Drivers and barriers towards the use of Agile methods in local governments; a team perspective

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TU Delft

Preface

During my thesis, I have met many inspiring people. However, the process that led me in this direction started way before. I would like to thank my uncle Herman for subliminally steering me towards this path of study, even though it might not have been his intention. I would like to thank my Computer Science professors Mauricio Aniche and Annibale Panichella for first introducing me to software engineering methods through what can only be described as the most inspiring and relatable (Lord of the Rings-based) lectures of the program, additionally providing me with the opportunity to guide the course and the material to others. This experience greatly influenced my decision to pursue master's degrees in both Management of Technology and Education.

Trying to find guidance for Agile or Project Management within the TPM faculty proved to be a difficult task. Despite an overfull agenda, my supervisor Marijn Janssen made time for me, and I could not have asked for better guidance in combination with the expert opinions from Rini van Solingen. Also, thanks to Johannes Gartner for his support and insights.

At Provincie Zuid-Holland, I benefited from the excellent guidance of Roos Aafjes and Bram de Vogel. Not only did they introduce and help me find my way through the organisation, but they also provided excellent feedback on my research, especially in defining my research problem. Additionally, I would like to thank all the people who assisted me during my interviews and surveys, with special mention to Roeland Mijlhoff, who helped me apply the results in practice. Thanks to Theo Geelen, Tom van den Eijnden, and David Smits for providing me with an expert perspective on Agile transformations.

Finally, I would like to thank my parents for their unwavering support and readiness to help. Thanks to Joey, Adi, and Toby for sharing our struggles, and best of luck with finishing your own theses. Thanks to Ying for sacrificing many weekends and evenings to provide me with feedback. I would like to thank my cats for maintaining my mental well-being and keeping my lap warm during the long days and nights. Finally, a special thanks to my girlfriend Jasmine for keeping me healthy and alive during these challenging times.

L.J. in 't Veen
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Summary

Increased demands for digitization and customer collaboration have created a pressing need for research into the application of Agile methods within local government settings (Serrador and Pinto, 2015). Agile is a form of project management that focuses on customer satisfaction, individual interactions, and flexibility as summarised in the Agile manifesto (Beck et al., 2001). As governments strive to provide highly available, flexible, and efficient digital services, understanding how Agile practices can be effectively implemented is critical. The unique challenges faced by local governments, such as the need for data-driven decision-making and policy development, difficulties acquiring expertise, and accountability necessitate a tailored approach to Agile adoption (Kurnia et al., 2022; Mergel, 2017). Despite the recognised importance, there is a lack of research focusing on Agile methods from a team perspective within local governments, highlighting the need for more studies that address this crucial angle (Morley, 2022; Jovanović et al., 2020).

This thesis explores the use of Agile methods within project teams in local government organisations in the Netherlands and develops a practical framework to stimulate Agile practices. Within three local governments, fifteen teams displaying varying forms and maturity of Agile methods were interviewed. The study provides deeper insights into how the use of Agile methods impacts local governments and how teams perceive their performance.

Research Questions and answers

The main question this study tries to answer is: **How can project teams in local governments stimulate the use of Agile methods?**. To develop a practical framework for teams the following subquestions were addressed.

What team archetypes represent the typical use of Agile methods in local governments?

Answer: 7 Archetypes were developed representing types of Agile teams based on the used framework, the reason for using their framework, the experience and the management support. Following this approach, teams were categorised into Archetypes representing typical ways teams experience the context of local governments. The resulting Archetypes are traditional teams, beginning teams, Kanban teams, lack of commitment and knowledge in organisation teams, lack of knowledge in organisation teams, management commitment & expertise teams, and bridging teams. This categorization provides a basis for comparing and contrasting different Agile implementations.

What barriers and drivers towards the use of Agile methods are experienced by the teams?

Answer: By comparing drivers and barriers experienced by teams with the literature, this study examines the use of Agile methods in local governments. Key barriers include a lack of management support, lack of focus, lack of knowledge, unclear roles, lack of alignment, and organisational resistance to change. Important drivers for the use of Agile methods include an Agile mindset, Agile coaching, dedicated key roles, dedicated management, and freedom to experiment and structure. Each archetype faced unique barriers and drivers, which were crucial in tailoring specific strategies for increasing the use of Agile methods.

How do different types of (Agile) team management impact the perceived performance by team members?

Answer: No significant difference in perceived performance was observed between team archetypes, indicating that perceived performance may be influenced by a broader range of factors beyond the scope of this study. Overall perceived performance was consistent and might indicate that teams from the same organisation experience similar levels of perceived performance.

Answering the sub-questions enabled answering the main research question by creating a practical framework that teams in local governments can use to stimulate the use of Agile methods (see Figure 1). The framework provides guiding principles for every type of (Agile) team within local governments. Teams can use this framework to focus on key drivers and barriers that help increase the use of Agile methods incrementally.

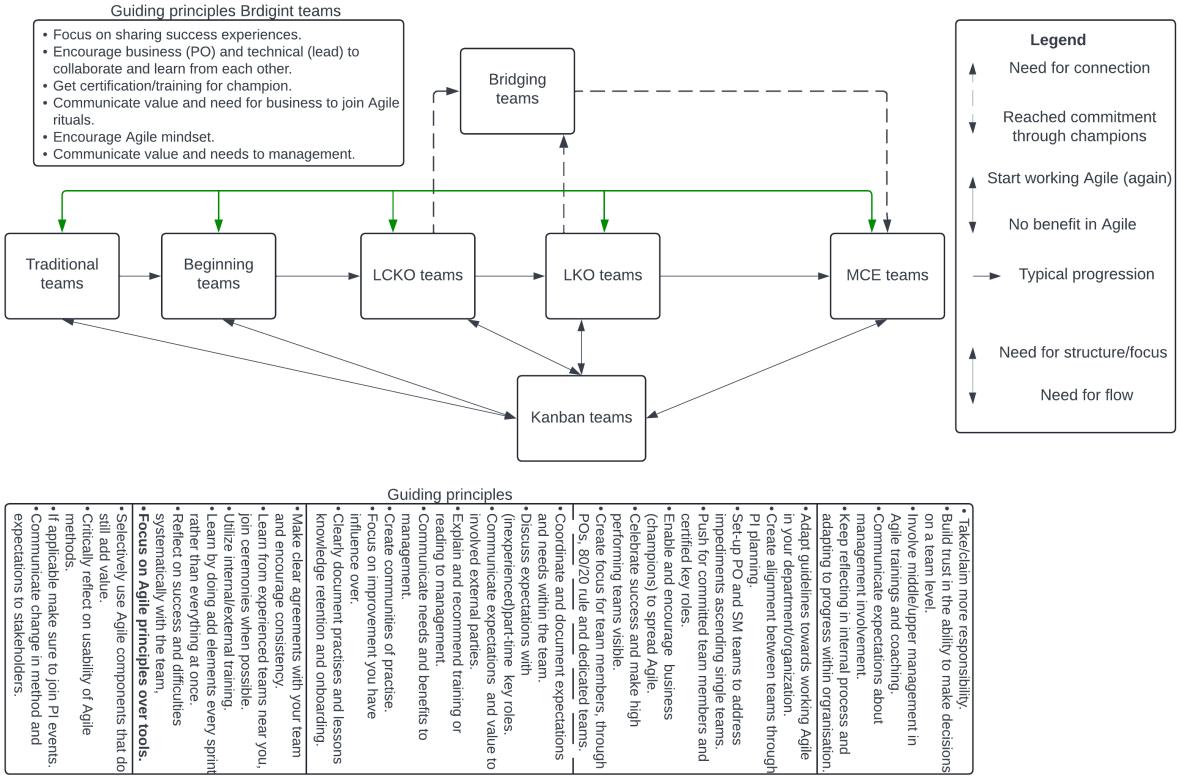

Figure 1: Agile team advancement framework

The Agile team advancement framework shows 7 blocks containing the 7 team archetypes resulting from sub-question 1. Here LCKO, LKO and MCE stand for Lack of commitment and knowledge organisation, Lack of knowledge organisation and Management commitment & knowledge respectively. Arrows indicate possible moves from one archetype to another. The middle row shows a typical progression towards increasing the use of Agile methods. On the right side, the typical reason to move in the direction of the arrow is denoted. The striped arrows indicate there are certain conditions for bridging teams; These teams require a champion and a possibility for business and technical teams to collaborate. The green arrows indicate a path that can only be taken backwards or forwards to the same block you came from. Finally, the blocks on the top and bottom hold guiding principles to progress per archetype. The Guiding principle blocks for LCKO and LKO teams have a striped border as there is an overlap between their guiding principles.

Guiding principles were developed by addressing specific barriers and leveraging key drivers identified in the study. The practical framework includes incremental steps for Agile maturity, allowing teams to navigate organisational challenges, enhance team collaboration, and align with best practices for Agile transformation. A prominent feature of the framework is the emphasis on bridging teams between IT and business functions. This approach addresses the siloed nature of local government organisations and promotes better alignment, communication, and collaboration.

Contribution

This research provides valuable insights and an Agile team advancement framework for local government project teams, offering actionable steps to effectively stimulate the use of Agile methods. The

study significantly contributes to the understanding of Agile methods within the context of local government organisations, an area relatively underexplored compared to the private sector. It provides a foundation for future research to develop context-specific tools and frameworks tailored to the unique requirements of local government teams. Additionally, the team perspective offers a refreshing view on the subject matter.

Future Research

Future research should expand to include more diverse local government contexts, incorporate quantitative data, and validate findings as well as the long-term effects of the framework's application in local governments. Additionally, several research gaps were identified. Approaches developed within this research can be used as a basis for further exploration of local governments with a team perspective.

Contents

Nomenclature

Abbreviations

Abbreviation	Definition
BA	Business Analyst
DEV	Developer
Exp	Experience
LCKO	Lack of commitment and knowledge in organization
LKO	Lack of knowledge in organization
MCE	Management commitment & experience
PI	Program Increment
PM	Product Manager
PO	Product Owner
SM	Scrum Master
STD	Standard Deviation
STUM	Stand Up Meeting
TAM	Technology Acceptance Model

Glossary

Key term	Definition
Agile	A form of project management that focuses on customer satisfaction, individual interactions, and flexibility as summarised in the Agile manifesto (Beck et al., 2001).
Agile mindset	Attitude towards learning spirit, attitude towards collaborative exchange, attitude towards empowered self-guidance and attitude towards customer co-creation (Eilers et al., 2022).
Agile use	The number of teams utilising Agile methods and the maturity of teams using Agile methods. Agile use highlights the teams' interaction with Agile methods where adoption refers to integrating Agile practices in a broader sense.
Archetype	Archetypes represent typical examples of types of Agile teams based on some differentiating characteristics.
Culture	Collective values, norms and practices within organisations that influence their behaviour and interactions.
Perceived performance	Perceived usefulness, perceived ease of use and perceived project success.

1

Introduction

In project management for IT teams, Agile has become the standard for many project teams to keep up with the increasing demand for digitization and flexibility (Serrador and Pinto, 2015). Agile is a form of project management that focuses on customer satisfaction, individual interactions, and flexibility as summarised in the Agile manifesto (Beck et al., 2001). In the field of IT, with short development cycles and uncertain goals, working Agile is shown to relate to higher perceived project success (Serrador and Pinto, 2015). Important factors contributing to this success are higher customer satisfaction and increased project visibility. Many teams use frameworks that implement Agile principles such as Scrum (Schwaber and Sutherland, 2011) or Kanban (GRAVES et al., 1995) to guide their processes. T In larger scales, success can be found through the use of scaled Agile methods such as Nexus (Scrum.org, 2021), Scrum@Scale (Sutherland and Scrum.org, 2022) or SAFe (Scaled Agile, Inc., 2024b).

Despite the shown success, some teams are still (partly) using traditional sequential methods such as the Waterfall or V-model which don't allow for changes or refinement during development (Balaji and Murugaiyan, 2012). Flaws during product development often require expensive restarts, and administrative overhead can lead to slow processes. Not involving the client from the beginning and lack of feedback can potentially lead to misalignment which is often only verified at the end of a project. While there are many advantages to working with Agile over traditional methods, not nearly all organisations work fully Agile. A recent survey by State of Agile (Digital.ai, 2023) shows that 71% of respondents use Agile and 42% reported working hybrid (a combination of Agile and traditional methods). Larger organisations work less Agile than smaller organisations. organisations not fully adopting Agile mostly feel culture (i.e. collective values, norms and practices within organisations that influence their behaviour and interactions) and mindset are the biggest challenges (Capgemini research institute, 2019). Culture is a critical factor in determining the success of Agile use, as it affects how teams collaborate, respond to change, and implement new methods. Agile transformations are therefore most challenging for large organisations with established ways of working or traditional management and culture.

One branch of large organisations that often still use traditional management is large governments. Similar to private IT-based organisations, governments experience a need for digitization led by an expectancy for highly available, flexible, and efficient digital products (Mergel et al., 2018). Additionally, governments see a need for the application of data-driven tools to be able to develop predictive tools for policy measures. Agile provides a way to achieve and support these needs while improving governments' internal and external visibility. However, governments face some additional challenges in implementing an Agile approach. Governments can be seen as very large nonprofit organisations, usually still relying on Waterfall-centric governance (Scaled Agile, Inc., 2024a).

There are many reasons for delays in adopting Agile within governments. In terms of culture, previous unsuccessful attempts to implement Agile have created resistance to try again. Besides, there is often

a lack of experience with Agile and Agile contracts, long acquisition lifecycles creating delays, and a lack of common framework between programmes or teams. In response, a tailored approach towards implementing Agile for governments is required. Previous examples often use a bottom-up approach to spread the use of Agile methods in governments, showing the importance of teams in the Agile transition (Rigby et al., 2016). At a team level, the focus should be on collaboration across teams and culture. A change in mindset is needed to not rely on escalation as a means to move projects forward.

Local governments share most of these difficulties, with the additional challenge of executing national policies at a local scale. The unique and specific requirements per local government require customization and close collaboration with customers. Yet, there is a glaring lack of research on dealing with challenges associated with applying agile methods in local governments, some suggest reorganising and combining local governments or acquiring expertise in the form of Agile practitioners (Kurnia et al., 2022). However, organising local governments risks losing sight of the particularities of each local government. While acquiring expertise seems straightforward, in practice, it is increasingly hard to find the right expertise and capacity (Mergel, 2017). Others suggest new theoretical frameworks for organising the local government (Car-Pušić et al., 2019). While this holds merit, it does not provide immediate practical applications that can be applied by teams.

Theoretical frameworks often show what the ideal situation should look like and consider mostly success cases (Jovanović et al., 2020), but in practice teams often find themselves in different situations. Agile transition literature advises management on steps to advance their organisation but can neglect the team perspective (Morley, 2022). To deal with the particular context within local governments a more practical approach is required focused on a team perspective.

An internal report at a local government organisation in the Netherlands (which cannot be publicly shared) highlights inconsistent implementation of Agile methods and frameworks across teams, resulting in sub-optimal product delivery. Teams are using different project management methods, each with its own rhythms and requirements, complicating collaboration and communication. This inconsistency is partly due to a lack of awareness about the requirements and benefits of Agile, leading to lower commitment and miscommunication, which create barriers to effective Agile adoption.

Although the organisation's strategy outlines outsourcing software development, in practice, more in-house development is occurring than expected. This discrepancy can be attributed to market supply issues and the need for highly specialized skills and data management. The organization suffers from a lack of cohesion and an overview of what different teams are developing, leading to fragmented efforts. Furthermore, the data quality, project management, and software processes lack structure and clear agreements, signalling a clear need for comprehensive guidelines and frameworks. To support teams in stimulating the use of Agile methods within the unique context of local governments, a hands-on practical guiding framework is essential.

Research objective

Despite the growing need for digital transformation and the potential benefits of Agile methods, the use of Agile methods in local government settings is not well understood. The current situation is worsened by a lack of cohesion and guidelines for project teams to effectively improve their practices. This study aims to explore these challenges and provide a practical framework for teams to stimulate the use of Agile methods within their organisation. Additionally, the study aims to provide deeper insights into how the use of Agile methods impacts local governments and how teams perceive its performance.

1.1. Research question and sub-questions

The main question this study answers is: **How can project teams in local governments stimulate the use of Agile methods?** The focus is on drivers and barriers affecting the use of Agile methods by teams. Fifteen Project teams within local governments in the Netherlands are analysed. The teams display varying forms and maturity of Agile methods.

To support answering the research question, teams are divided into different archetypes. Archetypes are types of Agile teams based on the used framework, the reason for using their framework, the experience and the management support. Drivers and barriers in different categories will be compared to literature to extract guidelines and develop an Agile team advancement framework with which teams could gradually increase their Agile maturity. The perceived performance by teams will be evaluated and compared across team archetypes. Additionally, propositions for further research will be brought forward based on findings. This process requires the following sub-questions to be answered:

1. What team archetypes represent the typical use of Agile methods in local governments?

   Following this question, the teams should be categorised into archetypes based on 4 several dimensions relating to Agile maturity.

2. What barriers and drivers towards the use of Agile methods are experienced by the teams?

   This question aims to find the underlying drivers and barriers and formulate pre-conditions that can block or catalyse the use of Agile methods.

3. How do different types of (Agile) team management impact the perceived performance by team members?

   This question aims to determine how team members experience the current way of working.

The first sub-question results in a categorization that will support comparison between types of teams while answering the other research questions. Drivers and barriers per team are found and compared to the literature in sub-question 2. Guiding principles are subsequently found by comparing drivers and barriers between team archetypes. The first 2 sub-questions focus on a representative per team, to incorporate the opinions of all team members sub-question 3 is added. Comparing perceived performance per team archetype could provide a way to rank archetypes from a team perspective.

1.2. Educational perspective

This research combines a background in Computer Science Engineering with Policy Management. The main knowledge source comes from Management of Technology where the researcher learned a management perspective on how methodologies can impact the development of products. The most important resource for Agile development is the teams themselves, and this research serves to understand the perspective of teams as well as guide these teams in a complex organisational setting. The education prepared the researcher to take multiple stakeholders' perspectives into account and approach the problem from a sociotechnical perspective. Methods for qualitative research as well as analysis of process methods and the development of frameworks based on this systematic analysis proved invaluable. Finally, elective courses gave insight into the public domain and the impact and complexity of policy decisions.

Structure of the thesis

Chapter 2 provides a review of relevant literature on Agile methods, team archetypes, drivers, barriers, and perceived performance. A clear overview of research gaps is provided. The research design is described in Chapter 3. Chapter 4 will show the results, which will be discussed in Chapter 5. Finally, Chapter 6 concludes the thesis and addresses the theoretical contribution, practical contribution, limitations, and future research and ends with a reflection on the process.

2

Theoretical background

The theoretical background of this research explores various factors impacting the use of Agile methods within local government teams as well as Agile methods in related organisational contexts. The unique challenges faced by local governments show a need for a tailored examination of these methods.

This chapter provides a review of the relevant literature, highlighting key drivers, barriers, methods, and frameworks that underpin the use of Agile practices. It will address the historical context and evolution of Agile methods (Section 2.1), describe the various methods and their adaptations in different organisational settings (Section 2.2), and categorisations of the types of Agile teams based on their characteristics (Section 2.3). Following this, a detailed examination of the drivers and barriers to Agile adoption, particularly within public sector organisations, will be presented (Section 2.4). Finally, measures of performance and satisfaction of Agile methods from a team's perspective will be discussed (section 2.5).

The chapter concludes by reiterating the identified research gaps and establishing a clear link to the research sub-questions (section 2.6). These sub-questions are designed to address the gaps and provide a structured approach to understanding the practical application of Agile methods in local governments.

2.1. History

Understanding the origins of Agile frameworks such as Scrum is essential for grasping their relevance and application in project management. Concepts such as working iteratively, prototyping, adaptive approaches to uncertainty, and involving the customer in the development process have been applied across various industries in the last decade (Whiteley et al., 2021; Rigby et al., 2021). A first step in what is considered Agile methods can be seen in the introduction of Plan-Do-Study-Act cycles in the 1930s.

The Agile Manifesto, introduced in 2001 by Beck et al. (2001), is often seen as the starting point for Agile methods in recent literature. The Agile Manifesto is a concise list of principles that outline Agile methods with a focus on software development teams, brought forward by self-proclaimed ”organisational anarchists” (Fowler et al., 2001, p.32). This Agile manifesto brought forward a united view of what Agile stands for and what its strengths are such as costumer satisfaction, adaptability, frequent product delivery and collaboration. As a result, Agile became widely accepted especially in the field of software development. In contrast to older linear methods such as the Waterfall model, Agile enables faster and more flexible development cycles (Balaji and Murugaiyan, 2012).

With the rise in popularity, several Agile frameworks and methods were developed, notably Scrum, Kanban and hybrid approaches. Research has since then expanded beyond IT to other organisational

contexts (Conforto et al., 2014). In these organisations, Agile methods mostly still originate in the IT department. With more and larger organisations starting to work Agile emerged a need to manage Agile teams as Scrum teams at a larger scale. To meet these demands so-called scaled Agile methods were developed, some wellknown examples are SAFe (Scaled Agile, Inc., 2024b), Scrum@Scale (Sutherland and Scrum.org, 2022) and Nexus (Scrum.org, 2021) the last two being developed by Scrum.org. These frameworks aim to facilitate collaboration and alignment across large projects and in larger organisations. While this research focuses mostly on single project teams, it is relevant to discuss scaled Agile methods as some teams might be part of this context or take inspiration in methods from them.

2.2. Methods

Agile methods encompass a variety of frameworks designed to enhance flexibility, collaboration, and iterative progress in project management. Among these, Scrum, Kanban, and hybrid approaches are most common, each offering unique advantages and challenges. The mentioned Agile project management methods are described in more detail in this section. Research gaps exist in understanding how these methods are adapted and implemented in the context of local government project teams.

Scrum is best explained by consulting the 'Scrum bible' or Scrum guide written by the originators of Scrum, Schwaber and Sutherland (2011). Scrum aims to be a simple Agile framework emphasising generating iterative incremental value generation, based on the underlying values "Commitment, Focus, Openness, Respect and Courage" (Schwaber and Sutherland, 2011, p.7). Scrum operates in sprints, set periods starting with a sprint planning and ending with a sprint review. These sprints enhance structure, focus, flexibility and collaboration, by utilising fixed feedback loops and an incremental process. A Scrum team comprises a small (at most 10 people) self-managing team consisting of a Scrum Master, a Product Owner, and Developers. Herein the Scrum master (SM) serves the team by coaching, supporting, and removing barriers. The Product Owner (PO) manages the product backlog and ensures value creation through clear communication with the team and stakeholders. Communicating and feedback are facilitated through several 'Scrum events' such as sprint review, sprint planning, daily Scrum and sprint retrospective (Schwaber and Sutherland, 2011).

