring alignment with key performance indicators (KPIs)

10

Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

5

Provide clear and involved innovation and process support

12

Ensure effective communication regarding the reasons for implementing the innovation

Phase 1

Step 6:
Building general/organisational capacity

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. What infrastructure, skills, and motivation of the organization/community need enhancement in order to ensure the innovation will be implemented with quality?
   Of note is that this type of capacity does not directly assist with the implementation of the innovation, but instead enables the organization to function better in a number of its activities (e.g., improved communication within the organization and/or with other agencies; enhanced partnerships and linkages with other agencies and/or community stakeholders).
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate

10
Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

11
Allocate time for users to experiment with the innovation

9
Enhance the quality, accessibility, and user-friendliness of the innovation.

13
Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions

Phase 1

Step 7:
Staff recruitment/maintenance

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Who will implement the innovation?
   B. Initially, those recruited do not necessarily need to have knowledge or expertise related to use of the innovation; however, they will ultimately need to build their capacity to use the innovation through training and on-going support
   C. Who will support the practitioners who implement the innovation?
   These individuals need expertise related to (a) the innovation, (b) its use, (c) implementation science, and (d) process evaluation so they can support the implementation effort effectively
   D. Might roles of some existing staff need realignment to ensure that adequate person-power is put towards implementation?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate

5
Provide clear and involved innovation and process support

10
Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

13
Provide rewards for innovation use, such as promotions, praise from supervisors, or improved working conditions

Phase 1

Step 8:
Effective pre-innovation staff training

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Can we provide sufficient training to teach the why, what, when, where, and how regarding the intended innovation?
   B. How can we ensure that the training covers the theory, philosophy, values of the innovation, and the skill-based competencies needed for practitioners to achieve self-efficacy, proficiency, and correct application of the innovation?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate and Absorption Capacity

10
Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

2
Prioritise the development of features and processes based on the needs of targeted members

11
Allocate time for users to experiment with the innovation

9
Enhance the quality, accessibility, and user-friendliness of the innovation.

12
Ensure effective communication regarding the reasons for implementing the innovation

Phase 1

Step 9:
Creating implementation teams

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Who will have organizational responsibility for implementation?
   B. Can we develop a support team of qualified staff to work with front-line workers who are delivering the innovation?
   C. Can we specify the roles, processes, and responsibilities of these team members?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate

5
Provide clear and involved innovation and process support

Phase 2

Step 10:
Developing an implementation plan

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Can we create a clear plan that includes specific tasks and timelines to enhance accountability during implementation?
   B. What challenges to effective implementation can we foresee that we can address proactively?
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate

6

Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

8

Improve planning quality and clarify project requirements to enable the implementation team to address non-innovation-related requirements in projects

2

Prioritise the development of features and processes based on the needs of targeted members

11

Allocate time for users to experiment with the innovation

Phase 2

Step 11:
Technical assistance/coaching/supervision

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Can we provide the necessary technical assistance to help the organization/community and practitioners deal with the inevitable practical problems that will develop once the innovation begins?
   B. These problems might involve a need for further training and practice in administering more challenging parts of the innovation, resolving administrative or scheduling conflicts that arise, acquiring more support or resources, or making some required changes in the application of the innovation
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate

5

Provide clear and involved innovation and process support

10

Ensure high quality and quantity of the organisation's training efforts to familiarise members with the innovation

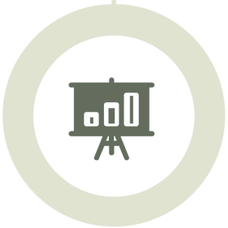
11

Allocate time for users to experiment with the innovation

Phase 3

Step 12:
Process evaluation

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Do we have a plan to evaluate the relative strengths and limitations in the innovation's implementation as it unfolds over time?
   B. Data are needed on how well different aspects of the innovation are being conducted as well as the performance of different individuals implementing the innovation
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate and Absorption Capacity



3

Ensure successful handover to the business unit or new project members

Phase 3

Step 13:
Supportive feedback mechanism

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. Is there an effective process through which key findings from process data related to implementation are communicated, discussed, and acted upon?
   B. How will process data on implementation be shared with all those involved in the innovation (e.g., stakeholders, administrators, implementation support staff, and front-line practitioners)?
   C. This feedback should be offered in the spirit of providing opportunities for further personal learning and skill development and organizational growth that leads to quality improvement in implementation
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate and Absorption Capacity