Compared to Scrum, Kanban is a more visual planning framework that promotes a continuous workflow, without structured predefined roles or sprints (Saleh et al., 2019). This workflow is visualised and managed through the Kanban board, displaying tasks divided into to-do, doing and review. Releases in this method depend on the team's discretion. This method allows for more flexibility and responsiveness. This can be an advantage and disadvantage compared to Scrum, which gives more guidance and structure.

Scaled Agile frameworks typically extend a framework such as Scrum to larger projects by involving multiple teams. An example is Scrum@Scale (Sutherland and Scrum.org, 2022), where operating on a larger scale is enabled by adding Scrum of Scrum teams. In its simplest form, one Scrum of Scrum team comprises 5 Scrum teams, functioning as any other Scrum team with daily stand-ups attended by representatives from the Scrum teams. The Scrum of Scrum teams have a PO and SM and create a separate cycle for SMs and POs to coordinate efforts. The strength of this method lies in the possibility to theoretically scale linearly forever. A more integrated version to scale Scrum is Nexus (Scrum.org, 2021). In Nexus 3 to 9 Scrum teams function with a single PO with a single shared backlog from which teams create a single product with a shared vision. The framework is used to define accountability, events and artefacts. This is a less impactful change to the Scrum framework requiring multiple teams to work on the same product.

A different approach is taken in the Scaled Agile Framework(SAFe) (Scaled Agile, Inc., 2024b). SAFe is described as a knowledge base of proven principles. The resulting product is closer to guiding Agile principles rather than a rigid framework. SAFe focuses on 7 core competencies giving a more comprehensive overview of the entire organisation by including factors such as portfolio management and

organisational agility. Teams can still use Scrum or Kanban however, scaled teams in SAFe form a cross-functional Agile Release Train (ART), that delivers within typically 5 iterations. Overseeing supporting roles consist of coaches, product management and architectural guidance. The Element from SAFe that impacts individual teams is the PI planning. In PI plannings, all teams get together for a quarterly planning day to connect, coordinate and create a shared vision between teams.

Some local governments have adopted 'Opgave Gericht Werken' (Goudvisie, 2023) or task-oriented working. This approach takes a few Agile principles to address the difficulties of collaborating on complex social issues involving many parties. This approach focuses on task-focused, user-centric, self-managing teams working in short cycles. A difficulty with this approach is that the customer is not always a clear entity in government contexts.

In practice, many teams don't use an Agile method exactly as described, but instead use a combination of Agile methods and non-Agile methods resulting in a hybrid approach (Gemino et al., 2021). While Agile and hybrid approaches are shown to be more effective than traditional methods, no significant difference in performance was found between hybrid and pure Agile methods.

Scrum has been the most widely used agile method for teams since 2006, according to the latest survey by Digital.ai (2023) 63% of respondents use Scrum. In recent surveys, there has been a decrease in people's satisfaction using Agile methods. There is growing experimentation with hybrid methods, reflecting a trend toward customising Agile frameworks to better meet specific team needs and organisational contexts.

Research gaps

There is a lack of empirical studies on the implementation and impact of Agile frameworks in the public sector, specifically within local governments. Research is needed to understand how these frameworks can be adapted to meet the specific needs of these organisations. The reasons behind the adoption of hybrid methods and their performance compared to pure Agile approaches in local government settings are not welldocumented. There is a need for qualitative research to understand the underlying drivers and barriers to these choices. Understanding these considerations could guide towards reaching more Agile teams in governments.

2.3. Agile team archetypes

To develop a practical framework, it is essential to categorise teams into archetypes. These archetypes represent typical examples of types of Agile teams based on some differentiating characteristics. This way the high dependency of drivers, barriers and solutions on a team's context can be addressed. This section describes methods, archetypes and frameworks to categorise teams from literature. The categorizations described are combined and added on to create dimensions relevant for project teams in local governments in the results chapter.

In literature, Agile teams are often categorised according to the frameworks they use. Comparative studies have focused on the most used frameworks at the time, such as Scrum Kanban and XP (Saleh et al., 2019; Ionel, 2009). However, in this study, a large majority of teams use Scrum. Basing archetypes on the Agile framework would pool nearly all teams in the same archetype if categorised solely by the framework. Additionally, many teams are transitioning from Waterfall to Scrum ending up in what can be called Water-Scrum-Fall (West et al., 2011). A common occurrence in governments, which are usually Waterfall-based organisations. Taking this into account a better approximation can be made by dividing teams into traditional, hybrid and Agile teams (Gemino et al., 2021). While this gives a good basis, this distinction is still too one-dimensional for this research. Causing vastly different teams, with different contexts to end up in the same archetype, making comparison meaningless. A combination of the two previously mentioned methods can be used to categorise based on a combination of an Agile framework and a traditional framework. Taking into account different combinations of hybrid teams. This approach was taken by Papadakis and Tsironis (2018). However, this leads to the same issue of

having most teams end up with a combination of Scrum and Waterfall.

To refine the categorization, different motivations and objectives for adopting and modifying Scrum can be considered. In a study about Scrum adaptation, Hron and Obwegeser (2018) focused on why the method was modified and how. This led to the following 7 motivation categories: “distributed settings, combination with other frameworks or methods, increased focus on UX and usability, vertical scaling, size scaling, tools to use with Scrum, and Scrum in a specific context” (Hron and Obwegeser, 2018, p.5448). In a later paper Hron and Obwegeser (2022) focused on modification objectives to categorise teams. This led to the following modification objectives: Performance, context, architecting, juxtaposition, distributed development, managerial extensions, user experience, size scaling, and security. Following these studies, it can be seen that motivation and objectives are important dimensions in categorising teams.

The government teams in this study are not yet at the stage of scaling, and some of these categories are more focused on IT enterprises than individual teams in governments. Many categories are too technical or dedicated for the IT usage observed in the public organisations in this research. Besides these categories seem to be reasoned from a management perspective. To adapt to this research categories should be chosen representing a team perspective in local governments.

Gemino et al. (2021) highlighted key team and organisational characteristics impacting hybrid team performance, such as top management support and team experience level. These characteristics vary significantly across organisations and are crucial for categorising teams effectively.

Research gaps

There is limited research on the specific archetypes of Agile teams within local governments, particularly regarding how these teams adapt and transition between methods like Water-Scrum-Fall. This gap necessitates a more nuanced categorization beyond simple framework-based distinctions. There is a need to explore the specific motivations and modification objectives of Agile teams in local governments. Existing categorizations often overlook the unique context of public organisations, which can influence the use of Agile methods. Further research is needed to understand how team characteristics, including management support and experience levels, influence the performance and use of Agile methods in local government teams. The following dimensions were identified in literature to use as a basis for team archetypes in a local government context:

- **Framework used:** Distinguishing between different Agile, hybrid and traditional frameworks.
- **Motivation for change:** Identifying the reasons behind adopting or modifying Agile methods.
- **Management support:** Assessing the level of support from management.
- **Team experience level:** Evaluating the experience levels within the team.

2.4. Drivers and barriers

In this section drivers and barriers to the use of Agile methods will be examined. Starting with a general overview and concluding with specific drivers and barriers to teams in governments. The primary objective is to understand the unique challenges and facilitators of Agile use in a local government context. The iterative nature of Agile itself informed the review process. As new drivers and barriers were identified, the literature review was iteratively refined to incorporate emerging insights, reflecting the adaptive and responsive principles of Agile.

A complete overview of drivers and barriers can be found in Tables 2.1 and 2.2. This table was created by summarising all drivers and barriers per source and combining related drivers and barriers. Combining these drivers and barriers takes away some of the detail and context of the studies. The concluding drivers and barriers are higher level and some of them are derived from the advantages and disadvantages of working Agile. The tables will be used to compare findings from interviews in Chapter

5. The most relevant drivers and barriers to teams are discussed in their context in this section.

One of the objectives of this research is to increase the use of Agile methods in local governments. Here the quantity and quality of use are relevant. On one side the number of teams utilising Agile methods and collaborating with other Agile teams should increase on the other hand the maturity and application of teams already using Agile methods could be improved. The choice for the term 'use' was made to focus on teams' Agile practice. In some of the literature discussed below the term adoption is used. This generally addresses integrating Agile practices in a broader sense also taking into account the integration into organisational structures.

There are varying frameworks analysing the transition towards an Agile organisation. The most important factors according to these frameworks can be summarised in 16 factors (Jovanović et al., 2020). organisational culture is the most prevalent factor. Followed by team size, management support, training, budget, team distribution, previous experience, domain knowledge, contract type, organisation maturity level, previous knowledge, communication, project time and customer collaboration. Many drivers and barriers can be seen in these factors. Most of these frameworks focus on large private organisations taking a management perspective and none specifically looked at governmental organisations.

2.4.1. General barriers

Common pitfalls can turn into significant barriers to working Agile (McGregor and Doshi, 2020). These include teams focusing on processes and tools over the individuals and interactions these tools were meant to enhance. This is seen when teams do not critically reflect on their methods. Documentation and requirements according to frameworks and rules can become so intense that they hinder workflow. Additionally, responding to change can be mistaken for not planning ahead, teams should still follow the organisation's strategies.

In the process of becoming more Agile organisations still encounter barriers at later stages (Rigby et al., 2016). A common one is executive-level employees lacking knowledge about Agile methods, leading to older management styles undermining the effect of Agile working teams. Common symptoms are becoming overly involved in the process, setting urgent deadlines, spreading focus and interrupting workflow with meetings. Besides, hand-offs should be avoided as they threaten the need for collaboration, can cause waiting times, and threaten a team's autonomy.

Chan and Thong (2009) created a framework from a knowledge management perspective on the acceptance of Agile methods. Factors influencing acceptance include experience, training, external support, top management support, culture, communication, shared understanding and perceived ease of use. The proposed framework focuses on technical aspects. One social factor mentioned is career consequences. However, this is mostly described as positive opportunities instead of negative consequences.

Agile expert van Solingen (2020) listed the 7 most common pitfalls organisation run into during their Agile transitions. Pitfalls not mentioned before include:

- **No focus on interim results**: The transformation towards Agile is in itself an Agile process. This should be done in small noticeable steps.
- **The why is not measured:** In the process of an Agile transition organisations forget that Agile is not the goal, but the means to reach a goal. This goal should be clearly defined.
- **The impact is heavily underestimated:** An Agile transformation impacts all facets of the organisation, from methodology to culture. This is hard to anticipate and could be addressed by learning from others.
- **The importance of a new rhythm is not understood:** Agile meetings tend to be added as an extra, while it is supposed to be the basis. Agile meetings enable dealing with unexpected

situations. However, too often companies deal with problems ad-hoc disrupting the rhythm and creating more chaos in the process.

2.4.2. General drivers

To prevent common pitfalls related to misunderstanding underlying principles of Agile methods, such as focusing excessively on processes, tools and documentation it is important to critically reflect on the team's process and goal of using Agile frameworks (McGregor and Doshi, 2020). Guidelines for adopting Agile generally emphasis starting small and expanding gradually (Rigby et al., 2016), a good place to start with Agile would be IT teams. Key drivers include aligning teams around a common vision, encouraging collaboration, and fostering a culture of continuous improvement. Motivated individuals drive the success of Agile transformations. Allowing teams to customise their practices and learn from them and presenting their success to other parts of the organisation stimulates adoption. Sharing a common vision greatly enhances the opportunity to collaborate. Getting everyone on the same page is therefore an important requirement for success. Instead of changing team structures it could for example be beneficial to change roles first. It is important to remember that at the core of an Agile organisation are motivated individuals driving the change. To support an Agile transition not only developers and team members but also executive-level employees on their should receive training (Rigby et al., 2016).

Capgemini has released a report providing guidelines towards organisational Agile transformations Morley (2022). Although this report focuses on managerial perspectives lessons can be drawn that could be applied to project teams. Actions such as encouraging candid and open debate, encouraging conversation, celebrating success and acknowledging mistakes positively could be a good starting point for drivers to deal with culture change. Although project teams might not be able to directly change problematic behaviour or bottlenecks coming from leadership, being able to identify them might help to clarify or escalate issues. Thinking of the project team as a minimum viable team that will improve through iterations can improve team learning. Capgemini advices to give 'freedom within a frame'. Allowing teams to experiment and learn, while providing some guiding principles to fall back on.

Table 2.1: Overview of drivers

Driver	Articles	Context
Focus on individuals and interactions	McGregor and Doshi (2020); Mergel (2017)	General Government
Working software over comprehensive documentation	McGregor and Doshi (2020); Mergel (2017)	General Government
Customer collaboration	McGregor and Doshi (2020); Jovanović et al. (2020); Rigby et al. (2016); Mergel (2017); Vacari and Prikladnicki (2015)	General Government Public
Flexibility and adaptability	Jovanović et al. (2020); Dunleavy et al. (2005); Mergel et al. (2018); Eilers et al. (2022)	General Government
Enhanced communication and teamwork	Jovanović et al. (2020); Rigby et al. (2016); Chan and Thong (2009); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Ribeiro and Domingues (2018); Wisitpongphan and Khampachua (2016); Vacari and Prikladnicki (2015); Mergel (2017)	General Team Focus Public Government
Previous experience	Jovanović et al. (2020); Mergel et al. (2018)	General Government
Highly competent people	Jovanović et al. (2020); Mergel et al. (2018); Dunleavy et al. (2005)	Government General
Training	Jovanović et al. (2020); Rigby et al. (2016); Vijayasarathy and Turk (2012); Dunleavy et al. (2005)	General Government
Multidisciplinary teams	Rigby et al. (2016)	General

Driver	Articles	Context
Autonomy for teams	Rigby et al. (2016); Stray et al. (2018)	General Team Focus
Continuous improvement (step-by-step)	Rigby et al. (2016); van Solingen (2020); Mergel (2017)	General Government
High motivation	Rigby et al. (2016); Eilers et al. (2022); Vacari and Prikladnicki (2015); Mergel (2017)	General Public Government Mindset
Knowledge sharing	Chan and Thong (2009); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016)	General Team Focus Public
Management support	Chan and Thong (2009); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Vacari and Prikladnicki (2015); Mergel (2017)	General Team Focus Public Government
Career advancement opportunities	Chan and Thong (2009)	General
Alignment with organisational strategy	van Solingen (2020); Morley (2022); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016)	General Team Focus Public
Critical reflection on methods	McGregor and Doshi (2020); van Solingen (2020); Eilers et al. (2022); Riemenschneider et al. (2002)	General Mindset
Open communication	Morley (2022); Eilers et al. (2022)	General Mindset
Deliver value to customers/stakeholders earlier	Wisitpongphan and Khampachua (2016); Vacari and Prikladnicki (2015)	Public
User engagement	Wisitpongphan and Khampachua (2016)	Public
High demands on digitization and user experience	Mergel et al. (2018)	Government
Increased demands on accountability and transparency	Mergel et al. (2018); Dunleavy et al. (2005)	Government
Encouraging innovation	Wilson and Mergel (2022)	Government
Promoting success	Morley (2022); Wilson and Mergel (2022)	General Government
Attitude towards learning spirit	Eilers et al. (2022)	Mindset
Attitude towards collaborative exchange	Eilers et al. (2022)	Mindset
Attitude toward empowered self-guidance	Eilers et al. (2022)	Mindset
Attitude towards customer co-creation	Eilers et al. (2022)	Mindset
Job satisfaction	Vacari and Prikladnicki (2015)	Public
Alignment between IT and business objectives	Vacari and Prikladnicki (2015)	Public
Promoting champions	Vijayasarathy and Turk (2012); Wilson and Mergel (2022)	Government

Nerur et al. (2005) focus on organisational culture and management style. Drivers found through this

lens are highly competent people, customer relationships and people working effectively in a team. Vijayasarathy and Turk (2012) have shown that for software developers training and the influence of important individuals are primary drivers for the use of methods. Perceived benefits and drivers are not significant. However, in the case that barriers are experienced the perceived benefits do become a significant driver for the use of Agile methods.

Riemenschneider et al. (2002) looked into the acceptance of individual developers using five theoretical models, ranging from technical acceptance to behaviour. This study was driven by individuals' resistance to new methods. They found that adoption is driven by organisational mandates, compatibility of the methods with work, and opinions of coworkers and supervisors.

2.4.3. Barriers on a team level

Research about barriers to autonomous teams has been done in the field of software (Stray et al., 2018). As autonomous teams are what many Agile methods are striving for this is relevant. These barriers include a lack of clear goals, trust, coaching, and organisational support, as well as too many dependencies and diversity in norms.

A comparison between developers, testers, project managers and users was made by Ghobadi and Mathiassen (2016). They compared these perspectives on several barriers: team diversity, team perception, team capabilities, project communication, project organisation, project settings and technology barriers. Project managers emphasised project-setting barriers, such as budget, legacy systems and cultural issues. Developers and testers emphasis communication and project organisation barriers such as planning, documentation, multitasking and decision-making.

2.4.4. The effects of a Waterfall organisation

West et al. (2011) describes the state of an incomplete transition from Waterfall to Scrum as Water-Scrum-Fall. This is a common occurrence in public and government organisations. This does not have to be a problem but risks potential pitfalls on a team level. Business analysts are often assigned as product owners. This is fine in theory, however, in practice these business analysts don't usually have decision-making authority or capability. They lack technical experience and need to report to business owners, slowing down the process.

Another issue is the lack of focus. Individuals are often spread over many projects or even multiple teams. This makes it hard for teams to collaborate and for individuals to get uninterrupted work done. Additionally, not all tasks can be done in a sprint as teams deal with dependencies and constraints from the non-Agile organisation. Rapid feedback loops for Agile teams are not realised in this way. A related issue is traditional funding. organisations often require upfront plans to enable funding, this impedes the flexibility of a team and requires effort for specific planning that is often subject to change and in vain. Finally, artefacts of the project culture can be seen. Teams are often still brought together on a project basis, not enabling these teams to build team capabilities, losing momentum and flow.

2.4.5. Drivers and barriers in public organisations

Public organisations face many similar challenges such as documentation, education or experience, communication and role set-up (Nuottila et al., 2016). Additionally, public organisations face specific challenges, such as legislative constraints, complex legacy systems, and bureaucratic resistance to change (Nuottila et al., 2016; Ribeiro and Domingues, 2018; Wisitpongphan and Khampachua, 2016). When dealing with procurement or openness public organisations might face additional legislation that can limit their flexibility in working methods. Additionally, large public organisations typically end up with complex IT systems being developed by several teams, resulting in technical debt or increased costs for maintenance and development (Nerur et al., 2005). Public organisations typically face a more bureaucratic structure with greater resistance to change from middle and top management (Ribeiro and Domingues, 2018). Additionally, Wisitpongphan and Khampachua (2016) found a lack of involvement from end-users and a lack of flexibility in integrating requirements during project development. Besides they also found procurement as a major barrier. Despite added challenges, Wisitpongphan and

Khampachua (2016) found that certain Agile methods can still improve the overall process, customer satisfaction and performance in public organisations.

Vacari and Prikladnicki (2015) highlighted the importance of pilot projects and champions in public organisations. They found that processes to adopt Agile tend to be slower and more complex, emphasising the need for consistent efforts and behaviour of leadership to drive the Agile transition. The underlying reasons are lacking experience in public organisations and many hierarchical layers.

2.4.6. Drivers and barriers in governments

Governments, as public organisations also deal with complex IT systems being developed by different teams (Nuottila et al., 2016). Governments traditionally didn't have internal developer teams making this barrier more prevalent due to partially outsourced IT tasks.

The demand for digitization and improved user experience drives the need for Agile methods, which offer improved task clarity and flexibility (Mergel et al., 2018). As mentioned earlier another important driver is highly competent people. However, in government organisations, this can turn into a larger barrier. Government organisations are increasingly relying on external sources to get highly skilled labour (Dunleavy et al., 2005). It is challenging for governments to find capacity for IT talent or experienced individuals at both the team level and the management level (Mergel, 2017). The external employees usually support for shorter timeframes making knowledge transfer and knowledge preservation more difficult. Longterm plans and vision are required to deal with acquiring resources, handling different ways of budgeting as well as increasing budgets.

One of the reasons the use of Agile methods is more difficult in governments boils down to an accountability paradox (Jos and Tompkins, 2004; Baxter et al., 2023). Existing project management is built to manage public resources in a responsible and accountable manner however, this process is slow and tedious and doesn't keep up with the more demanding context. Eventually, this management style leads to lower project success rates. So handling resources in an accountable and responsible manner can lead to wasteful results. Traditional governance methods focusing on accountability and stability, conflict with adaptive governance (Janssen and Van Der Voort, 2016; Ylinen, 2021) and in term also with Agile methods within governments. To address this a change in management style and hierarchy is required, which can lead to friction.

Digital champions, individuals that actively support ideas, technologies or strategies, can be key factors in driving cultural and structural change within an organisation (Wilson and Mergel, 2022). Some key barriers like lack of commitment and lack of decision-making and support from the organisation can be effectively addressed through digital champions supported by the organisation.

Table 2.2: Overview of barriers

Barrier	Articles	Context
Overemphasis on processes and tools	McGregor and Doshi (2020); van Solingen (2020)	General
Documentation overload	McGregor and Doshi (2020); Mergel et al. (2018)	General Government
Lack of collaboration	McGregor and Doshi (2020); Nerur et al. (2005); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Ribeiro and Domingues (2018)	General Team Focus Public
Outdated management styles	McGregor and Doshi (2020); Vacari and Prikladnicki (2015); Rigby et al. (2016); West et al. (2011)	General Public Government

Barrier	Articles	Context
Resistance to change	McGregor and Doshi (2020); Jovanović et al. (2020); Chan and Thong (2009); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015); Wisitpongphan and Khampachua (2016); West et al. (2011)	General Team Focus Public Government
Lack of management support	Jovanović et al. (2020); Chan and Thong (2009); van Solingen (2020); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015); West et al. (2011)	General Team Focus Public Government
Lack of knowledge in management	Rigby et al. (2016); Jovanović et al. (2020); Chan and Thong (2009); van Solingen (2020); Morley (2022); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016); Ribeiro and Domingues (2018); Vacari and Prikladnicki (2015); West et al. (2011)	General Team Focus Public Government
Inadequate training and education	Jovanović et al. (2020); Chan and Thong (2009); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015); West et al. (2011)	General Team Focus Public Government
organisational culture misalignment	Jovanović et al. (2020); Chan and Thong (2009); Nerur et al. (2005); Vijayasarathy and Turk (2012); van Solingen (2020); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015)	General Team Focus Public Government
Insufficient customer involvement	Jovanović et al. (2020); Wisitpongphan and Khampachua (2016)	General Public
Lack of skilled practitioners	Rigby et al. (2016); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Mergel et al. (2018); Vacari and Prikladnicki (2015); West et al. (2011)	General Team Focus Public Government
Difficulty scaling agile	Rigby et al. (2016); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015)	General Team Focus Public Government
Career risks	Chan and Thong (2009)	General
Underestimating transformation impact	van Solingen (2020)	General
Fear of failure	van Solingen (2020)	General
Big Bang Deliveries	Vacari and Prikladnicki (2015); van Solingen (2020)	Public General
Accountability paradox	Jos and Tompkins (2004); Baxter et al. (2023)	Government
Legislation	West et al. (2011); Nuottila et al. (2016); Wisitpongphan and Khampachua (2016); Ribeiro and Domingues (2018)	Public Government
Focus on stability and accountability	Mergel et al. (2018); Janssen and Van Der Voort (2016); Ylinen (2021)	Government

Barrier	Articles	Context
Increased complexity of digital systems	Dunleavy et al. (2005); Nuottila et al. (2016); Wisitpongphan and Khampachua (2016); Ribeiro and Domingues (2018)	Government
Insufficient funding (for IT infrastructure)	Jovanović et al. (2020); Dunleavy et al. (2005); Mergel et al. (2017); Nuottila et al. (2016); West et al. (2011)	Public Government
Lack of clear leadership and vision	McGregor and Doshi (2020); van Solingen (2020); Wilson and Mergel (2022)	General Government
Siloed organisational structures	Nuottila et al. (2016); Wilson and Mergel (2022)	Public Government
Lack of agile mindset	Stray et al. (2018); Eilers et al. (2022)	General Team Focus
Relying on external resources	Nuottila et al. (2016); Mergel et al. (2018); Dunleavy et al. (2005)	Government
Lack of focus for teams (inexperienced POs)	West et al. (2011)	Government

Research gaps

While these drivers and barriers are well-documented in private sector contexts, their applicability and effectiveness in local governments require further study. There is a need for research that examines how these drivers and barriers affect the specific sociotechnical environments of local government organisations. Numerous drivers and barriers are mentioned in the literature, but there is a lack of practical frameworks to stimulate the use of Agile methods from a team perspective in local governments. This gap highlights the need for research that provides actionable insights and frameworks tailored to public sector teams. Research is needed to explore the longterm barriers faced by local government teams and how continuous training and collaboration practices can address these issues. Further research is needed to understand how Agile methods can be effectively scaled within governmental structures and what specific adaptations are required to overcome the unique challenges in this context. In previously described cases studies are mostly done on either enforced or already accepted methods. A perspective from teams that have rejected a new method is scarce and could provide more insights.

2.5. Satisfaction and performance

Satisfaction and performance in Agile teams are critical metrics that reflect the effectiveness of Agile methods. This section explores how these metrics can be measured, the factors influencing them, and the research gaps in understanding their impact on local government teams.

Agile and Hybrid methods outperform traditional methods in stakeholder success while keeping the quality of work at least the same, but there is no significant difference in performance between Agile and Hybrid methods (Gemino et al., 2021). In this research, the stakeholder success was defined as the stakeholder's, client's and sponsor's satisfaction.

A large-scale quantitative study reported increased performance when using Agile practices in terms of time, budget, scope and stakeholder satisfaction(Serrador and Pinto, 2015). This study added to the previous definition of stakeholder success with end-user satisfaction. The effect of stakeholder success is reported to be moderated by vision and goals. While some quantitative research and reports have been made to describe the preference and performance of Agile methods against Hybrid methods(Gemino et al., 2021). Research involving questionnaires focuses on managerial functions and their opinions (Capgemini research institute, 2019; Digital.ai, 2023). The increase in performance in these surveys is defined as the reported increase in collaboration, alignment and product quality.

Chan and Thong (2009) did comparative case study research into the acceptance of development teams and brought forward a framework to support empirical research from a knowledge management

perspective. Acceptance impacts the use of a method and can influence the performance as well. Factors that determine acceptance also involve factors relevant to teams, such as perceived usefulness and ease of use based on the TAM (Technology Acceptance Model) framework (Overhage et al., 2011). Training, experience, voluntariness, teamwork, result demonstrability and communication are important factors that can be strongly influenced on a team level.

Success factors can happen despite technical achievements not being met. Tessem (2018) showed a case where low completion of requirements still can lead to high customer satisfaction. In this case, the involvement and open communication with the customer lead to satisfaction, resulting in a continuation of the methods despite not reaching prior requirements. Resistance to Agile methods such as Scrum can show in development teams, partly due to failed attempts in the past.

2.5.1. Agile mindset

The paper by Eilers et al. (2022) describes the Agile mindset, consisting of attitude towards learning spirit, attitude towards collaborative exchange, attitude towards empowered self-guidance and attitude towards customer co-creation. Some relevant factors for individuals and teams that indicate an Agile mindset are being open to learning and experimenting, sharing and collaborative people, willingness to change and reflect and customer focus. The research has shown that this Agile mindset has a positive effect on organisational performance mediated by strategic agility.

2.5.2. Collaboration

People and teamwork are some of the most important factors that make an Agile team function. So, it is important to consider what enables collaboration and what the effects are. San Martín-Rodríguez et al. (2005) show many determinants of successful collaboration. Positive effects include understanding, awareness of contribution, openness, physical proximity, group discussions, communication, and common goals. Negative effects include power differences, different values, and experience. These determinants can help critically reflect and discuss collaboration during interviews. Defining trust can be a difficult task, but for the purpose of this study, we will talk about interpersonal trust as the belief that others will not harm your interest. Dodgson (1993) argues that at the core of successful collaboration is interpersonal trust. Collaboration is often done with the goal of learning, which is facilitated by trust. Furthermore, the research suggests that interpersonal trust requires interorganisational trust, in the case of collaborating externally. Lusher et al. (2014) find a relation between trust and performance in their study of sports teams. Furthermore, competition is a common driver of conflict and inhibition of trust within a team. To examine the level of trust and collaboration within teams it might be useful to ask about trust-generating and trust-inhibiting mechanics such as team-building activities, mood, conflict, competition and relationships between internal and external employees.

Research gaps

There is a need for empirical studies examining how specific Agile practices influence satisfaction and performance in local government teams. Most research addresses performance and satisfaction through the lens of stakeholders or end-users. How teams perceive the methods can affect their use greatly. Understanding these dynamics can help tailor Agile methods to better fit a team's needs and capabilities. Further research is needed to develop robust, context-specific tools for measuring satisfaction and performance in local government Agile teams. Such tools should account for the unique challenges and constraints of the public sector.

2.6. Addressing research gaps

In this chapter several gaps have been identified, these gaps have led to the formulation of three sub-questions as well as the main research question. The main focus of the research was to provide a practical framework for teams in local governments, thus addressing research gap 1. In doing so a basis and preliminary explanations for many other research gaps have been brought forward. This can serve to inspire future research. Table 2.2 shows an overview of the research gaps and how they are addressed. A more detailed explanation per sub-question follows below.

The research question: **"How can project teams in local governments stimulate the use of Agile methods?"** was developed over several iterations to address research gaps 1 and 2. The research provides a contribution by developing an Agile team advancement framework from the perspective of Agile teams in local governments. Additionally, it provides first steps in addressing the scaling of Agile methods within governments. Research gap 3 signals a general need for more empirical knowledge about Agile in local governments, to which this research contributes.

To compare types of teams and develop a more generally usable framework within local governments, it is imperative to categorise teams based on their characteristics. After exploring previous categorisations from literature, it became apparent a more nuanced categorization was required. The following sub-question was asked: **"What team archetypes represent the typical use of Agile methods in local governments?"** Answering this provides a framework for categorization of local government teams and address research gap 4. While not the focus in this research this categorization gives some examples and dimensions to addresses research gap 5 and 6. Additionally, the resulting archetypes provide a basis for answering the following sub-questions and main research questions of this research.

The bulk of the information collected to provide guidance and practical steps for improvement came from considering drivers and barriers to different type of teams. **What barriers and drivers towards the use of Agile methods are experienced by the teams?** In comparing the results from this question with literature, research gap 8 is addressed. Combining the barriers from sub-question 2 with the reason to change from sub-question 1 can give insight into research gap 7.

To address the final research gaps found in 9 and 10, an effort was made to look into the perceived performance of Agile methods from a teams perspective. **How do different types of (Agile) team management impact the perceived performance by team members?** By evaluating ways of measuring how perceived performance is related in literature and measuring responses based on this it became clear that a more robust tool for measuring satisfaction in this specific context is required.

Nr	Research gap	Related to question
1	There is a lack of practical frameworks to stimulate the use of Agile methods from a team perspective in local governments.	RQ
2	Further research is needed to understand how Agile methods can be effectively scaled within governmental structures and what specific adaptations are required to overcome the unique challenges in this context.	RQ
3	There is a lack of empirical studies on the implementation and impact of Agile frameworks in the public sector, specifically within local governments.	RQ, 1, 2, 3
4	There is limited research on the specific archetypes of Agile teams within local governments, a more nuanced categorization beyond simple framework-based distinctions is required.	1
5	There is a need to explore the specific motivations and modification objectives of Agile teams in local governments.	1
6	Further research is needed to understand how team characteristics, including management support and experience levels, influence the performance and use of Agile methods in local government teams	1, 3
7	There is a need for qualitative research to understand the underlying drivers and barriers to choosing a hybrid approach over a pure Agile approach.	1, 2
8	There is a need for research that examines how drivers and barriers from private sector contexts affect the specific sociotechnical environments of local government organisations.	2
9	There is a need for empirical studies examining how specific Agile practices influence satisfaction and performance in local government teams.	3

10	Further research is needed to develop robust, context-specific tools for measuring satisfaction and performance in local government Agile teams.	3

Table 2.3: Summary of research gaps

3

Methodology

This chapter outlines the research methodology used to investigate the use of Agile methods within local government project teams. The approach is qualitative and explorative, focusing on understanding and insights rather than quantitative measurement. This approach was selected to provide a basis for further research in a relatively underexplored area, as was made clear in Chapter 2. This chapter describes the research design, data collection methods, the context of the teams involved, the context of the interviews, and the motivation for the chosen methods.

3.1. Research design

The research consists of 2 main phases: Data collection and data analysis. To collect data on how Agile methods are used within local governments the study utilises a qualitative case study approach (Yin, 2018). This approach helps to gain a deeper understanding of the specific context and factors affecting daily work for Agile teams. A diverse range of experiences is collected through interviews by focusing on teams with varying characteristics from three local government organisations in the Netherlands. To provide a systematic way to analyse the large amount of complex qualitative data in the form of transcripts and notes a thematic analysis approach was adopted (Cruzes and Dyba, 2011). This method allowed the completion of the following steps in an organised matter: familiarisation with the data, generating initial codes, finding and defining themes, reviewing themes, and producing a concluding framework.

Data collection for this study primarily involves semi-structured interviews, literature reviews, questionnaires, expert reviews and observation notes. These methods provide a comprehensive understanding of the research context and validate data from different sources.

Ethical considerations

Ensuring ethical integrity is essential for maintaining the trust and cooperation of participants. It also upholds the credibility and reliability of the research findings. This research was done per the guidelines developed by the TU Delft HREC committee, accessible online[1]. All participants to interviews and questionnaires gave informed consent to their response data being recorded and are free to withdraw from the study at any point.

3.1.1. Research sample

The study involves multiple local government project teams from three local government organisations in the Netherlands. Respectively 8 (Provincie Zuid-Holland), 5 (Gemeente Den Haag) and 2 (Gemeente Rotterdam) teams per organisation were selected. Teams were selected based on availability and purposive sampling. To ensure a comprehensive understanding, the research includes a variety of teams differing in size, organisational context, and Agile maturity. Team sizes range from 3 to 13 people, most teams consist of 8 or 9 people. Except for 2 teams, all teams consist of developers working on one

[1] https://www.tudelft.nl/strategie/integriteitsbeleid/human-research-ethics

or more digital products. The 2 exceptions are one team consisting of developers and a business part and one team being involved in project management but not doing development. One representative person per team was interviewed based on seniority and knowledge of the team's process. Different roles were interviewed half of them were SMs for one or multiple teams, most of them working as part-time SMs and part-time developers or business analysts. Other roles were business analysts, POs and product managers. This diverse range of perspectives ensures a holistic understanding of Agile use. The teams from Gemeente Den Haag were examined in a single interview with their shared SM.

To get more insights into the opinions of team members, a questionnaire was sent out to the 8 participating teams within Provincie Zuid-Holland, a total sample consisting of 63 people (including interviewees). In some cases team members can be part of several teams, however, the questionnaire should still provide different insights based on the team's context. Out of these 63 people about half filled in the questionnaire (N= 29). The final sample of teams can be seen in Table 3.1, the team names were anonymised.

Team (anonymized)	Abbreviation
Provincie Zuid-Holland 1	PZH1
Provincie Zuid-Holland 2	PZH2
Provincie Zuid-Holland 3	PZH3
Provincie Zuid-Holland 4	PZH4
Provincie Zuid-Holland 5	PZH5
Provincie Zuid-Holland 6	PZH6
Provincie Zuid-Holland 7	PZH7
Provincie Zuid-Holland 8	PZH8
Gemeente Den Haag 1	DH1
Gemeente Den Haag 2	DH2
Gemeente Den Haag 3	DH3
Gemeente Den Haag 4	DH4
Gemeente Den Haag 5	DH5
Gemeente Rotterdam 1	R1
Gemeente Rotterdam 2	R2

Table 3.1: Teams Sample

3.2. Data collection methods

Data collection for this study primarily involves semi-structured interviews, literature reviews, questionnaires, expert reviews and observation notes. The main source of data will be the interviews. Transcripts from the interviews will be coded to answer the sub-questions in this research. Literature and observation notes will be used to inform the approach and questions for the interviews and questionnaire. The questionnaire serves to give more insight into individual team members' opinions, which will be utilised in answering sub-question 3. Finally, the resulting data from interviews will be verified with questionnaire results. The exact approach and purpose per data source will be described in this section.

Semi-structured interviews

The main source of data collection used in this research is semi-structured interviews with the team representatives. The interviews aim to determine types of team management, reasons for using Agile methods, advantages and disadvantages, collaborative effects, and why not more is being done. Semi-structured interviews are particularly effective for finding underlying drivers, barriers and values as they allow for in-depth exploration of participants' perspectives.

An interview protocol was created following the sub-questions, recommendations from the literature and notes from observations. The acceptance framework by Chan and Thong (2009) was used as inspiration for questions. The TAM framework (Technology Acceptance Model) with the added relevance of FOMO (Fear of Missing out) was consulted to critically infer the reason to use Agile methods (Gartner

et al., 2022). The last 7 questions on the effects of team building, competition, conflict, and mood are based on the literature on collaboration as discussed in the theoretical background (Dodgson, 1993; Lusher et al., 2014; San Martín-Rodríguez et al., 2005). Finally, perceived performance and perceived use were explored in the interview (Venkatesh and Bala, 2008). The interview protocol can be found in Appendix A.

Literature

The initial literature search began with broad search terms related to Agile methods and their application in local government project management. As more was learned about the specific challenges and practices within these areas through experience and result analysis, the search terms were refined to focus on particular aspects that came forward in the context of this study such as hybrid Agile methods, specific drivers and barriers, perceived performance, and a team's perspective. Backward snowballing focused on the most frequently cited studies allowed uncovering key contributions to the related fields. Additionally, consulting advisors and experts in the field gave good direction into potentially underexplored areas.

To deal with time constraints, the literature review was strategically focused on identifying key drivers, barriers, and other factors relevant to the use of Agile in local governments, rather than conducting an exhaustive review of all literature related to Agile methods. This approach allowed the focus on collecting and analysing data from practical applications within the context of the study and addressing the gap between theory and practice.

Questionnaire

At a later point in the study, a questionnaire was sent out to the team members in Provincie Zuid-Holland, allowing validation and confirmation of the preliminary findings from the interviews. A second goal of the questionnaire is to determine the teams' perceived performance of (Agile) methods. Based on the literature (Gemino et al., 2021; Serrador and Pinto, 2015) and taking a team perspective performance is defined as perceived usefulness, perceived ease of use, and perceived project success.

The initial response rate was low with approximately 10% of people answering. This could be attributed to the vacation period; after repeated requests, the response rate increased significantly with a reported response rate of 55%, however only 46% finished the entire questionnaire (N=29). Participants were asked to rate their opinions in closed questions and open questions. Questions were based on the TAM (Technology Acceptance Model) model adjusted for IT teams (Overhage et al., 2011), combined with team factors from the acceptance model by Chan and Thong (2009). These models describe the effect of perceived usefulness and perceived ease of use on adoption. Based on this, opinions were evaluated about individuals, team members, and the organisation. Results from the questionnaires were compared between archetypes to determine if there is a difference in perceived performance. The questionnaire can be found in Appendix C.

Several questions were used to confirm found barriers and drivers, such as difficulty focusing and lack of alignment. Special attention was given to the Agile mindset. As drivers were seen to largely correspond to factors belonging to the Agile mindset as described by Eilers et al. (2022). Based on questions asked in the research by Eilers et al. (2022) in combination with found drivers, questions were formulated to confirm the availability of an Agile mindset for team members. Open questions were asked to make sure no important barriers or drivers were missed during interviews. A final question was asked to determine how resistance in management is perceived.

Observation

Participant observation is conducted during Agile team meetings at the Provincie Zuid-Holland. This observation is naturalistic, unstructured, and both participatory and non-participatory, allowing the researcher to observe the practical application of Agile methods. Additionally, documentation such as sprint retrospectives, sprint plannings and project reports will be consulted. The data following this observation will be notes to support and validate the findings of the research. Furthermore, initial observation of the teams' way of working and their effectiveness will be used to prepare more tailored questions for both the interviews and questionnaires.

3.3. Data analysis

The collected data was analysed using a comparative and a thematic analysis approach(Cruzes and Dyba, 2011). Using this approach the sub-questions (repeated below) are answered. The collected data is used to deduct archetypes based on the different teams' Agile methods (sub-question 1), identify and compare drivers and barriers per archetype (sub-questions 2), and determine the perceived performance of the methods per archetype (sub-question 3). The results of these sub-questions are combined to create an Agile team advancement framework with which teams in local governments can stimulate the adoption of Agile methods within their organisation.

1. What team archetypes represent the typical use of Agile methods in local governments?
2. What barriers and drivers towards the use of Agile methods are experienced by the teams?
3. How do different types of (Agile) team management impact the perceived performance by team members?

Team archetpyes

To create team archetypes fitting local governments, interview transcripts per team were deductively coded based on literature as discussed in the background (Hron and Obwegeser, 2018, 2022; Gemino et al., 2021). The dimensions that were used as categories are: Framework, Reason to change, Team experience and Management support. A more detailed description of these categories and the resulting archetypes is found in the results section. The resulting archetypes support answering the other sub-questions by providing categories to compare.

Drivers and Barriers

To find drivers and barriers, transcripts were individually deductively coded again. Categories used are current barriers, past barriers, and drivers. The barriers and drivers are purely towards working more Agile. For example, in the case of traditional teams, the fact that the project scope is clear would be a barrier towards the use of Agile methods. A distinction is made between current and past barriers to account for barriers that might have turned into drivers by addressing them. Relevant quotes per team from the deductive coding phase can be found in Appendix B; duplicate or similar quotes were removed.

After deductive coding, axial coding was applied to find barriers and drivers per archetype. Barriers and drivers occurring in all archetypes were placed under shared drivers and barriers. Barriers and drivers that were deemed unique circumstances for a team were put under 'uniques'. These unique drivers and barriers were separated to ensure archetypes represent typical drivers and barriers and not special circumstances. The drivers and barriers are compared with the literature in the discussion section. Afterwards, questionnaires were used to confirm some of the most important drivers and barriers.

Perceived performance

The perceived performance was evaluated in the questionnaire (found in Appendix C) defined as perceived usefulness, perceived ease of use, and perceived project success. To determine perceived usefulness Q5 and Q10 were asked (questions below). Q9 indicates perceived ease of use and Q16 addresses perceived project success. Serrador and Pinto (2015) shows that stakeholder satisfaction is moderated by vision and goals. Since common barriers involve a lack of vision Q20 was added to determine if there might be a similar effect. Riemenschneider et al. (2002) mentions organisational mandates can stimulate adoption in the case of resistance from the team. Barriers from interviews included a lack of alignment. Q23 and Q24 are added to determine if alignment affects individuals' resistance. Questions were evaluated by comparing bar graphs and metrics such as STD and average scores, based on a 5-point Likert scale. Results from the questionnaire are shown in the results section and differences between archetypes are discussed in the discussion section.

- Q5: I find the way our team works satisfying.
- Q9: Working with the current method is easy for me.
- Q10: I see added value in the current method.
- Q16: Our team achieves more success with this way of working.

- Q20: The organisation has a clear vision.
- Q23: There is good alignment on approach within the organisation.
- Q24: More alignment among teams could improve the effectiveness of our approach.

Agile team advancement framework

To answer the research question: **How can project teams in local governments stimulate the use of Agile methods?** An Agile team advancement framework was created. Results from sub-questions were used to place the different archetypes in order to guide teams from less mature to more mature Agile teams. The most important barriers and drivers at each stage were compared and synthesised into guiding principles. The final results were validated with expert reviews.

3.4. Research design limitations

Efforts were made to validate results through the use of multiple data sources and expert reviews. However, the research design is still highly contextual and the external validity will be lower as a result. To make results more generalisable teams from different local governments in the Netherlands were interviewed. The results should still be verified in a more diverse and larger sample before applying them in different contexts.

Sampling on availability might create a bias towards organisational barriers specifically in Provincie Zuid-Holland where most of the teams are working. Furthermore, teams might be more willing to share positive results over negative results, this might mean that teams with a positive attitude towards Agile are more likely to participate. Finally, a lack of experience in related fields and time constraints may have led to missing some key information in the literature, although mitigated by consulting with experts.

4

Results

This chapter presents the findings from the data collected through semi-structured interviews, and questionnaires. The results are organised according to the research questions outlined in the introduction, ending with the Agile team advancement framework developed to address the main research question. The discussion of these results can be found in the next chapter.