3

Ensure successful handover to the business unit or new project members

Phase 3

Step 14:
Learning from experience

1. Execute a reflection exercise on the previous step.
2. Answer the following questions:
   A. What lessons have been learned about implementing this innovation that we can share with others who have an interest in its use?
   B. Researchers and innovation developers can learn how to improve future implementation efforts if they critically reflect on their experiences and create genuine collaborative relationships with those in the host setting
   C. Collaborative relationships appreciate the perspectives and insights of those in the host setting and create open avenues for constructive feedback from practitioners on such potentially important matters as: (a) the use, modification, or application of the innovation; and (b) factors that may have affected the quality of its implementation
3. Execute the Obstacle Board task to identify risks regarding the questions
4. Check for Implementation Climate and Absorption Capacity

6

Regularly assess the progress of related projects to facilitate collaboration and coordination to minimise the influence of parallel innovations with competing sub-goals

Phase 4

How to Check for Absorption Capacity: Test and Learning Cards

You are able to check if your innovation has been made clear for the user and if they are able to work with it, by using the Test and Learning Card. The Test Card can be used to specify what you expect the employees to learn, for example a specific tool or new feature they must use. The Learning card can be used after the employees have had the training to test if your training and exlenations have elicit the right effect.

QR-code to webiste with more explenation on AC

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The Test Card

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Test name:	Duration:
Assigned to:	Deadline:

STEP 1: HYPOTHESIS

We believe that

STEP 2: TEST

To verify that, we will

STEP 3: METRIC

And measure

STEP 4: CRITERIA

We are right if

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Learning Card

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Test Name	Deadline
Assigned to	Duration

STEP 1: HYPOTHESIS

We believed that

STEP 2: OBSERVATION

We observed

STEP 3: LEARNINGS AND INSIGHTS

From that we learned that

STEP 4: DECISIONS AND ACTIONS

Therefore we will

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How to Check for Implementation Climate: Implementation Culture Readiness test

You can use the Value Proposition Canvas to test if the innovation fits the values of your targeted user. This Canvas helps you to identify your employee's major Jobs-to-be-done, the pains they face when trying to accomplish their Jobs-to-be-done and the gains they perceive by getting their jobs done. You can visualise the most important components of your innovation, how you relieve pain and create gains for your customers.

QR-code to webiste with more explenation on IC

Implementation Culture Readiness

How ready are you to become an invincible company?

- ☐ Give your company a score from 1 to 5 for each area.
- ☐ Define which area you'd like to improve over the next 12 and 36 months.
- ☐ Eliminate the blockers and implement the enablers that will help you achieve your improvement goals.

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		BEGINNER *We have little to no experience with this topic*	*We have some experience*	INTERMEDIATE *We regularly work this way, but not systematically*	*We frequently work this way*	WORLD CLASS *Our practice is used as a case study for others to learn from*
Leadership Support	Strategic Guidance	1 Leadership does not provide explicit strategic guidance for innovation	2	3 There is some strategic guidance for innovation but not everybody in the company knows it	4	5 Leadership provides strategic innovation guidance at important meetings and everybody knows it
	Resource Allocation	1 Resources for innovation are bootstrapped or on an ad-hoc project basis	2	3 Resources for innovation are available, but they are not substantial and not protected	4	5 Resources for innovation are institutionalized and leaders commit at least 50% of their time to innovation
	Portfolio Management	1 Leadership is mainly focused on improving the core business	2	3 We make some investments to explore the future and new business models, but it's not systematic	4	5 Leadership is eager to pioneer and invests in a large innovation pipeline of small bets of which the best get follow-up investments
Organizational Design	Legitimacy and Power	1 Innovation projects are skunk work and outside official channels	2	3 Innovation is officially in the org chart, but lacks power and influence	4	5 Innovation is at the very top of the org chart and has power and influence
	Bridge to the Core	1 Innovation teams have limited or no access to customers, resources, and skills of the core business	2	3 The core business and innovation teams collaborate, but there are conflicts	4	5 There are clear policies that help innovation teams and the core business collaborate as equal partners
	Rewards and Incentives	1 Innovation does not have a dedicated incentive system that differs from the core business	2	3 We have some incentives in place to encourage innovation and reward it differently from execution	4	5 Innovation has a dedicated incentive system that rewards experimentation and new value creation
Innovation Practice	Innovation Tools	1 We do not use business model, lean startup, or design thinking tools for innovation	2	3 Business model, lean startup, or design thinking tools are used in pockets of the organization	4	5 Business model, lean startup, or design thinking tools are widely adopted and mastered
	Process Management	1 Our processes are linear and requiredetailed business plans with financial projections	2	3 We occasionally use iterative processes and systematic business experiments to test business ideas	4	5 Our processes are optimized for innovation and we systematically measure the reduction of risk in new ideas
	Innovation Skills	1 We don't hire for innovation skills and experience and don't develop them	2	3 We occasionally hire experienced innovation talent and train some specialized staff in innovation	4	5 We hire and develop world class innovation talent with extensive experience across the organization