4.1. Agile team archetypes

This section presents the team archetypes identified within local government settings, based on the findings from the research. Answering the question: **What team archetypes represent the typical use of Agile methods in local governments?** These archetypes represent typical examples of types of Agile teams based on certain characteristics.

Literature shows that project teams typically show growth in stages (Ito and Brotheridge, 2008). With this in mind, a focus was placed on creating archetypes that show a step wise increment in Agile maturity. It should be noted, however, that the ability to grow still depends on how previous barriers are addressed. The dependencies between archetypes mean that archetypes should be interpreted as indications of progress and not a checklist.

Categorisations found in the literature were too narrow to make a proper distinction between teams in the local government context. Combining multiple dimensions from literature and adjusting them to the context allowed to divide teams into archetypes. The analysis revealed seven distinct archetypes characterised by four specific dimensions: The agile framework used, the reason to change, the team's experience level, and the level of management support. The dimensions on which the archetypes are based are explained below.

Framework

The framework dimension represents the framework that teams are using. A distinction is made based on the strategies seen in literature (Saleh et al., 2019; Ionel, 2009; Gemino et al., 2021) and available frameworks seen during observation. Since a combination of Waterfall and Scrum is quite common in governments this was also added as a framework (West et al., 2011). The resulting frameworks are: Scrum, Traditional(Waterfall), Kanban, Water-Scrum-Fall, SAFE elements. Transcripts are deductively coded based on these categories. Archetypes were primarily split on framework since this fundamentally changes the team's working methods.

Reason to change

Motivation to change and modification objectives greatly infleunces how teams are working, even within certain frameworks (Hron and Obwegeser, 2018, 2022). Based on this observation the second dimension is motivation to change. The literature showed several categories, most of them didn't fit the specific context for local governments. To deal with this new categories were created. This was done

through open coding the interviews based on the reason to change and comparing these codes to earlier motivations from literature. The resulting categories are adaptability, structure, experimenting, ownership, openness, rebuilding, hype, bridging, alignment, flow and management. Teams with these codes found a need to change to reach a certain goal. Management refers to management telling teams to work Agile. Rebuilding refers to teams rebuilding their product, this is the only motivation found to not work Agile. Bridging refers to connecting the business and developer teams. Finally, hype refers to applying Agile since it is popular right now. The difference between bridging and alignment is that bridging refers to bridging the gap between business and IT, while alignment refers to aligning teams with similar functions and goals.

Team experience

For team experience(Gemino et al., 2021) there are 2 important aspects, represented by their own column in the resulting table. One is the amount of time the teams have worked Agile together, measured in years. This indicates not only experience with Agile but also the presence of team capabilities. The second is the experience in key roles such as SM or PM. Measured according to the following scale: 1 new (just started), 2 theoretical (had training, but limited experience), 3 junior (1-4 years' experience), 4 expert (multiple years of experience within different key roles). Transcripts were deductively coded based on these codes.

Management support

From the literature, it was apparent that management support could be a big factor in how a team can work Gemino et al. (2021). This is especially relevant since the teams in this research are from different organisations. Inductive coding was used to come up with categories. Based on interview questions common responses to management revolved around: resisting change, lack of knowledge, lack of commitment/decisions, freedom to experiment, and complete commitment. A second round of coding was done based on these categories, assigning them values 1 to 5 accordingly.

4.1.1. Resulting team archetypes

Table 4.1 shows the resulting values for each characteristic per team (A table with corresponding quotes can be found in Appendix D). From the table, groupings were made based on similar values, and linear increments in Agile maturity. After multiple iterations, the final approach taken resulting in a good representation of differences between teams was as follows. First teams were filtered based on using different methods than Scrum or SAFE. This resulted in 2 archetypes Kanban and Traditional. Afterwards, teams with full management commitment were grouped into a corresponding archetype. Teams with very low experience were put in the beginning teams archetype. Next based on the reason for change PZH6 was put in a bridging archetype. The remaining Scrum teams were differentiated on commitment from MT. The resulting archetypes are described below. The colours in Table 4.1 show the factors on which teams were grouped to the corresponding archetype as shown in the legend (Table 4.2).

Traditional teams (PZH4 & DH1)

This archetype represents teams who don't work Agile. In the case of this research, these teams have paused their Agile practices while rebuilding their product. In this rebuilding phase the direction, customer needs and scope are clear. The deadline was set and many advantages of using Agile could therefore not be fully utilised. In both cases, these teams kept some ceremonies for structure such as periodic STUMS.

Beginning teams (PZH2)

The beginning teams archetype describes teams who just started working or experimenting with Agile. Their key characteristic is having little experience in key roles such as SMs and POs and having worked Agile together for less than a year.

Kanban teams (DH3)

This archetype represents teams working according to the Kanban framework. Although there was only one team in the sample, there were teams considering moving towards Kanban (PZH5) from Scrum to deal with service requests and create a continuous workflow. A Kanban team could be at

Team	Framework	Reason	Exp 1	Exp 2	Management
PZH1	Water-Scrum-Fall	Adaptability/structure	1	3	1/2/3/4
PZH2	Scrum	Experimenting/Structure	0	1	2/4
PZH3	Scrum	Ownership/Openness	4	4	1/2/4
PZH4	Traditional	Rebuilding	2	2	2/5
PZH5	Scrum	Hype	5	4	2/3/4
PZH6	Scrum	Bridging	4	2	2/4
PZH7	Scrum	Hype/External	5	4	1/2/3/4
PZH8	Water-Scrum-Fall	Adaptability	4	2	1/2/3/4
DH1	Traditional	Management/Rebuilding	3	4	5
DH2	Scrum	Management/Alignment	3	4	5
DH3	Kanban	Management/Flow	3	4	5
DH4	SAFE elements	Management/Alignment	2	4	5
DH5	SAFE elements	Management/Alignment	2	4	5
R1	Water-Scrum-Fall	Management/Fast software	2	3	1/2/4
R2	Water-Scrum-Fall	Management/Fast software	1	3	1/2/4

Table 4.1: Team comparison

	Traditional teams
	Beginning teams
	Kanban teams
	Lack of commitment and knowledge in organisation teams
	Lack of knowledge in organisation teams
	Management commitment & expertise teams
	Bridging teams

Table 4.2: Color legend team archetypes

the same level as other archetypes in terms of experience and management support. It is taken as a separate archetype to highlight the difference in working method and focus on workflow over structure and sprints.

Lack of commitment and knowledge in organisation (PZH1, PZH5, PZH7, PZH8)

This archetype describes teams that have some experience with working Agile, but have issues with commitment or lack of responsibility/decision-making from management. These teams have a drive and will to improve blocked by conditions not being met in the organisation.

Lack of knowledge in organisation (PZH3, R1, R2)

This archetype is different from the previous one by having some commitment within the organisation. These teams have a department manager or similar role committed to Agile, resulting in some alignment for these teams. While there is some alignment and commitment there is still a lack of knowledge blocking further progression. This lack of knowledge is combined with resistance from upper/middle management to change.

Management commitment & Expertise (DH2, DH4, DH5)

The teams in this archetype have full organisational support and commitment in their Agile journey. In comparison to the other teams from the sample, these teams also have the most experienced people in key roles. This has everything to do with an organisation committed to acquiring and training its employees. In this case, the teams are all from Gemeente Den Haag, where they have a transition team and Agile coaches to actively support the Agile transition. These teams all have the same dedicated Scrum master. In this research sample, this archetype is the one to strive for, however, the teams in this archetype are far from done. Their conditions to improve are mostly met, but it will take a lot of time and practice to complete their Agile transition.

Bridging teams (PZH6)

PZH 6 was taken placed its own archetype. This team is unique as can be seen from the motivation. This team consists of a business and a development team working together. The focus of their methodology therefore lies on bridging the gap between business and development teams. This is currently being addressed by assigning a business side PO to learn the Agile way of working. This team found a unique chance within the context of local governments to effectively bridge this gap, resulting in enthusiastic users. This can be partly attributed to having a champion actively promoting the Agile way of working to his colleagues.

The archetypes can serve as a basis for answering the other sub-questions and the main research questions. Besides it provides a basis for further research in the context of Agile teams within local governments.

4.2. Drivers and barriers

This section presents underlying barriers and drivers that can block or catalyse the use of Agile methods per archetype. In doing so the second sub-question is answered: **What barriers and drivers towards the use of Agile methods are experienced by the teams?**

Quotes from initial deductive coding (can be found in Appendix C) were summarised and compared across teams to come up with uniform barriers and drivers. The final drivers and barriers are grouped per archetype and can be found in the tables below. Codes occurring in all archetypes are grouped under shared drivers and barriers. Codes that are highly contextual relating to a team's unique situation, and thus not relating to the archetype, are grouped in 'uniques'. This is done to ensure drivers, barriers and eventual guidance will be relevant for teams falling within a particular archetype. Green markings highlight the most relevant drivers and barriers for each archetype, based on a comparison to other archetypes and notes from the interviews. A description of the most important drivers and barriers is added for each archetype. A discussion comparing to drivers and barriers found in literature can be found in Chapter 5.

	General drivers and barriers mentioned by teams in this archetype
	Drivers and barriers most relevant to this archetype

Table 4.3: Color legend drivers and barriers

Traditional teams (PZH4 & DH1)

What defines these teams is that they carefully consider if the Agile methods would work for them. When there is a clear direction, a clear value, a predetermined scope and no prioritising required, there is no need to implement a framework that allows to deal with uncertainty and customer feedback. As van Solingen (2020) explains Agile is not a solution to everything, as it is best suited for complex situations that cannot be planned in advance.

Interviewees mention that trying to work Agile (Scrum) in this situation just makes work unnecessarily difficult "If you have to build something big, then data warehousing is quite difficult to make Agile". These teams came to the sensible decision to stop following the Scrum framework for a while while focusing on rebuilding their product. In this process, they were able to fully commit to the project. Both teams do keep some recurring meetings such as STUMS and occasional retrospectives to keep the structure and improve and discuss team dynamics. Which is a driver to easily continue the Agile method when rebuilding is done.

Beginning teams (PZH2)

The biggest barrier to beginning teams is a lack of experience, both in key roles and team members. This causes teams to misunderstand processes or underlying values, causing them to no realise the potential of an Agile method. An example is when an interviewee comments on the reason why they are working Agile: "Because the deadline was already decided it seemed like a good idea". Beginning

Drivers	Barriers
Critical reflection on method	Clear direction
Full-time product commitment	Clear value
Management leads by example	Large tasks
	No prioritising required
	Predetermined scope

Table 4.4: Traditional Teams (PZH4 & DH1)

teams need training or coaching to get up to a good start. In this case, one of the mentioned drivers was basic team training, which gave some support in the form of an introduction to the Scrum guide (Schwaber and Sutherland, 2011). This training provides structure to the teams, which is one of the most important drivers for using an Agile framework for beginning teams. The freedom to experiment for these teams is a double-edged sword as it can also mean a lack of support and guidance.

Drivers	Barriers
Basic team training	Absence of Agile guidelines
Freedom to experiment	Consistency issues
Similar to previous method	Key roles experience deficiency
Structure	Lacking external commitment
	Misunderstanding framework
	Team experience deficiency

Table 4.5: Beginning Teams (PZH2)

Kanban teams (DH3)

The team working Kanban (GRAVES et al., 1995) and the teams who were considering switching to Kanban have one important factor in common: dealing with service-based processes. For example, maintenance teams who work Scrum would have to wait for the next sprint before adding new work. This can heavily delay service processes. In an extreme case, one interviewee experienced this: ”I’ve had a firewall request on which I had to wait almost 3 to 4 months before it was finally handled”. Allowing for more flexibility and flow comes at the cost of structure that frameworks such as Scrum provide. This is a reason some of the teams who tried Kanban switched back to Scrum as the tasks became unmanageable, especially in government organisations where there is often a lack of focus. As a result service based processes is both on the driver and barriers side for Kanban teams.

Drivers	Barriers
Dedicated Agile coaching	Competence-based teams
Management leads by example	Hierarchical time management
Service-based processes	No direct contact with user
Shared SM	Overinvolved management
Transition team	Service based processes

Table 4.6: Kanban Teams (DH 3)

Lack of commitment and knowledge in organisation (PZH1, PZH5, PZH7, PZH8)

The barriers that define this archetype the most is lack of commitment, ownership and vision from management. This results, according to the teams, in a lack of alignment and capacity as it is made hard to hire roles that are not known or seen as important by the organisation. Additionally, the organisations in these cases are mostly still working Waterfall forcing Agile teams to work in a not Agile context, which brings issues with expected deadlines West et al. (2011). Since there is limited management support teams are forced to take a bottom-up approach to Agile adoption. These teams run the risk of not always critically reflecting on their methods, this can be seen in focusing too much on processes and tools or disregarding longterm vision and documentation completely. One interviewee mentioned: ”People have completely stopped documenting, with the excuse we’re working Agile”. These pitfalls

are confirmed in literature as wellMcGregor and Doshi (2020).

Drivers	Barriers
Freedom to experiment	Absence of Agile guidelines
Structure	Inadequate documentation
Multi-disciplinary team	Lack of Agile knowledge in organisation
Need for change in method	Lack of alignment between teams
Team experience	Lack of commitment in management
	Lack of involvement from business teams
	Lack of ownership in management
	Lacking capacity
	Lacking vision in management
	No critical reflection on method
	No sprint interjections
	Resistance to change
	Top heavy complex hierarchy
	Unclear PO roles
	Waterfall management

Table 4.7: Lack of Commitment and Knowledge in organisation (PZH1, PZH5, PZH7, PZH8)

Lack of knowledge in organisation (PZH3, R1, R2)

In comparison to the previous archetype, this archetype shows some management support. There is often some commitment to working Agile, usually from an IT department. This creates alignment for teams and stimulates collaboration and a shared vision. This can lead to a shared approach trying to deal with typical issues that are hard to solve as a single team such as having to focus on several projects at the same time. However, the organisation typically still lacks the experience to effectively transition to Agile. Key roles such as PO are usually done by business analyst who don't have a lot of knowledge about Agile working or what is required West et al. (2011). This causes confusion in role definitions. Not knowing what is required, can cause ineffective communication from management. Many people can end up having PO roles, making it hard for teams to focus while having to maintain several backlogs and directions.

Drivers	Barriers
Key role alignment	Waterfall management
Creating focus per sprint (80/20)	Lack of Agile knowledge in organisation
Department commitment	Multiple backlogs
Freedom to experiment	Unclear PO roles
Method fits activities	Ineffective management communication
POs from business	POs from business
Sharing success	Resistance to change
Stimulated safety and trust	
Team experience	
UX designers for user validation	

Table 4.8: Lack of Knowledge in organisation (PZH3, R1, R2)

Management commitment & Expertise (DH2, DH4, DH5)

The management for teams in this archetype is fully committed to working Agile and most importantly assigned a transition team. This transition team can guide the Agile transition step by step, by providing coaching and setting examples. The teams experience more alignment by having shared Scrum

masters and shared meetings such as PI plannings and Scrum master guild meetings.

The drawback for teams with full management commitment can be that management is also deciding on an execution level what direction teams should take. This can undermine teams becoming autonomous and responsive and can cause decisions to be made without experts' input. The teams, in this case, are still competency based and time frames are still managed by upper management.

Drivers	Barriers
Dedicated Agile coaching	Competence-based teams
Dedicated key roles	Hierarchical time management
Management leads by example	Overinvolved management
Shared SM	Part-time SM
Transition team	

Table 4.9: Management Commitment & Expertise (DH2, DH4, DH5)

Bridging teams (PZH6)

Bridging teams are an example of teams adapting to challenges and conditions of working within a government. Specifically, one where there is no full support towards an Agile transition. This team consists of both an IT and business side. The driving force behind this type of team is bringing these 2 sides together, which is done through a cross-functional PO. A PO with knowledge from business supported by a technical PO and following training in Agile working called a champion. The champion, in this case, followed a training which was "unfortunately too general to deal with my specific responsibilities as a PO". This is being compensated by a close collaboration with a technical lead within the development team. Digital champions can also effectively increase commitment from management as they are often highly visible individuals or in closer contact with management.

Drivers	Barriers
Closeness to business	Absence of Agile guidelines
Cross-Functional PO	Bridge between business and IT
Faster communication	Business champions required
Forced to trust	Different methodology tech and business
Freedom to experiment	Lacking commitment stakeholders
Key role training	Basic key role training
PO not technically involved	Waterfall management
Sharing success	

Table 4.10: Bridging Team (PZH 6)

Uniques

These drivers and barriers are specific to a team context and therefore don't represent an archetype. For example, PZH7 is in the unique situation of having a fulltime SM, who hired a personal Agile coach, while not having full organisational commitment. PZH3 is a team created as a reaction to the realisation that a new way of working was required. DH1 and R1 are dealing with relatively large teams, which could be split up to improve focus. To explain unexpected findings and improve the reproducibility of this study it is essential to denote these edge cases.

Shared

The most mentioned problem by all teams with varying earnestness is a lack of dedicated POs. In most cases, this has to do with awareness and knowledge from management. This is also one of the reasons for a lack of focus. Teams are being required to work on many different projects at the same time for sometimes different POs. The role of PO is not clearly defined within governments, meaning it is hard to assign proper POs. In practise POs without Agile knowledge or training are selected from

Drivers	Barriers
Full-time SM (PZH7)	Difficult to define acceptance criteria (PZH1)
High performance team (R1)	Difficulty to receive feedback (PZH4)
Involved users (PZH4)	Large team (DH1 R1)
Private agile coaching (PZH7)	No development (PZH1)
Specialized customer-driven (PZH4)	No shared stories (PZH1)
Team creation based on method (PZH3)	Online team (PZH5)
Visibility and acceptance (PZH5)	Ineffective management communication (PZH4)
	POs hard to reach (PZH4)
	Too fast for business teams (PZH1)

Table 4.11: Uniques (Various Teams)

the business side to be a mix between business analyst and PO. All teams report as drivers motivated individuals, willing to help and collaborate, and with an improving mindset. All drivers focus on cultural aspects on a team or personal level. People are at the centre of Agile methods. As one interviewee summarised: ”The key success factors in a project are generally not if you put the right method but if you use the right people in the right place in the right way”. People are also a recurring barrier in most teams. Teams call it having the right capacity in their team, many teams indicate issues with acquiring the right people for key roles.

Drivers	Barriers
Collaborating people	Decisions by non-technical managers
Improving mindset (process)	Lack of focus
Motivated people	No dedicated PO’s
Open communication	PO’s requiring official decision-making power
Willingness to help	Responsible and deliberate governments
	Slow layered processes

Table 4.12: Shared (Common Across Various Teams)

4.3. Perceived performance

To compare how team members experience working with (Agile) methods the following question was asked: **How do different types of teams experience perceived performance of their (Agile) methods?** To answer this question a questionnaire was sent to the team members of Provincie Zuid-Holland. In this questionnaire, several questions were asked to determine the perceived performance (Questionnaire can be found in appendix-c).

- Q5: I find the way our team works satisfying.
- Q9: Working with the current method is easy for me.
- Q10: I see added value in the current method.
- Q16: Our team achieves more success with this way of working.
- Q20: The organisation has a clear vision.
- Q23: There is good alignment on approach within the organisation.
- Q24: More alignment among teams could improve the effectiveness of our approach.

The perceived performance was determined based on several aspects. In the literature, performance

is often measured by success experience from several parties (Gemino et al., 2021; Serrador and Pinto, 2015). Besides product quality is important. To determine a team's perceived success the TAM framework is consulted (Overhage et al., 2011). In this research, perceived performance is defined as perceived usefulness, perceived ease of use and perceived project success. To determine perceived usefulness Q5 and Q10 were asked. Q9 indicates perceived ease of use and Q16 addresses perceived project success. Serrador and Pinto (2015) shows that stakeholder satisfaction is moderated by vision and goals, since common barriers involve a lack of vision Q20 was added to determine if there might be a similar effect. Riemenschneider et al. (2002) mentions organisational mandates can stimulate adoption in the case of resistance from the team. Barriers from interviews included a lack of alignment. Q23 and Q24 are added to determine if alignment affects individuals' resistance.

4.3.1. Survey results

Table 4.13 shows the standard deviation, mean, min and max scores per question. The median outcome per question is shown as the median opinion. Aside from questions 20 and 23 responses show agreement on the question with relatively low STD. Questions 20 and 23 show less consensus. Within these questions, no clear difference between team archetypes could be found partly because answers are equally distributed per archetype, and partly because not all archetypes are represented in the questionnaire. The lack of commitment and knowledge in organisation archetype represented half of the questionnaire responses whereas the other archetypes all had less than 5 responses, 2 archetypes were not shown at all since their teams are not part of Provincie Zuid-Holland.

Question	Min	Max	Mean	STD	Median Opinion
Q5	1	4	2.04	0.81	Somewhat agree
Q9	1	4	2.12	0.75	Somewhat agree
Q10	1	4	1.85	0.77	Somewhat agree
Q16	1	4	2.04	0.82	Somewhat agree
Q20	1	5	3.44	1.30	Neither agree nor disagree
Q23	2	5	3.64	1.05	Somewhat disagree
Q24	1	3	1.76	0.71	Somewhat agree

Table 4.13: Questionnaire Metrics

Results from Q5 and Q10 (figure 1) show a team members all see added value and experience satisfaction from their working method, except for a response from PZH1. On average the teams seem to see the value and usefulness of their working method.

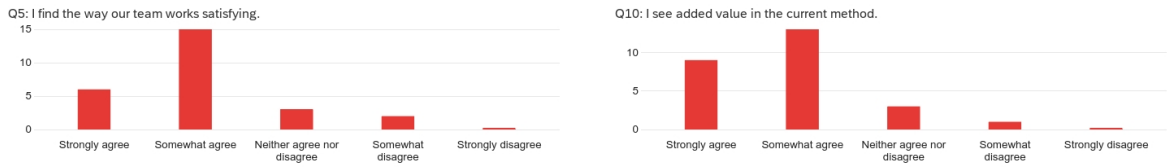

Figure 4.1: Q5 and Q10 results

Q9 (figure 2) confirms that most team members experience their working method as somewhat easy to use. Meanwhile, q16 shows that most team members feel that their way of working does not negatively contribute to their success, except for responses from PZH1.

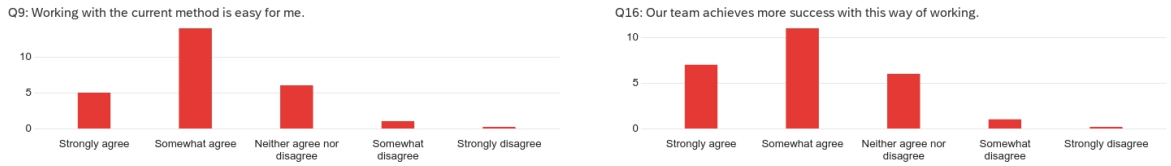

Figure 4.2: Q9 and Q16 results

Q20 (figure 3) shows that while the majority feels there is a strong lack of vision in the organisation a large part of respondents feel the organisation has a somewhat clear vision.

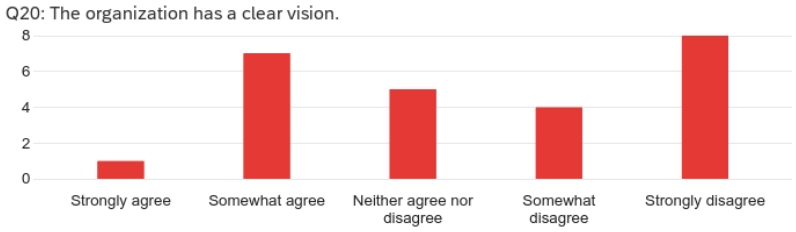

Figure 4.3: Q20 results

While Q23 (figure 4) shows that not everyone experiences a lack of alignment, Q24 shows that almost everyone sees room for improvement in this aspect.

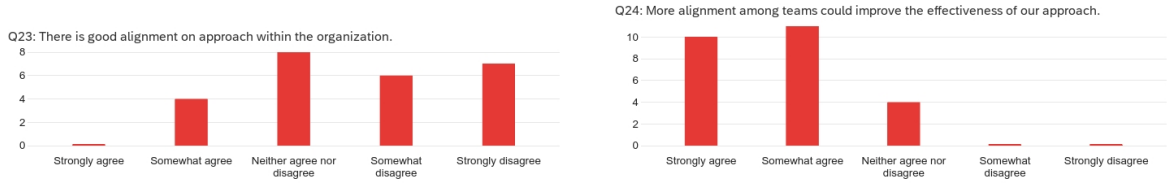

Figure 4.4: Q23 and Q24 results

4.4. Agile team advancement framework

Using the defined archetypes and drivers and barriers from sub-questions the research question: **How can project teams in local governments stimulate the use of Agile methods?** can be addressed. To help teams stimulate the use of Agile methods an Agile team advancement framework was developed (Figure 4.5). Rolling out Agile within a traditional organisation takes time and a big bang approach generally has negative effects (Vacari and Prikladnicki, 2015). The recommendation is to start small (Rigby et al., 2016). Starting in IT teams and expanding from there. For this framework, small steps are enabled by guiding teams from one archetype to another. The purpose of the framework is to be practically applicable to teams in local governments in any typical situation based on the team archetypes. The framework shows typical progression, with guiding principles to focus on for that stage of the progression. The guiding principles are based on barriers and drivers between archetypes compared to the literature as well as observations and notes from interviews. The final model can be seen below. Teams can move according to one of 4 lines: typical progression, traditional pause, Kanban progression and bridging progression. These lines are explained with guiding principles (Table 4.14).

4.4.1. Components explained

The Agile team advancement framework shows 7 blocks containing the 7 team archetypes as discussed in sub-questions 1. Here LCKO, LKO and MCE stand for Lack of commitment and knowledge organisation, Lack of knowledge organisation and Management commitment & knowledge respectively. Arrows indicate possible moves from one archetype to another. The middle row shows a typical progression towards increasing the use of Agile methods. On the right side, the typical reason to move in the direction of the arrow is denoted. The striped arrows indicate there are certain special conditions as explained in the bridging teams section below. The green arrows indicate a path that can only be taken backwards or forwards to the same block you came from. Finally, the blocks on the top and bottom hold guiding principles to progress per archetype. The Guiding principle blocks for LCKO and LKO teams have a striped border as there is an overlap between their guiding principles.

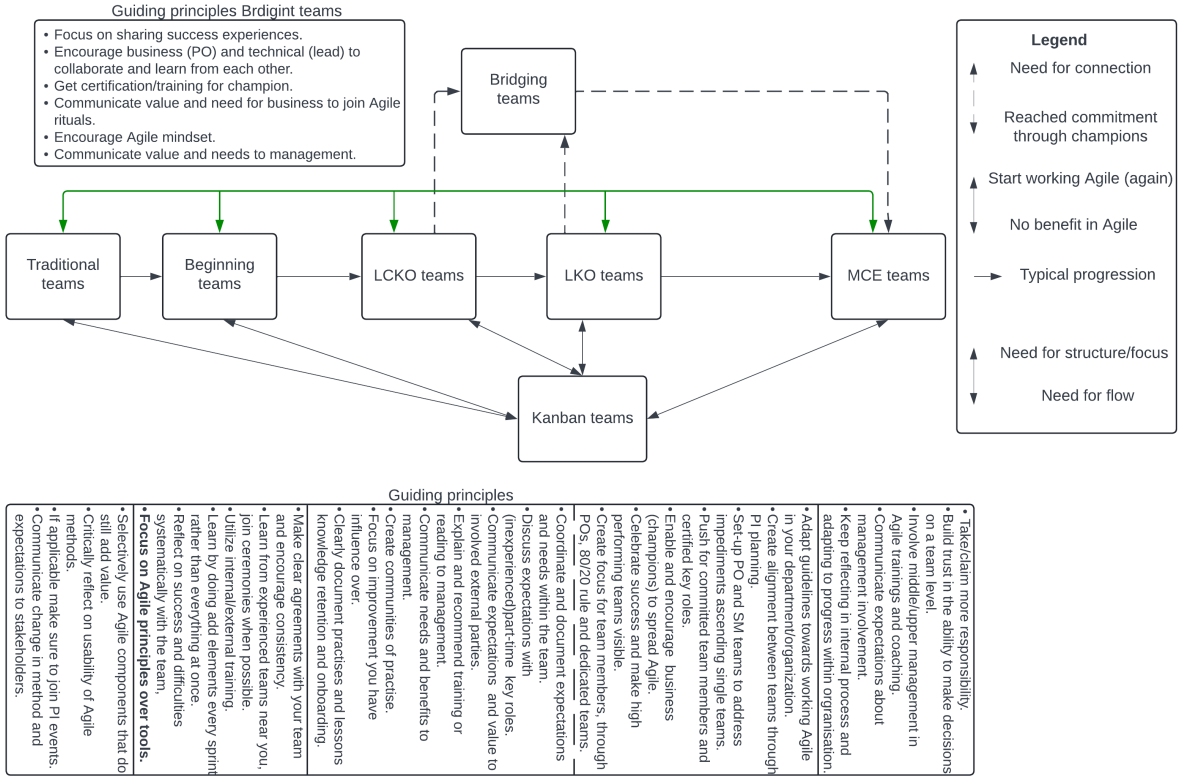

Figure 4.5: Agile team advancement framework

4.4.2. Typical progression

The typical progression can be seen in the middle horizontal line of blocks. The distance between blocks indicates the difficulty and time it takes to go from one archetype to the next. The guiding principles below show what to focus on per archetype to effectively increase the use of Agile methods. Guiding principles between LCKO and LKO teams have overlap.

The primary barrier for beginning teams is a lack of experience. This should be addressed with internal or external training and coaching. organisational guidelines to work Agile could provide support and a place to start. A recurring issue is consistency in beginning teams. To address this teams should make clear agreements and hold each other to these agreements. Teams should systematically reflect on their processes, for example in a sprint retrospective. Every sprint small process improvements should be realised.

A core issue that needs to be addressed by LCKO teams is documentation. Clear documentation of practices, knowledge and needs allows easier communication. This can improve coordination within the team as well as collaboration outside the team. Specifically communicating with stakeholders, key roles, management, and other teams can stimulate commitment from these parties. This can be combined with recommending training and sharing knowledge about Agile methods and their value. It is important to keep focused on aspects the teams can influence. To extend the influence teams could set up communities of practice with teams working in similar ways. These communities can share knowledge and address shared issues.

LKO teams should continue focusing on the alignment of teams and departments. This can be done through setting up PI planning events. Guidelines on how to work Agile within the department's context improve not only the alignment of teams but also help beginning teams to advance faster. For issues that cannot be handled within a team, teams of POs and SMs could be set up. This requires some

commitment in key roles, in the case that this is not yet achieved this need should be made clear to management. Besides communicating needs, it helps significantly to communicate success and improve the visibility of high-performing teams and digital champions. Finally, team members should be able to focus, this can be ensured by having dedicated trained POs, creating teams dedicated to certain products, or focusing on one product per sprint (for example with the 80/20 rule).

Having reached full commitment from management is the final step in this model. This block represents a situation in which teams and the organisation are prepared to undergo the Agile transition. While the organisations adapt, teams should constantly keep reflecting on how to improve their process. At this point, management usually still doesn't have the acquired knowledge to effectively manage an Agile organisation. A common pitfall is overinvolvement from management. Management might want to decide on technical decisions they are not trained to make or might want to be kept up to date in an unnecessary number of meetings. The agile meetings should be the basis, on which even unexpected issues can be addressed in a structured manner, management reacting ad-hoc to this disrupts the rhythm (van Solingen, 2020). To address these pitfalls the expected role and support from managers should be communicated by teams. Trust should be built between managers and teams through project success and open communication. In this process teams should take more responsibility from managers, eventually becoming autonomous teams.

Table 4.14: Guiding principles

Guiding Principles
Management commitment & expertise teams
Take/claim more responsibility.
Build trust in the ability to make decisions on a team level.
Involve middle/upper management in Agile trainings and coaching.
Communicate expectations about management involvement.
Keep reflecting on internal processes and adapting to progress within the organisation.
Lack of knowledge in organisation teams
Adapt guidelines towards working Agile in your department/organization.
Create alignment between teams through PI planning.
Set-up PO and SM teams to address impediments ascending single teams.
Push for committed team members and certified key roles.
Enable and encourage business champions to spread Agile.
Celebrate success and make high performing teams visible.
Create focus for team members, through POs, 80/20 rule and dedicated teams.
Lack of commitment and knowledge in organisation teams
Coordinate and document expectations and needs within the team.
Discuss expectations with (inexperienced) part-time key roles.
Communicate expectations and value to involved external parties.
Explain and recommend training or reading to management.
Communicate needs and benefits to management.
Create communities of practice.
Focus on improvement you have influence over.
Clearly document practices and lessons for knowledge retention and onboarding.
Beginning teams
Make clear agreements with your team and encourage consistency.
Learn from experienced teams near you, and join ceremonies when possible.
Utilise internal/external training.
Learn by doing, add elements every sprint rather than everything at once.
Reflect on success and difficulties systematically with the team.
Focus on Agile principles over tools.
Traditional teams
Selectively use Agile components that still add value.
Critically reflect on the usability of Agile methods.
If applicable, make sure to join PI events.

Table 4.14: Guiding principles

Guiding Principles
Communicate change in method and expectations to stakeholders.
Bridging teams
Focus on sharing success experiences.
Encourage business (PO) and technical (lead) to collaborate and learn from each other.
Get certification/training for champion.
Communicate value and need for business to join Agile rituals.
Encourage Agile mindset.
Communicate value and needs to management.

4.4.3. Traditional pause

The only arrows going backwards in the progression towards the use of Agile methods are the green arrows going towards traditional teams. Teams can at any point stop working Agile. When having stopped working Agile teams don't lose their experience or organisational context. So these teams can move back to the archetype they came from at any point.

It is recommended that traditional teams keep critically reflecting and use only aspects of Agile that still add some value for the teams. Besides it is recommended to still participate in department wide planning events such as the PI planning if applicable to keep alignment with the teams. The change in method should be clearly communicated to stakeholders.

4.4.4. Kanban progression

Teams can theoretically switch from Scrum to Kanban and back anytime. Teams starting to work Agile can also start by implementing Kanban. Typically, teams would switch from Kanban to Scrum when there is a need for more structure and focus, or customer engagement. Scrum gives more tools to help create focus and consistency for the team, especially if a PO gets assigned. Additionally, Scrum provides tools to effectively engage customers and receive feedback and validation.

Teams who work Scrum and switch to Kanban need more flow in their tasks. Working in sprints might be too restrictive for some teams, the most common example is teams dealing with service requests (and typically working on one product). Scrum doesn't allow for sprint interjection and prioritisation within a sprint. Meaning teams dealing with many service requests might cause unnecessary time delays. Kanban teams can refer to guiding principles of archetypes corresponding to their maturity level from the typical progression line.

4.4.5. Bridging progression

Teams can progress towards bridging teams to address a gap between business and IT teams. In this case, you are usually connecting two different working methodologies. The IT teams work Agile, and the business teams typically work Waterfall. This progression can provide an accelerated path towards management commitment, which is a difficult step for LKO teams.

Two requirements have to be met. Firstly, there needs to be a situation for an experienced Agile team (LCKO, LKO or Kanban) and a business team to work together. Second, a champion is required. This is a person typically a (new) PO from the business side actively promoting and investing time into learning and using the Agile method and spreading this to his team. This champion does not necessarily need to have technical knowledge or knowledge of Agile.

Guiding principles focus on exploiting visibility and success experiences to spread Agile towards the business side and management. Champions are in a position to share success experiences and communicate the Agile principles to business teams and management. It is important to enable and support the champions with training and collaboration with technical leads or representatives from the IT side.

5

Discussion

This chapter discusses the implications of the findings presented in the previous chapter. It connects the results to the existing literature and addresses the sub-questions in detail. The discussion will be presented in the same structure as the results, per sub-question and ending with the research question.

5.1. Archetypes

In the theoretical background chapter, a research gap was identified regarding the categorization of (Agile) teams in local governments. A one-dimensional categorization does not do justice to the level of nuance required to differentiate the teams in this research. To address this issue categorization strategies from the literature were combined and adapted to create the 4 categories as discussed in the results chapter.

- **Framework used:** Distinguishing between different Agile, hybrid and traditional frameworks.
- **Motivation for change:** Identifying the reasons behind adopting or modifying Agile methods.
- **Management support:** Assessing the level of support from management.
- **Team experience level:** Evaluating the experience levels within the team.

From previous approaches, the used framework seemed to be the most important difference between teams (Saleh et al., 2019; Ionel, 2009; Gemino et al., 2021), however within local governments by far most teams were using either Scrum or Water-Scrum-Fall (West et al., 2011). Although more had to be included, it proved an important starting point to separate teams based on the framework first, as this contributed to a large difference in the working method. Following introduction meetings with interviewees it became apparent that there was a large difference in experience levels and the effect of management. Gemino et al. (2021) shows that these are two important aspects to consider, by incorporating these dimensions teams were able to be split based on management support and experience. The drivers and barriers per archetype have confirmed that these dimensions have a large impact on the context of these archetypes. A modification objective was shown to be an important aspect of differentiating teams within large public IT-based organisations (Hron and Obwegeser, 2018, 2022). The final dimension that was added based on this research is motivation to change. The categories used for this dimension extend the original categories using answers from interviews to fit better with local governments.

Combining all these dimensions allowed the creation of archetypes that can accurately represent the different types of teams working Agile in local governments for this study. It should be noted that a large part of the nuance comes from most teams working in different ways with the Scrum framework. 5 Of the 7 resulting archetypes are a variation of Scrum maturity with some extent of management support. This approach can serve as a basis for further research into Agile teams in local governments when there is also a preference for Scrum or Water-Scrum-Fall like methods. Further research

is needed to validate this approach in different local governments, for example outside the Netherlands.

It should be noted that although teams are all assigned to one archetype, it is theoretically possible to fit some teams in multiple archetypes. For example, PZH4 is both beginning and traditional. And DH3 is both a Kanban team and has full management support. In these cases, the researcher decided on which characteristic defined these teams most, based on observation and notes from the interview. This occurrence could be addressed by adding more detailed categories, however, this would complicate the resulting framework and compromise its usefulness. The final selection of 7 archetypes was deemed to represent teams accurately while maintaining practical usefulness.

In the research sample, the conscious choice was made to not exclude any teams in the case of outliers or exceptional cases. This resulted in increased complexity by adding more archetypes, but also a more accurate representation of the teams. The Kanban teams archetype in particular was created to address the larger difference in working methods between teams using Kanban and Scrum. A choice was made to include this as a separate archetype to highlight the possibility of dealing with service requests and workflow and simultaneously make sure the different working methods didn't influence found drivers and barriers for scrum teams. Kanban teams could be technically defined on their level of experience and management support to fit in the other archetypes.

The context of the research and participants introduce a bias through the codes for categories. This can be seen for example in some less critical people saying they work according to Scrum, while more critical people would say it is currently not possible to work according to Scrum. So they work Water-Scrum-Fall. Even though these teams work virtually the same. A similar thing can be seen in PZH4 experiencing full management support, while teams with the same management don't feel that. Note that less critical teams seem more likely to answer they are working completely according to Scrum. The resulting archetypes may be overfitted to the specific context of the organisations involved. To be able to use this approach more generally a larger sample size representing different organisational contexts should be explored. An attempt was made to nullify this bias by verifying with individual team members through the questionnaires, however, the sample size here was too low to have a significant effect.

The categorization shows interesting trends that could be further investigated in future research. Teams with less experience seem to notice fewer barriers from management, which could be explained by the fact they are not experienced enough. Teams facing a lack of commitment from management start their Agile working methods by following a hype. This might be explained by these teams having a clear bottom-up approach to spreading Agile within their organisation. Teams that face a lack of support or knowledge from management tend to experience a lot of freedom to experiment. This most likely has to do with a lack of guidelines or rules allowing teams to work however they want. There could be a tradeoff between freedom and alignment with other teams in the organisation. Interestingly teams that report this freedom to experiment all follow a Scrum framework, while teams with full organisational support and guidelines (the teams from The Hague) have the most diverse working methods. In a report on Agile transitions Capgemini research institute (2019) advice is to give "freedom within a frame", by giving teams freedom to do what they want within certain limits. This provides some guidance to rely on and alignment between teams.

Finally, it should be noted that the archetypes function as an indication of a team's Agile maturity. So that teams can more easily be compared and teams can identify similar teams and issues to find guidance. The discussed points in this section indicate a lack of clear borders between archetypes. In complex organisations such as governments, this gives some flexibility, but it does not give guarantees. The resulting comparisons and framework should therefore always be considered in its context.

5.2. Drivers and barriers

In this section, the key drivers and barriers to Agile use as identified in the literature will be compared with the findings from this study. This comparison will highlight the unique team perspective of this research in the context of local government teams. The overview tables created in the theoretical background chapter will be used to match similar drivers and barriers from the results chapter. Afterwards, missing and important factors will be discussed within their context.

5.2.1. Comparing drivers

Table 5.1 shows the drivers as discussed in the theoretical background (Including references in Appendix E). The second column shows drivers found in the study (from interviews and questionnaires) that correspond to them. Some drivers have several drives related to them. Meaning that drivers in the rightmost column confirm the drivers in the leftmost column for the context of local government teams.

Table 5.1: Comparison of drivers

Driver from literature	**Drivers from research**
Focus on individuals and interactions	Main drivers about people with Agile mindset
Working software over comprehensive documentation	
Customer collaboration	
Flexibility and adaptability	Freedom to experiment
Enhanced communication and teamwork	Shared SM Transition team Key role alignment Department commitment Stimulated safety and trust Faster communication Forced to trust Collaborating people
Previous experience	Similar to previous method Team experience
Highly competent people	Team experience Dedicated key roles
Training	Basic team training Dedicated Agile coaching Transition team
Multidisciplinary teams	Multi-disciplinary team
Autonomy for teams	Freedom to experiment
Continuous improvement (step-by-step)	Transition team Improving mindset (process)
High motivation	Motivated people
Knowledge sharing	Shared SM Team experience Key role alignment Department commitment Faster communication
Management support	Management leads by example Transition team Department commitment
Career advancement opportunities	
Alignment with organisational strategy	Structure Transition team Key role alignment Department commitment

Critical reflection on methods	Critical reflection on methods Method fits activities
Open communication	Stimulated safety and trust Open communication
Deliver value to customers/stakeholders earlier	UX designers for user validation Faster communication
User engagement	
High demands on digitization and user experience	Need for change in methodology Service-based processes
Increased demands on accountability and transparency	Need for change in methodology
Encouraging innovation	Freedom to experiment
Promoting success	Sharing success
Attitude towards learning spirit	Freedom to experiment Improving mindset (process) Open communication Critical reflection on methods
Attitude towards collaborative exchange	Motivated people Collaborating people Willingness to help Stimulated safety and trust
Attitude toward empowered self-guidance	Critical reflection on methods Improving mindset (process)
Attitude towards customer co-creation	UX designers for user validation
Job satisfaction	
Alignment between IT and business objectives	POs from business Cross-Functional PO
Promoting champions	Sharing success

One driver that was not found in the literature is creating focus for team members. In the case of this research, some options are dedicated product owners or using the 80/20 rule (spending 80% of your time dedicated to one product per sprint). From a team perspective being able to work uninterrupted came forward more, especially considering teams in governments often are required to work on multiple projects. This turned out to be one of the most important drivers when considering teams working in local governments. The fact that it was not found in the literature points towards a lack in research combining a team perspective and a local government perspective. More research in this context should be done to confirm a lack of focus in other local governments.

There are also a few drivers from the literature that were mentioned by the teams in this research. General literature emphasises customer engagement as a driver for using Agile methods, however, from a team perspective this did not get reported. This is an interesting observation as customer engagement is one of the primary advantages of working Agile. One reason is that in the cases discussed in the local governments, there is not always a clear customer or end-user. Government officials can be responsible for projects, but are usually not involved and are not end-users. Interview participants did not mention incentives such as job satisfaction or career opportunities. Interviewees were approached to represent their team, which might influence their willingness to talk about individual drivers like these. When asked about promotions interviewees mostly mention that this is less of a factor since many team members are external employees. Finally, working software over comprehensive documentation might not have come forward because in many cases teams still have to comply with outdated management methods and end up working Water-Scrum-Fall (West et al., 2011), which can also be seen in the barriers subsection.