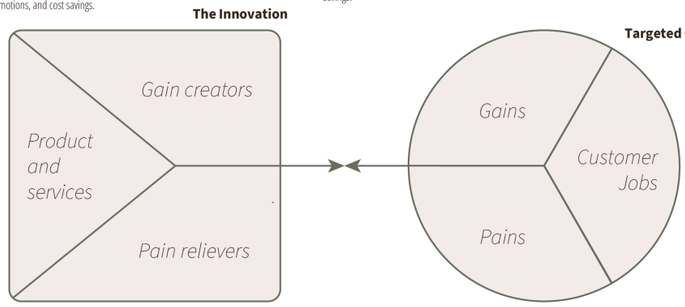
How to Check for Innovation-Value Fit: Value Proposition Canvas

You can use the Value Proposition Canvas to test if the innovation fits the values of your targeted user. This Canvas helps you to identify your employee's major Jobs-to-be-done, the pains they face when trying to accomplish their Jobs-to-be-done and the gains they perceive by getting their jobs done. You can visualise the most important components of your innovation, how you relieve pain and create gains for your customers.

QR-code to webiste with more explenation on VPC

Gain Creators describe how your products and services create employee gains. They explicitly outline how you intend to produce outcomes and benefits that your employee expects, desires, or would be surprised by, including functional utility, social gains, positive emotions, and cost savings.

Gains describe the outcomes and benefits your employee want. Some gains are required, expected, or desired by employees, and some would surprise them. Gains include functional utility, social gains, positive emotions, and cost savings.describe the outcomes and benefits your employee want. Some gains are required, expected, or desired by customers, and some would surprise them. Gains include functional utility, social gains, positive emotions, and cost savings.



Product and Service describes the innovation you try to implement within your organisation. Describe its general function, the goals it must met and how it works. Be explicit about what the innovation should be able to do.

Jobs describe the things your employees are trying to get done in their work . A job could be the tasks they are trying to perform and complete, the problems they are trying to solve, or the needs they are trying to satisfy.

Pain relievers describe how exactly your products and services alleviate specific employee pains. They explicitly outline how you intend to eliminate or reduce some of the things that annoy your employee before, during, or after they are trying to complete a job or that prevent them from doing so.

Pains describe anything that annoys your employee before, during, and after trying to get a job done or simply prevents them from getting a job done. Pains also describe risks, that is, potential bad outcomes, related to getting a job done badly or not at all.

Execution of Obstacle Board Session

The Obstacle Board is a tool designed to assist project teams in identifying obstacles on a regular basis. It serves as a visual representation of the various phases of a project, highlighting the different themes and subjects that can impact its implementation. The board features a table structure in which the project team is asked to hang post-its that represent obstacles. The process of identifying obstacles is an activity executed by the project team and aims to evoke discussion beyond updates by giving the team members the opportunity to express their concerns and issues. By raising these concerns, other team members will be able to join on the discussion which has the goal to evoke the identification of latent concerns which otherwise are overlooked.

The vertical axis of the table provides the different themes identified in the second session. These themes are accompanied with prompting sub-themes to help the project team guide to subjects that influence implementation. For example: The main theme “Strategy” is further explained by the sub-themes “Objectives, Planning, Execution, Evaluation and adaptation, Monitoring and control”.

The horizontal axis contains different project phases that guides the team in recognizing obstacles from the current project phase to the upcoming one. Additionally, it provides space for identifying obstacles that may not be relevant in the immediate future but could become significant later on.

If an (unexpected) event occurrs, an Obstacle Board session can be executed to evaluate the situation and identify actions to be taken to solve the issue.


TU Delft