All teams report as drivers motivated individuals, willing to help and collaborate, and an improving mindset. The paper by Eilers et al (2022) describes the Agile mindset, made up of attitude towards

learning spirit, attitude towards collaborative exchange, attitude towards empowered self-guidance and attitude towards customer co-creation. The aforementioned drivers fall within the first 3 sub-categories leading to an Agile mindset. Additionally, the last category is focused on customer co-creation, some teams were found to work closely with the customer, while others reported a lack of commitment from the customer side which they are working on improving. To confirm these findings the questionnaire was used to verify these drivers based on the survey by Eilers et al. (2022). Questions 19 and 14 (questions below) indicate attitude towards learning spirit, with respondents on average agreeing with these factors. Questions 3, 4, and 12 confirm attitude towards collaborative exchange, with all but one answering strongly agree on these factors. Questions 8 and 13 confirm attitude towards empowered self-guidance, with respondents on average agreeing. It is interesting to note that respondents report slightly stronger Agile mindset indications for themselves than for teammates. This might point towards WYSIATI (What you see is all there is) bias where individuals believe they have all the relevant information and thus underestimate the amount of help team members give others (Daniel, 2017). This bias might also influence the perceived resistance by management towards Agile, as team members are not aware of all the considerations taken. It would be interesting to include and compare managerial perspectives in a future study.

- Q3: I enjoy helping others.
- Q4: I enjoy working collaboratively.
- Q8: I constantly think about improving my work methods.
- Q12: My teammates are always ready to help.
- Q13: My teammates often think about improving the work process.
- Q14: My teammates are very motivated.
- Q19: Critical thought has been given to our approach.

The research has shown that this Agile mindset has a positive effect on organisational performance mediated by strategic agility (Eilers et al., 2022). However, it does not say anything about increasing the use of Agile methods. The drivers found from each of the first 3 categories confirm the importance of the categories, while a common barrier with customer interaction indicates the importance of the 4th category. The factors indicating an Agile mindset, are reported by teams as drivers for the use of Agile methods. This is also supported by Morley (2022) who encourages factors for the Agile mindset as a basis for an Agile transition.

People are at the centre of Agile methods. As one interviewee summarised: ”The key success factors in a project are generally not if you use the right methodology but if you use the right people in the right place in the right way”. Yet this is recurring as a barrier in most teams. Teams call it having the right capacity in their team, many teams indicate issues with acquiring the right people for key roles. Mergel (2017) mentioned this as one of the primary issues with Agile governments. It is hard for governments to attract IT talent. A related barrier public organisations face is legislation (Nuottila et al., 2016), although this is not experienced at a team level it can also lead to issues with acquiring capacity. Some teams mention lacking vision in management to prepare for this, resulting in governments playing catch up. A more long term vision by governments in required to deal with this issue, possible solutions could include modernised personal plans and training programs for young professionals.

5.2.2. Comparing barriers

The barriers are presented and compared in Table 5.2 (Including references in Appendix E) in the same way as the drivers. While there were more barriers reported by interviewees than drivers, for the literature this was not the case. In the papers evaluated, there is more consensus on barriers than drivers as can be seen from the amount of articles per barrier. On an individual level barriers seem more impactful and easier to recall than drivers for interviewees.

Table 5.2: Combined Key Barriers to Agile Adoption

Barrier	**Context**
Overemphasis on processes and tools	No critical reflection on methods No sprint interjections
Documentation overload	Inadequate documentation
Lack of collaboration	No direct contact with user Lack of alignment between teams Ineffective management communication Bridge between business and IT
Outdated management styles	Hierarchical time management Overinvolved management Waterfall management
Resistance to change	Lack of Agile knowledge in organisation Resistance to change
Lack of management support	Absence of Agile guidelines Lack of commitment in management Lack of ownership in management Resistance to change Ineffective management communication Decisions by non-technical managers
Lack of knowledge in management	Hierarchical time management Overinvolved management Lack of Agile knowledge in organisation Ineffective management communication Decisions by non-technical managers
Inadequate training and education	Large tasks Absence of Agile guidelines Key roles experience deficiency Misunderstanding framework Team experience deficiency Lack of Agile knowledge in organisation Multiple backlogs Basic key role training
organisational culture misalignment	Lacking external commitment Competence-based teams Hierarchical time management No direct contact with user Lack of alignment between teams Top heavy complex hierarchy Different methodology tech and business Decisions by non-technical managers Slow layered processes
Insufficient customer involvement	Lacking external commitment No direct contact with user Lack of involvement from business teams
Lack of skilled practitioners	Key roles experience deficiency Lack of Agile knowledge in organisation Lacking capacity Business champions required No dedicated PO's
Difficulty scaling agile	Competence-based teams Overinvolved management Service based processes PO's requiring official decision-making power
Career risks	

Underestimating transformation impact	Slow layered processes
Fear of failure	Responsible and deliberate governments
Big Bang Deliveries	
Accountability paradox	Responsible and deliberate governments
Legislation	PO's requiring official decision-making power Slow layered processes
Focus on stability and accountability	Responsible and deliberate governments PO's requiring official decision-making power
Increased complexity of digital systems	
Insufficient funding (for IT infrastructure)	Lacking capacity
Lack of clear leadership and vision	Lack of ownership in management Lacking vision in management
Siloed organisational structures	Competence-based teams
Lack of agile mindset	No critical reflection on methods
Relying on external resources	
Lack of focus for teams (inexperienced POs)	Unclear PO roles Multiple backlogs Lack of focus

The barriers not covered by the literature are specific to the beginning teams and the traditional teams archetype. As a beginning team it can be hard to stay consistent without coaching or alignment from the organisation, a perspective that is overlooked when not considering a team's point of view. For the traditional teams clear direction, clear value, no prioritising required and predetermined scope are listed as barriers. These are barriers to using Agile methods as they eliminate a need for them, however, these barriers are not present in the literature as the literature focuses on negative situations and large Agile transitions. In this case, there is no need to implement a framework to deal with uncertainty and customer feedback. van Solingen (2020) explains Agile is not a solution to everything, as it is best suited for complex situations that cannot be planned in advance. Not needing an Agile framework in this case, does not negatively impact the team's performance. Within governments it is not rare to need to rebuild IT systems, one of the barriers is having to deal with complex IT systems maintained and developed by many different teams Nuottila et al. (2016), often involving technical debt. Although this barrier was not explicitly mentioned by the teams, the effects of having to deal with it are clear. Rebuilding is an investment to deal with this technical debt. Interviewees mention that trying to work Agile in this situation just makes work unnecessarily difficult ”If you have to build something big, then data warehousing is quite difficult to make Agile”. However one might argue that tasks could often be split up into smaller manageable tasks.

Similar to the drivers teams didn't mention career risks as a barrier. This might have to do with the interviewees having high job security, especially when comparing Dutch labour law to American labour law where some of the literature is based. Interestingly, relying on external resources is also not seen as an issue. When asked about the difference between internal and external employees many interviewees say they don't notice or even know who is external. Having to rely on external resources and the challenges that come with it have become normal. One last barrier from the literature that was not found from a team's perspective is big bang deliveries since all of the organisations in this research took a slow step-by-step approach. Within governments, it is typical to start Agile methods with a bottom-up approach while most of the organisation still works Waterfall (West et al., 2011).

While the research confirms that resistance to change is experienced from a management level, it should be noted that unlike in literature this resistance is not experienced at a team level. As shown before the team members all show an Agile mindset and are motivated to work more Agile (Eilers et al., 2022). Public organisations typically deal with a more bureaucratic structure (Ribeiro and Domingues, 2018). To get a better idea about how teams experience this resistance team members were asked to reflect on why there is resistance in management in the questionnaire. The most mentioned issue

is management not understanding what it takes to work Agile. This includes people not realizing how much commitment and time it takes to get involved in the Agile process. Besides team members feel managers are not willing to let go of standard traditional processes, besides agendas are so full with meetings that there is no time to adapt. Some colleagues have tried a suboptimal implementation in the past and are reluctant to try again. Finally, a lack of alignment and vision also contributes to the resistance. While these perspectives are all relevant to consider from a team perspective, it should be noted that participants where asked to freely share their opinions. Many answers point towards miscommunication of expectations between teams and management.

Specifically in public organisations, there is a major barrier that few teams mention but has an effect on some of the most experienced barriers. Government organisations have a need to be accountable and open in their decision-making, which can lead to risk averse behaviour and slow processes (Baxter et al., 2023). Governments typically focus on accountability and stability, which conflicts with adaptive governance(Janssen and Van Der Voort, 2016). For the interviewed teams this issue manifested in decisionmakers needing official decision-making power. These individuals are usually at a higher hierarchical level and have no time to involve themselves in the Agile processes. This makes the process of bringing decision-making power down to people who have technical expertise more difficult. This also relates to government organisations having difficulty defining PO roles and creating focus. Two interviewees mentioned: ”It is just not allowed to make decisions, that has to be done by official or in some cases democratically chosen members”. However, in practice, examples such as the bridging team have shown to effectively bring some of the decision-making down to technical experts. Being responsible or accountable for decisions doesn’t necessarily mean having to make a decision, the solution here lies again in building trust between teams and managers.

5.2.3. Archetypes

Some of the drivers are best utilised by certain archetypes. Similarly, some of the barriers affect certain archetypes more than others. The effect of archetypes’ specific context will be discussed in this subsection.

The LCKO archetype stands out because the teams involved had significantly more barriers to report than other archetypes. These teams were the most negative, talking about more barriers (and repeating them more often) than other teams. This can have to do with these teams typically having some experience working in the organisation, but usually also at a different place, which gives them a reference to compare to. Besides these teams all experience a need for change, that is not sufficiently being supported by the organisation. It stands out that by far most barriers point towards organisational support or blocking factors outside of the teams’ influence. Interviewees say ”we want to go! but the organisation is not ready” and similar phrases. Lack of dedication from external parties such as clients and end-users is also repeatedly mentioned as a barrier by these teams, this is a barrier, particularly for public organisations (Wisitpongphan and Khampachua, 2016). The customer is not always a clear (paying) entity, teams have experienced having to convince end-user to be involved in a product meant to improve their situation.

From a team’s perspective, the LKO archetype is the hardest to advance from as team members typically have limited influence or contact with management. The way to tackle this can be alignment and collaboration with teams and departments, to underline the importance and need within the organisation. POs and SMs can organise periodic meetings to address and start tackling barriers that ascend to single teams. An alternative that was found within the context of local governments is taking the bridging team approach. Bridging teams consists of both an IT and business side. The driving force behind this type of team is bringing these 2 sides together, which is done through a cross-functional PO. This is a great example of a digital champion, which is confirmed as a driver to spread Agile methods within governments (Vacari and Prikladnicki, 2015; Wilson and Mergel, 2022). These highly visible individuals don’t need to have technical knowledge, just support and coaching from the team or the organisation. The PO not having technical knowledge can even be an advantage, forcing him to rely on the team for decision-making. This can create trust after seeing success, an efficient way to accelerate the process

of creating autonomous teams (Stray et al., 2018).

Despite having a champion and bringing two disciplines closer, it is still a considerable challenge to combine IT and business. Business is mostly still working Waterfall which can create friction. This can be addressed by showing businesses the potential success of Agile, which was done in this case in the form of fast delivery and fast communication. This strategy potentially offers a way to spread the use of Agile methods in local governments while circumventing some typical issues this context brings.

Finally, management commitment teams in this research ran into the barriers of being competency-based and hierarchical time management. These are common barriers from literature (Rigby et al., 2016). The underlying reason is a lack of knowledge or experience in the management layer. The coaching and training should therefore not only be focused on lower management and teams, but also middle and upper management. Managers should aim to enable autonomous teams (Stray et al., 2018). The remaining barrier that could be addressed depending on context is to build trust with managers by taking responsibility and showing success. This means that management needs to be willing to let some authority go and play a supportive role, but it also means that teams must be willing to take responsibility.

5.2.4. Focus on team level

To conclude the discussion on drivers and barriers a focus is put on the team perspective this research has contributed to the general drivers and barriers in literature.

Overall in the barriers barriers there was a large focus on organisational barriers, while drivers were more focused on people and culture. This confirms findings by Ghobadi and Mathiassen (2016) who found that team-level individuals focus on project organisation barriers and project communication barriers. Here organisational barriers mentioned by team members fall mostly within the project organisation category. Communication barriers were mentioned to a lesser extent by the teams. Barriers that were not mentioned by interviews that were prevalent in literature (Jovanović et al., 2020) include budget, contract type and project time. These are all examples of barriers falling into the project setting category by Ghobadi and Mathiassen (2016). Which were according to them mostly mentioned by management-level individuals. Additionally, some barriers and drivers fall into the team capabilities category, which was mostly focused on by user representatives. It is logical to be found in this study as some cases involved users or people closely collaborating with end-users.

In addition, this research found that teams from local governments primarily struggle with creating focus. This can be seen in all archetypes with different effects. Within local governments, few developer teams are asked to do many projects. Less mature teams can face issues with commitment from team members. Team members don't always work for one team, creating overhead through many meetings. Slightly more mature teams struggle to collaborate and align focus within their department or organisation, making it harder to divide projects and create focused teams. Mature teams can struggle with overinvolvement from management, and being interrupted by ad hoc problem-solving and unnecessary meetings. One of the underlying reasons is a lack of dedicated roles and POs. The PO is a role that can assign priority and protect a team's focus. Within governments the role of PO is mostly not defined, making it harder to hire and assign the right people. Many of the recommendations in the Agile team advancement framework revolve around ways of creating more focus.

5.2.5. Performance

Measuring the performance of (Agile) methods is commonly done in literature by measuring perceived performance from several involved parties (Gemino et al., 2021; Serrador and Pinto, 2015). These approaches measure mostly the effect of a method on project outcome, however, an identified research gap is a lack of focus on the team's perspective. This gap is addressed in this research by measuring the perceived performance by the team members. The goal here was to measure how different archetypes perceive different performances.

The previous section has amongst others shown that people working in Agile teams and their mindset are important drivers for the use of Agile methods. To measure the perceived performance by teams inspiration was drawn from the TAM model (Overhage et al., 2011) as well as from previously mentioned approaches to measuring perceived performance (Gemino et al., 2021; Serrador and Pinto, 2015). This research allowed a team focus by measuring perceived usefulness, perceived ease of use and perceived project success by team members through a questionnaire.

There are limited differences detected between teams in terms of perceived performance. Notably on average teams are very satisfied with their methods. Respondents have as a frame of reference either previous workplaces or places in the organisation that still work with traditional methods. In the context of this research, organisations have recently undergone large scale changes to working methods, possibly influencing the perceived performance. The conclusion that there are no notable differences between archetypes in terms of perceived performance cannot be confidently drawn, because of a low sample size. Besides 2 of the archetypes, Kanban and Management commitment & expertise are not represented in this survey since their teams are all part of different organisations. Finally, of the 29 responses half represented the Lack of commitment and knowledge in organisation archetype (LCKO), while other archetypes have less than 5 responses. The questionnaire results are therefore more representative of LCKO teams. The results do indicate that teams from the same organisation might experience similar performance of their Agile methods, due to dealing with similar organisational drivers, barriers and conditions.

One notable exception is PZH1. PZH1 belongs to the lack of commitment and knowledge in the organisation archetype and is the only one of this archetype where some members have a different experience. A likely explanation for this difference can be found in the unique drivers and barriers (table 4.9). Here we can see that team PZH1 does not do development and has no shared user stories. The team is applying Scrum which is originally focused on software development and might therefore not properly align with the teams' work. Since the team has no shared user stories, this might also explain why some members of this team experience their method differently as they are working on very different tasks.

There is no indication that the team's satisfaction is impacted by the organisation's vision as suggested by (Serrador and Pinto, 2015). Despite lack of vision commonly being mentioned as a barrier in interviews and showing mixed results in questionnaires, teams are generally satisfied with their methods. A single exception is seen in the case of PZH1, a member not being satisfied with his working method also experiences a lack of vision. It might be that team satisfaction is less affected by the moderation effect of vision than other stakeholders(Serrador and Pinto, 2015). Interestingly one difference that can be seen between archetypes is that the beginning teams experience (strongly) agree with a clear vision. It could be that the inexperienced team have not yet encountered barriers experienced by other teams in their growth process.

The organisational mandate as a driver for acceptance and use of Agile methods turned out to be irrelevant (Riemenschneider et al., 2002). As discussed in the drivers and barriers section all team members have shown an Agile mindset indicating no resistance, unlike the context for Riemenschneider et al. (2002). Resistance on a managerial level is experienced, and as can be seen from drivers and barriers organisational commitment can make a large difference. From a team perspective, individuals report in the questionnaire the reason for this resistance might come from: not seeing value, inexperience, lack of vision, full agendas, and loss of control. Most of these are familiar from the drivers and barriers section, overfull agendas can lead to individuals not having enough space to experiment and relying on older known methods. However, this research does not include a management perspective, it would be worthwhile to investigate the different perspectives on this perceived resistance in future research.

5.3. Agile team advancement framework

Resulting archetypes and corresponding drivers and barriers were combined to create the Agile team advancement framework. The guiding principles in this framework were based on drivers, barriers from the corresponding archetype and possible solutions encountered in the literature and interviewed teams who overcame these barriers.

The Agile team advancement framework addresses several research gaps, most notably it shows a

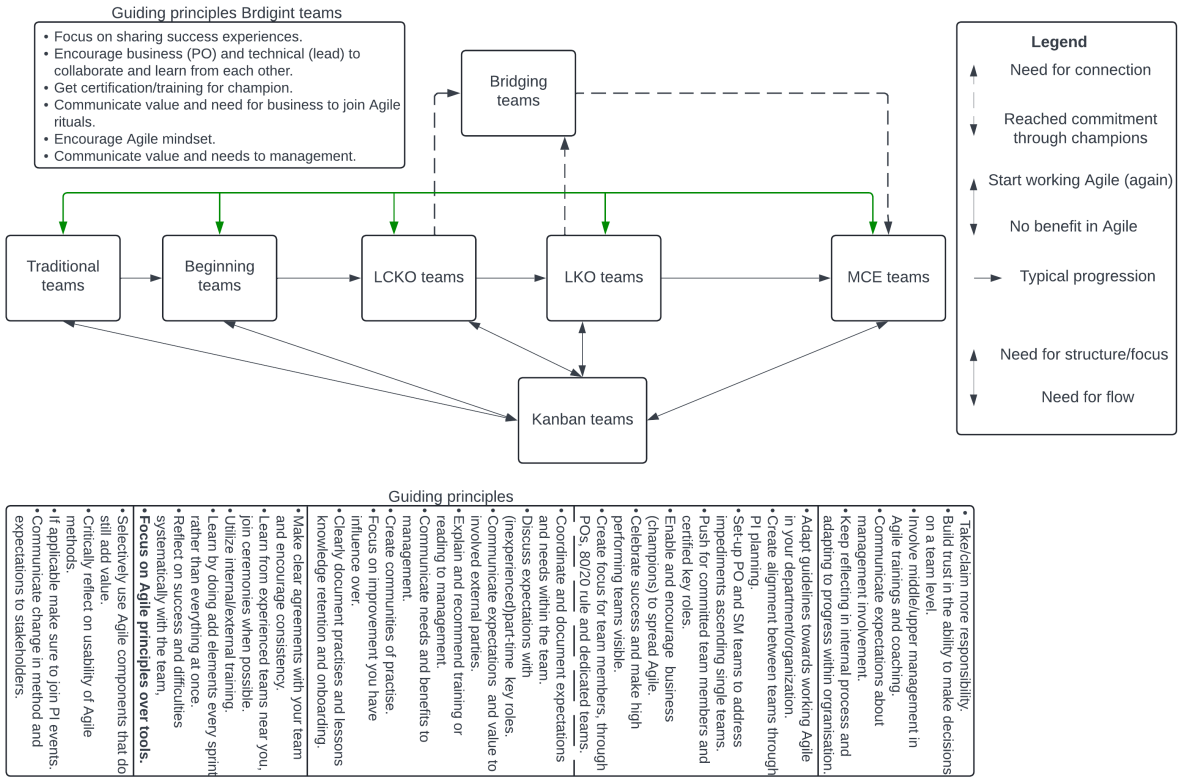

Figure 5.1: Agile team advancement framework

practical approach to stimulate the use of Agile methods in local governments from a team perspective. Teams can use the framework to identify their current situation and find ways to improve.

5.3.1. Guidance

Although general guiding principles are provided per archetype it is relevant to discuss some of them within their context (See also Table 5.3). Some guiding principles were not included in the model at a specific step, but are still important to consider. The Agile mindset came forward as a driver for all teams (Eilers et al., 2022). This is not included as a specific guiding principle for any team as all teams already seem to possess this Agile mindset.

Table 5.3: Guiding principles

Guiding Principles
Management commitment & expertise teams
Take/claim more responsibility.
Build trust in the ability to make decisions on a team level.
Involve middle/upper management in Agile trainings and coaching.
Communicate expectations about management involvement.
Keep reflecting on internal processes and adapting to progress within the organisation.
Lack of knowledge in organisation teams
Adapt guidelines towards working Agile in your department/organization.

Table 5.3: Guiding principles

Guiding Principles
Create alignment between teams through PI planning. Set-up PO and SM teams to address impediments ascending single teams. Push for committed team members and certified key roles. Enable and encourage business champions to spread Agile. Celebrate success and make high performing teams visible. Create focus for team members, through POs, 80/20 rule and dedicated teams.
Lack of commitment and knowledge in organisation teams
Coordinate and document expectations and needs within the team. Discuss expectations with (inexperienced) part-time key roles. Communicate expectations and value to involved external parties. Explain and recommend training or reading to management. Communicate needs and benefits to management. Create communities of practice. Focus on improvement you have influence over. Clearly document practices and lessons for knowledge retention and onboarding.
Beginning teams
Make clear agreements with your team and encourage consistency. Learn from experienced teams near you, and join ceremonies when possible. Utilise internal/external training. Learn by doing, add elements every sprint rather than everything at once. Reflect on success and difficulties systematically with the team. Focus on Agile principles over tools.
Traditional teams
Selectively use Agile components that still add value. Critically reflect on the usability of Agile methods. If applicable, make sure to join PI events. Communicate change in method and expectations to stakeholders.
Bridging teams
Focus on sharing success experiences. Encourage business (PO) and technical (lead) to collaborate and learn from each other. Get certification/training for champions. Communicate value and need for business to join Agile rituals. Encourage Agile mindset. Communicate value and needs to management.

For traditional teams, a typical reason to stop working Agile for a while is to rebuild a system. Since in governments teams are usually dealing with complex IT systems being developed by several teams, of which some external there might be a lot of technical debt that needs to be addressed by redesigning or rebuilding a system (Nuottila et al., 2016). This is typically a long process in which the direction is clear and there is no need for customer interaction. In situations like these, the benefits of working Agile cannot be exploited. While not represented in this sample, traditional teams also represent teams that have never worked Agile. The first step towards working Agile (and entering the beginning team archetype) is also critically reflecting on a team's working method and considering if Agile would improve the current situation. While working Agile offers many benefits it is not applicable in every situation.

Beginning teams mostly struggle with experience and coaching. The best way to deal with this issue depends on what is available. It would be ideal to have coaching, guidelines or training internally, this way the specific context of the organisation can be directly addressed. When this is not available teams should look for external opportunities to train, one of the interviewees mentioned following external training is especially useful when done with the entire team as a group. Besides learning Agile this allows for team building. Within their training, it is important to start with the importance and value of the underlying Agile principles. This could prevent blindly following and misunderstanding frameworks. This way some issues with misalignment of work with working method can be circumvented.

Teams starting to work Agile (traditional and beginning teams) can also start by implementing Kanban, which might be an accessible way to start experimenting if there is no Agile experience or coaching available. Starting to work Kanban can start from the small step of having a physical Plan Do Check board. This can be an accessible way to start experimenting with Agile. Typically, teams would switch from Kanban to Scrum when there is a need for more structure and focus, or customer engagement. Especially when working as a development team in a government it is quite likely that Kanban might be hard to manage at some point due to having to focus on multiple projects. Although switching to Scrum doesn't solve this problem, it gives more tools to help create focus and consistency for the team, especially if a PO gets assigned.

From interviews, it was clear that LCKO teams feel like they face many barriers, which they cannot directly control. Here they run the risk of giving up or getting increasingly frustrated instead of focusing on factors they can control. It is unclear for these teams how to improve, the framework can not only help these teams focus on what they can do. It can also bring peace of mind within the team to clearly show they did what could be done and communicate this with each other.

LKO teams differ from the LCKO teams mainly on some sort of commitment within the organisation, typically in the form of a department having decided to work Agile. This is the hardest archetype to advance from as it takes a long time to reach full commitment towards an Agile adoption in an organisation and individual teams typically have limited influence. This makes it important to focus on the alignment between teams and departments and slowly include people and show the possibilities of working Agile in the organisation. Teams in this archetype should be relatively experienced with working Agile, however, one improvement that can often be done here is to create more focus as discussed in the results.

Bridging teams are a bit of a special case. Within governments and a rising need for digitization, it is not uncommon to find a need for teams from IT and teams from business to connect, work together or even team up. This challenge enables a unique opportunity within local governments to create bridging teams. Since business teams in situations like these are usually more visible and have closer contact with management this allows spreading the use of Agile methods in the organisation more effectively. The success of stimulating Agile use through this approach depends on the champion. It is therefore essential that this champion is supported by the organisation or the team and gets appropriate training and support.

Reaching the final archetype MCE does not mean progression is over. This block represents a situation in which teams and the organisation are prepared to undergo the Agile transition however, this will take years of continuous learning to reach the full potential of an Adaptive government and Agile organisation. After all, one of the underlying values of working Agile is continuous improvement. In this research teams and organisations were all far from being completely Agile. In future research with a larger sample size another stage in the progression might be added, based on drivers and barriers not yet encountered by the teams from this research.

Finally, just as this research has drawn inspiration and experiences from other organisations so should organisations themselves. As van Solingen (2020) mentions not every impact of the Agile transformation can be foreseen, regardless of whether you have a transformation team or not. organisations can learn from each other through company visits or other ways of exchanging knowledge and experience.

6

Conclusion

This research aimed to explore the use of Agile methods within project teams in local government organisations in the Netherlands and to develop an Agile team advancement framework to stimulate Agile practices. Through the analysis of various Agile methods and team archetypes, the study highlighted significant barriers and drivers that impact the use of Agile methods from a team perspective. In the sub-questions the study addressed the formation of team archetypes, their corresponding barriers and drivers and the perceived performance.

6.1. Theoretical contribution

This research addresses several gaps identified in the literature review as shown in Table 6.1. Most importantly it extends the understanding of Agile methods within the context of local government organisations, an area relatively underexplored compared to the private sector. A basis for future research to address the need for context-specific tools and frameworks to better fit the unique requirements of local government teams is provided.

Nr	Research gap	Related to question
1	There is a lack of practical frameworks to stimulate the use of Agile methods from a team perspective in local governments.	RQ
2	Further research is needed to understand how Agile methods can be effectively scaled within governmental structures and what specific adaptations are required to overcome the unique challenges in this context.	RQ
3	There is a lack of empirical studies on the implementation and impact of Agile frameworks in the public sector, specifically within local governments.	RQ, 1, 2, 3
4	There is limited research on the specific archetypes of Agile teams within local governments, a more nuanced categorization beyond simple framework-based distinctions is required.	1
5	There is a need to explore the specific motivations and modification objectives of Agile teams in local governments.	1
6	Further research is needed to understand how team characteristics, including management support and experience levels, influence the performance and use of Agile methods in local government teams	1, 3
7	There is a need for qualitative research to understand the underlying drivers and barriers to choosing a hybrid approach over a pure Agile approach.	1, 2
8	There is a need for research that examines how drivers and barriers from private sector contexts affect the specific socio-technical environments of local government organisations.	2
9	There is a need for empirical studies examining how specific Agile practices influence satisfaction and performance in local government teams.	3

10	Further research is needed to develop robust, context-specific tools for measuring satisfaction and performance in local government Agile teams.	3

Table 6.1: Summary of research gaps

To address the main research question: **"How can project teams in local governments stimulate the use of Agile methods?"** This study explored the following sub-questions:

What team archetypes represent the typical use of Agile methods in local governments?

Answer: Archetypes were developed based on the 4 dimensions Agile framework, reason to change, experience, and management support maturity. The resulting archetypes offer a structured way to understand the progression of Agile teams in local government contexts. This categorization not only aids in recognizing typical team structures and challenges but also provides a basis for comparing and contrasting different Agile implementations.

What barriers and drivers towards the use of Agile methods are experienced by the teams?

Answer: By comparing drivers and barriers experienced by teams with literature this study examines the use of Agile methods in local governments. Key barriers include lack of management support, lack of focus, lack of knowledge, unclear roles, lack of alignment and organisational resistance to change. Important drivers for the use of Agile methods include Agile mindset, Agile coaching, dedicated key roles, dedicated management and freedom to experiment and structure. The research shows the Agile mindset contributes to stimulating the use of Agile methods (Eilers et al., 2022). A difference in perspectives between teams and managers was confirmed (Ghobadi and Mathiassen, 2016). Additionally, from a team perspective focus was found to be the greatest obstacle. Each archetype faced unique barriers and drivers, which were crucial in tailoring specific strategies for increasing the use of Agile methods.

How do different types of (Agile) team management impact the perceived performance by team members?

Answer: No significant difference in perceived performance was observed between team archetypes, indicating that perceived performance may be influenced by a broader range of factors beyond the scope of this study. Overall perceived performance was consistent and might indicate that teams from the same organisation experience similar levels of perceived performance. Although the results were inconclusive, the approach provides a basis to evaluate perceived performance from a team perspective.

Answering the sub-questions enabled answering the main research questions through the development of a practical framework that teams can use to increase the use of Agile methods in their organisation. **How can project teams in local governments stimulate the use of Agile methods?**

Answer: Project teams in local governments can stimulate the use of Agile methods by following the Agile team advancement framework brought forward in this research (see figure 6.1). This framework provides guiding principles for every type of (Agile) team within local governments. Guiding principles were developed by addressing specific barriers and leveraging key drivers identified in the study. The practical framework includes incremental steps for Agile maturity, teams can navigate organisational challenges, enhance team collaboration, and align with best practices for Agile transformation. A prominent feature of the framework is the emphasis on bridging teams between IT and business functions. This approach addresses the siloed nature of local government organisations and promotes better alignment, communication, and collaboration through the use of champions. Bridging teams provide a unique opportunity for local governments to accelerate towards Agile maturity.

The Agile team advancement framework shows 7 blocks containing the 7 team archetypes resulting from sub-question 1. Here LCKO, LKO and MCE stand for Lack of commitment and knowledge organisation, Lack of knowledge organisation and Management commitment & knowledge respectively. Arrows indicate possible moves from one archetype to another. The middle row shows a typical progression towards increasing the use of Agile methods. On the right side, the typical reason to move in the direction of the arrow is denoted. The striped arrows indicate there are certain conditions for

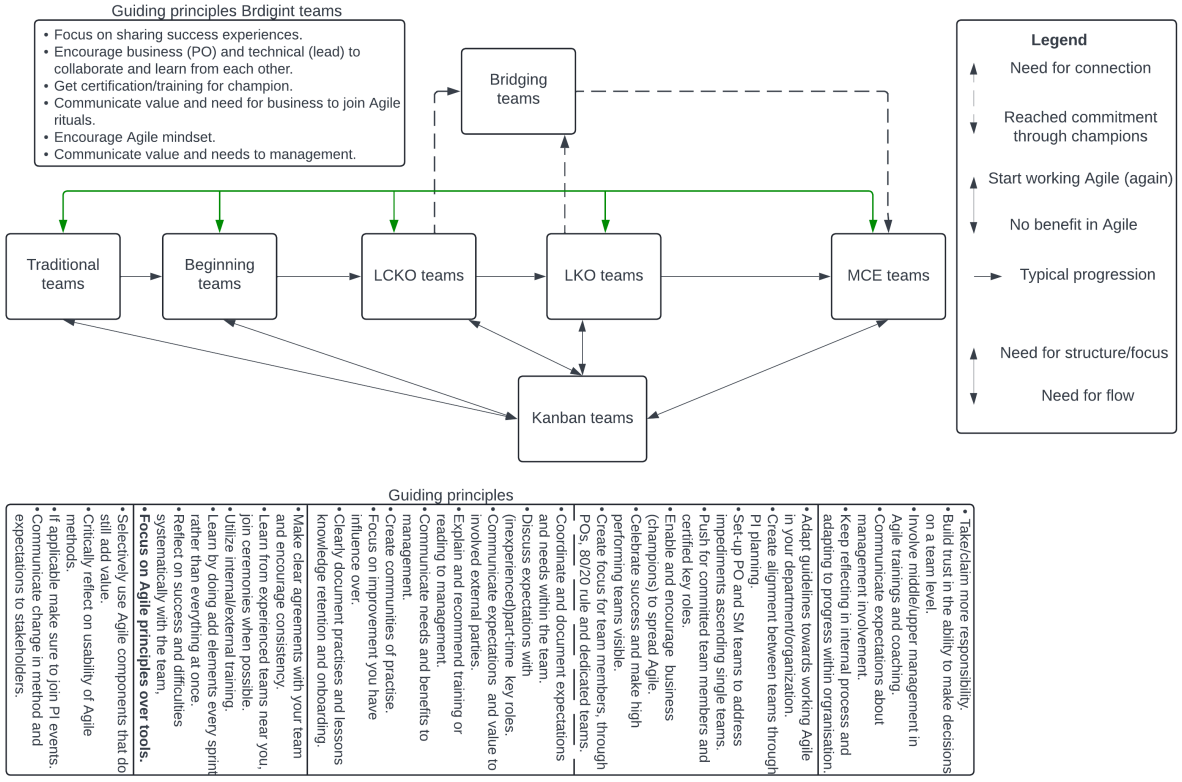

Figure 6.1: Agile team advancement framework

bridging teams; These teams require a champion and a possibility for business and technical teams to collaborate. The green arrows indicate a path that can only be taken backwards or forwards to the same block you came from. Finally, the blocks on the top and bottom hold guiding principles to progress per archetype. The Guiding principle blocks for LCKO and LKO teams have a striped border as there is an overlap between their guiding principles.

6.2. Limitations

Despite valuable insights, several limitations exist in the study that must be acknowledged. Firstly, the study is highly contextual. The sample size is relatively low and focuses exclusively on 3 local governments in a single province of the Netherlands. While the study identified management support and team experience as significant factors, it did not extensively explore other organisational aspects that can influence use of Agile methods. While making the study highly relevant for the involved parties at this time, it does mean the generalisability of the study is low. Besides a qualitative explorative approach means none of the results have been qualitatively validated.

Several biases exist in the study. The data from interviews and surveys is all self-reported. Besides a difference in perception and reality, respondents might be giving socially desirable answers. Additionally, participants were asked to participate in an interview about Agile, creating a bias for people who are interested in and motivated to work Agile. The bias was attempted to be reduced by critical reflection and observation by the researcher. This also introduces the researcher's own bias, the interpretation and coding of qualitative date from interviews and surveys is highly subjective.

The study relied on perceived performance as reported by team members, without incorporating objective performance metrics such as project completion times, quality of deliverables, or customer satisfaction ratings. Besides the sample to evaluate this sub-question did not involve 2 of the archetypes and could therefore not accurately represent the difference between teams with high or low manage-

ment support. Besides the resulting archetypes in the research are highly dependent on the available teams. The researcher attempted to find diverse teams in terms of methodology and context, however, a different sample of teams might produce different archetypes and results.

6.3. Future research

Future research should address these limitations by expanding the scope of this study to include a broader range of local government organisations and contexts. A larger sample size would enhance the generalisability of the findings. Additionally, quantitative studies should be carried out to verify the resulting Agile team advancement framework and conclusions.

The gaps shown in Table 6.1 clearly outline future directions of research. Based on the provided frameworks and approaches in this study more in-depth research with varying datasets can be carried out to validate the usability of these approaches. While this research shows an approach to spread Agile use within an organisation it is limited by the maturity of organisations in the sample. A next step to expanding the proposed framework would be to investigate what further steps can be taken after having reached the full management support & expertise archetype.

As discussed in the discussion the archetypes and definitions used for perceived performance can influence the outcome of the study greatly. The dimensions used to categorise teams should be further investigated especially motivations to change in line with the research by Hron and Obwegeser (2022). The resulting archetypes could be more representative in a wider context. Current archetypes are assumed to linearly follow each other and teams generally follow predictable growth patterns (Ito and Brotheridge, 2008). However, the research was not extensively compared to team growth literature and could be enhanced by insights from this field.

Further research into the definition of performance is also required; In this research, perceived performance was defined as perceived usefulness, perceived ease of use and perceived project success. More factors should be considered which could be relevant to perceived performance by teams. Taking this approach and setting up a larger-scale survey the differences in performance between archetypes could be clearly outlined.

Based on research by Serrador and Pinto (2015) it would be interesting to explore the finding that vision has less impact on team's satisfaction than other stakeholders. Further research could also explore the longterm effects of Agile practices and the application of the Agile team advancement framework in a government, providing valuable data to inform ongoing Agile transformations in government settings. Additionally, the following questions came up during research that could be further explored in future research:

- Is there an inverted U-shaped relationship between experience/management commitment and experienced barriers?
- What is the tradeoff between freedom to experiment and strict guidelines for Agile teams? And how does this impact the diversity and fit of methodologies?
- What are the effects of bridging teams and how can they be most effectively created?

6.4. Application in practice

From a practical perspective, the research offers an Agile team advancement framework that local government project teams can use to stimulate the use of Agile methods. This framework provides actionable steps and principles for teams at various stages of Agile maturity, helping them navigate common barriers and leverage key drivers effectively. The emphasis on small, incremental changes rather than a big bang approach aligns with best practices in Agile transformation, ensuring a smoother transition and higher chances of success. Moreover, the insights gained from expert reviews and validation of the framework with literature provide a solid foundation for its practical applicability.

The effectiveness of the results and framework was tested within one of the participating local government organisations. While the long-term effectiveness remains to be seen, several short-term effects have been observed. Following the research's recommendations, a community was established within Provincie Zuid-Holland to align teams and discuss shared issues among key Agile roles across the organisation. Initially comprising members from development teams, this community lays the foundation for expanding to non-IT teams. The first session focuses on sharing experiences, introductions, and identifying needs for future sessions, including training on PO roles.

Interviewees expressed great interest in sharing their barriers and learning how others handle similar challenges. Having a platform to see differences in experience levels and to ask for help has already proven beneficial for teams to learn from each other within their organisational context. Over time, this should foster greater awareness about common practises and solutions and increase collaboration between and management.

Presenting results from development teams provides an opportunity to define a problem statement that resonates with both teams and management. In the current state, the research has mostly sparked conversations. The importance of starting conversations that lead to shared understanding and potential improvements cannot be underestimated at a time when the organisation is planning their digital strategies.

Initial feedback indicated that while the framework is comprehensive, it might be too complex, especially when communicating needs to less technical managerial roles. Simplifying the framework and ensuring that key concepts are easily understandable for all stakeholders is crucial for broader acceptance and effective implementation. To implement the framework outside of the IT domain it might be good to revisit the academic approach and simplify the model.

In the final weeks of the internship, more practical applications of the methods will be experimented with. For instance, Agile communities and presentations to a broader audience including management will give more diverse feedback which can be used to further refine Agile processes within the teams. Additionally, there are plans to incorporate training sessions tailored to the specific organisational context to ensure a broader understanding and implementation of Agile principles across different departments.

The first implementation highlighted the importance of creating a structured yet flexible framework that accommodates the unique requirements of local government settings. By focusing on incremental progress and continuous improvement, the framework can adapt to evolving needs and challenges. For those interested in the results and further developments, it is recommended to contact the researcher directly.

6.5. Reflection

The process of researching and writing this thesis has been both challenging and enlightening, offering numerous learning opportunities and insights into Agile methods in practice as well as effective research and time management. It would be hypocritical to be spreading the word of Agile without reflecting and taking lessons from the process.

Managing time with a fulltime internship

Balancing a fulltime internship with the demands of thesis work proved to be a considerable challenge. Effective time management and prioritisation became crucial. Working in sprints with smaller goals helped with this process. There were moments of fatigue and stress, emphasising the need for realistic goal setting and the importance of self-care. Eventually, I had to prioritise thesis work over my internship tasks, resulting in multiple sprints with unfinished tasks at my internship. My supervisors were very supportive of my thesis goals. However, I would have liked to be able to spend a bit more time focusing on the practical application. Finishing a thesis within 5 months doesn't really allow this, for the next time I would prefer to start my internship before my thesis to already get familiar and be able to better

define possible research directions.

Time estimations and iterative working

One of the hardest aspects of time management was estimating how long tasks would take. A common pitfall for individuals starting to work Agile as well. Unfortunately, I did not have the experience to foresee how long for example transcribing and planning interviews was going to take me. This eventually resulted in surveys having to be rushed, in hindsight, it might have been better to only do interviews and perhaps involve some more teams. The surveys did give some useful results and validation next to the stress though.

Low survey response rate

The low response rate to the surveys was a notable obstacle. Initial attempts to gather data yielded fewer responses than anticipated. This had everything to do with unfortunate timing (during vacation periods) and underestimating average response rates to interviews. To address this, multiple followup requests were sent. It would have been good to have multiple ways to reach the targeted audience for the surveys, especially at external organisations, which in the end was not possible to include anymore.

Difficulties in understanding and seeing the relevance of literature

At the start, understanding and discerning the relevance of existing literature was a significant challenge. The research had common grounds with many research areas including Agile, governance, adoption, acceptance, collaboration, project management, and government literature. None of these fields I am an expert in, and I also wasn't sure which direction the research was taking me. The abundance of information available made it difficult to identify which sources were most relevant to research. After interviews insights were gained from data collection, and the relevance of various theoretical perspectives became clearer. Eventually, I spent a lot of time in the beginning on trying to understand literature, while it would have been useful to just start exploring some data first. Some amount of uncertainty cannot be avoided, but it would have been good to iterate more between literature and data collection, instead of trying to finish one before the other.

Delivering iteratively

For being continually involved with drivers, barriers and pitfalls of working Agile, it surprised me how blind I was to my own process. I tried to collect all the data in 2 iterations and develop the results at once. Here I missed many opportunities of working and delivering iteratively. I've had meetings with supervisors where I had nothing to show because I wanted to show something finished. Completely robbing myself of feedback cycles which would make my work a lot easier. The same applies to the interviews I did, I spent a long time trying to figure out beforehand what the perfect interview was, admittedly it turned into a decent protocol, but it took almost 2 weeks. While after the first interview, I already gained a lot of new insights that I could incorporate in the next interviews. I should have started working out the data iteratively between interviews and planned them with a bit more space in between. This way I could have gained a lot more direction and wouldn't have to spend much time on data that I didn't know was going to be less relevant. This is advice my professors could and have given me 10 times, but I will only realise after doing it wrong once.

Connecting and networking

One of the most valuable experiences has been connecting with people working internally as well as externally. Especially Agile experts I have talked to have given me tremendous amounts of information and direction. This doesn't only apply to my thesis, but also to my future and career path. I spent a lot of time meeting and talking to people in the first 2 months, and this has been the best decision of the process.

Takeways

Overall, it seems ironic to me that most of the difficulties I faced could be addressed by taking a more Agile approach to my research. The challenges and mistakes I made offer valuable lessons. I look back on a rewarding and valuable process, with the exception of a few weeks of overwhelming stress and time pressure. Besides learning about the process of doing research, I have gained a much deeper knowledge of Agile methods, and a clear idea of where I want to continue my path after my master thesis. The opportunity to easily approach and learn from experienced members of the field are most valuable for me.

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A

Interview Protocol

Context questions

1. In which team/project are you working?
2. What is your role within the team and within the organization?
3. What is your team working on?
4. In which domain does your team operate?
5. How much experience does your team have with Agile working methods? And yourself.
   Agile methodology
6. How is Agile working practiced in your team?
7. Do you use a specific framework?
8. What tools does your team use to support this process?
9. Why do you work in this way?
   How did this way of working come about?
10. What were the difficulties and obstacles during this process?
11. What helped in adopting this way of working?
12. What difficulties are you currently facing with the current way of working?
13. Which parts of the methodology bring value to you?
14. Are there parts where you see little added value?
15. In your estimation, what is needed to work more Agile? Do you want this?
    Collaboration
16. Does your team socialize outside of work, for example, through activities or drinks?
17. How do team members interact with each other, and what is the atmosphere like?
18. How are conflicts dealt with when they arise?
19. How does this compare to how the rest of the organization deals with conflicts?
20. Can you describe the level of competition within your team or organization?
21. How do you experience hierarchy within the organization, and does it affect your work?
22. Do you notice a difference in social interaction between internal and external colleagues?

23. Is there anything you would like to add that we didn't discuss yet?

B

Drivers and Barriers coding with quotes (in Dutch)

Team	Code	Quote
PZH1	Current barrier	“omdat we ook niet volledig development team zijn”
	Current barrier	“niet dingen als echt user acceptance test of acceptence criteria”
	Current barrier	“niet zeg maar één product waar we met zijn allen aan werken”
	Driver	“omdat het dus niet mogelijk eigenlijk is om op de lange termijn echt strak te gaan plannen”
	Driver	“We merkten dat daar de behoefte aan kwam en dat het toch wel iets duidelijker werd”
	Current barrier	“gebrek aan de juiste capaciteit.”
	Current barrier	“onvolwassenheid of onprofessionaliteit van de organisatie.”
	Current barrier	“dan horen ze allemaal termen en denken ze, oh jee, hier willen allemaal mensen weer moeilijke dingen enzo gaan doen”
	Current barrier	“Maar beleid komt nog niet goed genoeg, vaak richting ons.”
	Drivers	“Dus de intentie is er demotivatie is er denk ik ook”
	Drivers	“In principe de competentie ook”
	Current barriers	“moeten iemand erbij hebben die de rol van product owner tijdelijk gaat oppakken.”
	Current barriers	“processen zijn echt ontzettend traag en niet bevorderlijk voor Agile teams”
	Current barriers	“de organisatie kent het niet”
	Current barriers	“iemand moet gewoon die keuze maken. En dan ook gewoon geld aan toekennen”
	Current barriers	“Maar niet soms even stilstaan reflecteren en kijken naar morgen en nog veel verder daar voorbij”
	Drivers	“op een gegeven moment die keuze maken”
	Drivers	“een open proces maken waarin je waarin je focus houdt”
	Drivers	“We hebben de vrijheid om zo te werken binnen onze eigen. Kader.”
	Current barrier	“wij willen wat sneller gaan, maar beleid kan het niet.”
	Current barrier	“die hiërarchie is nodeloos complex. Is ook vrij top heavy.”
	Current barrier	“slecht gedocumenteerd, waardoor je ook niet goed weet waar je naartoe moet”
	Current barrier	“niemand kiest voor een overheid, dus dat moet wel overwogen”
PZH2	Current barrier	“De SM en PO zijn beginnend in hun rol.”
	Drivers	“We hebben een SM en PO, beide zijn hiernaast ook deel van het team.”

Team	Code	Quote
	Drivers	“Eigenlijk werkte ik al op een vergelijkbare manier, ik wist alleen niet dat er een naam en gestructureerd framework bij hoorde.”
	Current barriers	“Omdat de deadline al vast staat en het goed kan zijn”
	Current barriers	“Het was voor ons af en toe lastig om consistent de onderdelen te blijven doen.”
	Current barriers	“dat de teamleden niet allemaal dedicated aan het project waren, de meesten moeten hun aandacht delen over meerdere projecten.”
	Current barriers	“meer senior begeleiding zal het proces kunnen versoepelen.”
	Current barriers	“Dit zelfde geld voor externe partijen waarmee samen gewerkt moet worden.” (commitment bij externen)
	Drivers	“Een gemotiveerd team.”
	Drivers	“Vrijheid voor het team om te experimenteren en beslissingen te nemen.”
	Drivers	“De training die houvast geeft voor het team om de aanpak op te baseren.”
	Drivers	“het team is open in communicatie”
PZH3	Current barriers	“Wat ik merk is dat wij niet echt dedicated product owners hebben binnen de provincie.”
	Drivers	“maar belangrijker nog is dat we zelf meer grip willen krijgen op onze eigen data”
	Current barriers	“Vooral het inschatten van sprints en de capaciteit voldoende hebben is een probleem.”
	Current barriers	“De enigen die gecertificeerdis dat ben ik denk ik.”
	Current barriers	“verandering dat wekt weerstand op”
	Drivers	“de vrijheid om te experimenteren en uit te zoeken hoe je wil werken.”
	Drivers	“Dat is vooral de sponsoring van manager posities.”
	Drivers	“die daar ook wel gewend mee waren om mee te werken.”
	Current barriers	“zijn aan het kijken ook naar de communicatievorm, omdat een afstemming is een belangrijke”
	Current barriers	“Als je wat minder ervaring hebt, dan vraag je nog wat regie.”
	Current barriers	“maar dan moeten er wel afspraken zijn dat je minimaal 20 uur 16 tot 20 uur op een traject zit om het een klein beetje te kunnen handelen.”
	Drivers	“Dat we met ux Designers werken die ervoor zorgen dat de stories uit beeldend worden uitgebeeld.”
	Drivers	“voor teams is veiligheid en vertrouwen natuurlijk erg belangrijk en dat dat kan je op die manier veel eerder realiseren.”
	Drivers	“Dat is wel een belangrijke dat je mensen binnenhaalt in je team die ook passen in dat team.”
	Current barriers	“We hebben wel met procedures te maken en processen en die kunnen wel heel, heel taai zijn en traag zijn dat sowieso”
PZH4	Current barriers	“soms heb ik wel product owner taken. Ik probeer dat zoveel mogelijk af te houden”
	Current barriers	“We hebben twee product owners. Maar zij zijn eigenlijk best wel druk en niet heel erg beschikbaar voor ons team.”
	Current barriers	“geen dedicated product owners”
	Drivers	“Een collega binnen het team is ook een soort product owner”
	Drivers	“ik denk dat een van de grootste aspecten is dat wij dus flexibel zijn en heel erg klantgericht.”
	Drivers	“wij hebben de gebruikers echt zo hard nodig voor de applicatie”
	Past barriers	“we hadden niet dedicated team leden”
	Drivers	“nu hebben we meerdere fulltimers”
	Barriers	“Het was heel erg duidelijk wat we moesten doen”

Team	Code	Quote
	Current barriers	“dat er vanuit hoger af wordt besloten dat we bepaalde dingen moeten doen en dat daar dan een bepaalde deadline aan hangt”
	Current barriers	“behoefte aan mensen die beslissingen kunnen nemen”
	Drivers	“welwillendheid van het team”
	Drivers	“dat het team heel erg. motiveert om te denken in oplossingen en dus de developers die denken ook heel vaak mee over het proces.”
	Drivers	“onze projectmanager, die is echt super. Die steunt ons heel erg juist om dit proces helemaal te omarmen”
	Past barriers	“weerstand van de vergunningverleners om de manier waarop ze al jarenlang werken”
	Drivers	“de klant is heel erg betrokken”
	Drivers	“bonding voor het team om elkaar gewoon wel regelmatig te blijven zien” “als team soort van een band met elkaar hebt, dat je dan ook beter werkt”
	Current barriers	“mensen zijn binnen management die. Ja, die waarde van Agile niet echt in zien”
	Drivers	“de volwassenheid van het team maakt dat iedereen heel erg meedenkt en welwillend is om toch een beetje die extra loodjes te dragen.”
	Current barriers	“Dat was dus heel normaal om van mijn collega’s daar feedback te krijgen” (nu niet)
	Current barriers	“dat iemand dan uiteindelijk een beetje onzeker is over zijn of haar positie binnen in dit team”
	Current barriers	“Alleen wordt het niet goed gecommuniceerd naar of de gebruiker of naar ons.” (vanuit management)
	Current barriers	“beslissingen worden genomen zonder eigenlijk met de techniek te praten”
PZH5	Drivers	“we zijn redelijk multidisciplinair”
	Drivers	“ieder behoorlijk wat ervaring zou moeten hebben met Agile development”
	Current barriers	“Zoveel geld heb ik en dit is wat ik er voor wil hebben”
	Drivers	“het proces Laten groeien, bespreekbaar”
	Drivers	“Mensen die zijn er wel mee bekend dat wij een sprint lopen en dat je daar niet zomaar ander werk injecteert”
	Current barriers	“we zijn niet gefocust op hetzelfde.”
	Current barriers	“je context verandert de hele tijd”
	Current barriers	“Binnen de organisatie is niet 100% duidelijk wat een product owner nou bijvoorbeeld is”
	Current barriers	“die definitie wordt herbruikt in een andere context waardoor de verwarring ontstaat.”
	Current barriers	“wij schakelen met iemand die knopen kan doorhakken en zodat wij het product kunnen maken”
	Current barriers	“Mensen niet durven te gaan staan of ownership durven te nemen.”
	Current barriers	“dus niet elke keer een sprint open te breken op het moment dat er dat er ergens iets langskomt of omdat puntjes c toch belangrijker blijkt te zijn dan punt A”
	Current barriers	“proces terecht waar dat gewoon maanden duurt.”
	Current barriers	“wel goed goed met elkaar kunnen communiceren”
	Current barriers	“online werken wel moeilijkheden kan meebrengen”
PZH6	Current barriers	“het IT team werkt Agile, maar de beleids teams niet.”
	Drivers	“het team zelf ook een product owner”
	Current barriers	“mijn opdrachtgever die wil graag een bepaalde planning hebben en een idee van wanneer wat klaar is.”

Team	Code	Quote
	Past barriers	“ik wist ook niks van scrummen”
	Drivers	“Ik heb een cursus Agile essentials gedaan”
	Current barriers	“die cursus was eigenlijk te algemeen.”
	Drivers	“dan word ik geholpen door een collega die weet er veel vanaf dus diecoacht mij daar eigenlijk bijna een beetje in”
	Current barriers	“het moeilijkste hierin vind. Is echt mijn rol als zeg maar spil tussen de de IT en het beleid.”
	Current barriers	“Vrijblijvend, dit is nuttig. Maar als ze het dan ook echt moeten gebruiken, wordt het ineens een ander zaak”
	Current barriers	“er is ook niet zeg maar top down, een soort van idee van hoe wij digitaal moeten gaan werken.”
	Drivers	“mijn prioritering totaal anders was dan de prioritering van het team.”
	Drivers	“het ervaren van zo’n werkwijze heel erg positief is, waardoor je het meer wilt doen”
	Current barriers	“aan de kant van de beleidsmensen. Heb je een aantal pioniers nodig”
	Drivers	“dat je veel sneller met elkaarschakelt.”
	Drivers	“Ik laat me prima leiden door als het team zegt”
	Drivers	“doordat jij zo open bent, geef ik heel veel ruimte”
	Drivers	“Maar ik ben wel gewoon met vertrouwen de samenwerking aangegaan met het team.”
PZH7	Drivers	“die wel al gewend zijn om in Agile teams te werken.”
	Drivers	“Ik spreek aan Agile coach scrummaster”
	Current barriers	“wat we ook erg misten was een echte product owner.”
	Current barriers	“De organisatie management lijkt geen idee te hebben wat het inhoudt.”
	Current barriers	“Van management moeten we gewoon 5 verschillende dingen doen In de sprint.”
	Current barriers	“Het is vooral opboksen tegen de tegen de organisatie”
	Drivers	“je krijgt wel als hoog groen licht voor”
	Drivers	“Het is wel zo dat ik de laatste tijd wel redelijk fulltime scrummaster ben”
	Drivers	“het team is over het algemeen wilde wel graag ermee”
	Current barriers	“Reviews worden eigenlijk alleen bezocht door internen, daarmee slaan we de validatie stap eigenlijk over”
	Drivers	“Mensen die dan opspringen van ik help je wel, dus dat die spirit is er zeker.”
	Current barriers	“En dat krijg ik van management, maar van het team zelf ook niet. Dat krijg je niet tussen de oren.” (zelfsturing)
PZH8	Drivers	“die hebben wel al eerder met Agile methodes gewerkt voordat ze hier kwamen.”
	Drivers	“we moeten wat flexibeler gaan werken binnen de organisatie.”
	Current barriers	“in een ambtelijke organisatie zoals dit er heel erg hun best gedaan wordt om van alles alsnog een waterval te maken.”
	Current barriers	“Ik denk ook dat mensen. zich onvoldoende inlezen in wat goed werken voor een goede agile methode inhoud”
	Current barriers	“Product Owners moet ambtelijk iemand zijn met beslissings-bevoegdheid en dat is automatisch iemand die niet op de werkvloer zelf user stories schrijft”
	Current barriers	“want dan eindig je met 4 of 5 mensen die de titel Product owner hebben in een project.”
	Current barriers	“Sommige mensen zijn alleen bepaalde dagen beschikbaar.”
	Current barriers	“hele tijd van zijn werk af van het daadwerkelijk coderen”

Team	Code	Quote
	Current barriers	“ondanks het feit dat wij ondersteunend zijn aan hun moeten wij ze wel vaak vertellen wat wij denken dat zij nodig hebben.”
	Current barriers	“Nou ja officieel in de hele organisatie is er geen richtlijn voor Agile werken”
	Drivers	“elk team wat Agile wil werken, heeft zijn eigen vrijheid om het in te vullen naar hoe zij willen.”
	Current barriers	“Niemand weet van elkaar hoe ze werken”
DH1	Current barriers	“Dat was herbouw van hun platform dus ook iets wat echt gewoon goed planbaar is.”
	Current barriers	“niet echt een product aan het ontwikkelen of bezig met prioritering van klantwensen op business value.”
	Drivers	“Het voordeel van 1 scrum master voor alle 3 de BI teams is ook dat daarmee de samenhang in werkwijze van de 3 teams wordt gestroomlijnd.”
	Current barriers	“met 13 personen. Waarschijnlijk gaat dit team nog wel wat groter worden”
	Current barriers	“Het is lastig om binnen een sprint iets af te ronden en op te leveren, zeker als je nieuwe data moet onboarden in het datawarehouse.”
	Drivers	“Het management doet heel hard mee en doen hun best om het goede voorbeeld te geven.”
	Current barriers	“er ook nog wel wat moet gebeuren in de invulling van de scrum master en product owner rollen. Die zijn nu vaak parttime ingevuld”
	Drivers	“mensen werken hier van nature graag samen en zijn bereid elkaar te helpen.”
	Drivers	“Omdat alle teams serieus omgaan met hun retro’s, komen die punten wel goed naar boven en kan ik met de teams zelf op zoek naar verbeteracties.”
	Current barriers	“dat je wel heel veel laagjes management hebt in zo’n organisatie.” (traag)
DH2	Drivers	“Het voordeel van 1 scrum master voor alle 3 de BI teams is ook dat daarmee de samenhang in werkwijze van de 3 teams wordt gestroomlijnd.”
	Current barriers	“Dus wat je ziet, is dat wij als BI vaak niet direct met de gebruikers schakelen”
	Current barriers	“we werken Agile, maar de inrichting van de teams over de organisatie heen is nog erg competentie gericht.”
	Current barriers	“volgt qua teamindeling eigenlijk nog teveel de hiërarchische lijn om het echt efficiënt te laten werken.”
	Drivers	“Er is een transitieteam. Die pakken de implementatie van Agile In dat team zit een aantal Agile coaches”
	Drivers	“als we informatieproducten maken op basis van data die al beschikbaar is in het datawarehouse, dan valt er heel goed Agile te werken.”
	Current barriers	“Daarnaast zijn er veel management lagen die zich ook actief bemoeien met de (portfolio) planning en de uitvoering.”
	Drivers	“Het management doet heel hard mee en doen hun best om het goede voorbeeld te geven.”
	Current barriers	“er ook nog wel wat moet gebeuren in de invulling van de scrum master en product owner rollen. Die zijn nu vaak parttime ingevuld”
	Current barriers	“lastig is om focus aan te brengen.”
	Drivers	“mensen werken hier van nature graag samen en zijn bereid elkaar te helpen.”

Team	Code	Quote
	Drivers	“Omdat alle teams serieus omgaan met hun retro’s, komen die punten wel goed naar boven en kan ik met de teams zelf op zoek naar verbeteracties.”
	Current barriers	“dat je wel heel veel laagjes management hebt in zo’n organisatie.” (traag)
DH3	Drivers	“Het voordeel van 1 scrum master voor alle 3 de BI teams is ook dat daarmee de samenhang in werkwijze van de 3 teams wordt gestroomlijnd.”
	Drivers	“Omdat alle teams serieus omgaan met hun retro’s, komen die punten wel goed naar boven en kan ik met de teams zelf op zoek naar verbeteracties.”
	Current barriers	“Dus wat je ziet, is dat wij als BI vaak niet direct met de gebruikers schakelen”
	Current barriers	“we werken Agile, maar de inrichting van de teams over de organisatie heen is nog erg competentie gericht.”
	Current barriers	“volgt qua teamindeling eigenlijk nog teveel de hiërarchische lijn om het echt efficiënt te laten werken.”
	Drivers	“Er is een transitieteam. Die pakken de implementatie van Agile In dat team zit een aantal Agile coaches”
	Drivers	“Binnen de gemeente zijn we nu vanuit het transitie team aan het kijken hoe deze service-gebaseerde processen opnieuw kunnen worden ingericht met ITIL.”
	Current barriers	“alles naar Agile over te zetten. Je ziet daarmee dat bijvoorbeeld service-gebaseerde processen daar niet beter van worden.”
	Current barriers	“Daarnaast zijn er veel management lagen die zich ook actief bemoeien met de (portfolio) planning en de uitvoering.”
	Drivers	“Het management doet heel hard mee en doen hun best om het goede voorbeeld te geven.”
	Current barriers	“er ook nog wel wat moet gebeuren in de invulling van de scrum master en product owner rollen. Die zijn nu vaak parttime ingevuld”
	Current barriers	“lastig is om focus aan te brengen.”
	Drivers	“mensen werken hier van nature graag samen en zijn bereid elkaar te helpen.”
	Current barriers	“dat je wel heel veel laagjes management hebt in zo’n organisatie.” (traag)
DH4	Current barriers	“we werken Agile, maar de inrichting van de teams over de organisatie heen is nog erg competentie gericht.”
DH5	Drivers	“We hebben product owners, scrum masters, portfolio managers, PI planning, etc.”
	Current barriers	“volgt qua teamindeling eigenlijk nog teveel de hiërarchische lijn om het echt efficiënt te laten werken.”
	Current barriers	“De andere teams (Urban Data Platform en WOO) ondersteun ik wat beperkter.”
	Drivers	“Er is een transitieteam. Die pakken de implementatie van Agile In dat team zit een aantal Agile coaches”
	Current barriers	“Daarnaast zijn er veel management lagen die zich ook actief bemoeien met de (portfolio) planning en de uitvoering.”
	Drivers	“Het management doet heel hard mee en doen hun best om het goede voorbeeld te geven.”
	Current barriers	“er ook nog wel wat moet gebeuren in de invulling van de scrum master en product owner rollen. Die zijn nu vaak parttime ingevuld”
	Current barriers	“lastig is om focus aan te brengen.”

Team	Code	Quote
	Drivers	“mensen werken hier van nature graag samen en zijn bereid elkaar te helpen.”
	Drivers	“Omdat alle teams serieus omgaan met hun retro’s, komen die punten wel goed naar boven en kan ik met de teams zelf op zoek naar verbeteracties.”
	Current barriers	“dat je wel heel veel laagjes management hebt in zo’n organisatie.” (traag)
R1	Drivers	“eigenlijk heeft ledereenervaring met Agile werken”
	Drivers	“high performance team is eigenlijk een extra iteratie bovenop de scrum iteraties. Waarbij we meer op organisatieniveau proberen te kijken. Wat gaat er goed”
	Current barriers	“op dit moment elke app, heeft zijn eigen backlog”
	Current barriers	“en elke app heeft zijn eigen PO ook nog eens een bijzondere. In plaats van dat we die per team hebben.”
	Drivers	“we roosteren developers wel in ieder geval voor een week op een app”
	Current barriers	“dat zijn mensen die denken, oh maar PO, dat doe ik er even bi”
	Drivers	“De Po s die komen vanuit de business. Dus die hebben enorm veel kennis van wat de app moet kunnen.”
	Current barriers	“Agile werken in een waterval omgeving werkt gewoon niet zo goed”
	Drivers	“de afdeling heeft gezegd, wij werken scrum punt”
	Current barriers	“Er is gewoon heel veel weerstand, voornamelijk vanuit mensen die bang zijn dat hun baan verdwijnt.”
	Current barriers	“Als ik projectmanager zou zijn, wat is mijn rol dan nuwel?”
	Drivers	“Uiteindelijk werkt gewoon als mensen gezien hebben In de praktijk dat dat het effect heeft.”
	Current barriers	“proces zouden we een stuk efficiënter kunnen worden Als we gewoon een PO zouden hebben”
	Current barriers	“Mijn team is op dit moment groot, bestaat uit 13 developers.”
	Drivers	“De insteek om elkaar te helpen om En om iets moois te ontwikkelen voor de burger”
	Drivers	“We hebben een best wel open milieu gecreëerd bij bij de team”
	Current barriers	“die lagen, die beïnvloedt vooral qua snelheid het heel erg en dat is ook een frustratie, want we hebben het gevoel dat de mensen met wie wij praten niet het mandaat hebben om hun keuze te maken.”
	Drivers	“Als ik jouvandaageen berichtje stuur krijg je vandaag een antwoord.”
R2	Current barriers	“we te maken met een omgeving en dat zorgt ervoor dat we dus niet helemaal scrum kunnen werken.”
	Current barriers	“de gemeente Rotterdam geen Agile organisatie is, dus de rol product owner bestaat eigenlijk niet.”
	Current barriers	“in ons team zijn 10 apps en elke app heeft zijn eigen product owner”
	Drivers	“methode is die. goed werkt bij software ontwikkeling”
	Current barriers	“je bent zowel bezig met beheer en onderhoud als met door ontwikkeling”
	Current barriers	“als een belangrijk incident wat opgepakt moest worden, dan is het heel lastig om het sprint doel ook te halen”
	Drivers	“we hebben een 80, 20 indeling”
	Drivers	“We proberen, focus te creëren door de doorontwikkeling die we in die rol doen om dat aan één app tegelijk te doen.”
	Drivers	“ die meetings waardoor je. Best wel de afstemming hebt met elkaar”

Team	Code	Quote
	Current barriers	“er is wel weerstand tegen een nieuwe manier van werken inderdaad, in de managementlaag. ”
	Drivers	“je merkt dat er wel een drive is en mensen echt voor elkaar klaar staan”
	Current barriers	“als je die verantwoordelijkheden legt bij minder mensen of dus minder lagen.”

C

Survey questions

Q1: In which team are/were you working?

_____

Personal

Q2: How do you rate your experience with Agile work?

- Expert (1)
- Experienced (2)
- Somewhat experienced (3)
- Beginner (4)
- No experience (5)

Q3: The following questions are statements. Read the statement and indicate to what extent you agree with it. I enjoy helping others.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q4: I enjoy working collaboratively.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q5: I find the way our team works satisfying.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q6: I can easily focus on my tasks (i.e., not many distractions or different assignments at once).
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q7: It is clear to me what others in my team are working on.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q8: I constantly think about improving my work methods.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q9: Working with the current method is easy for me.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q10: I see added value in the current method.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Team mates

Q11: My teammates have a lot of experience with Agile work.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q12: My teammates are always ready to help.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q13: My teammates often think about improving the work process.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q14: My teammates are very motivated.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q15: I make sure team mates know what I'm working on or what challenges I'm facing.
- Strongly disagree (1)
- Somewhat disagree (2)
- Neither agree nor disagree (3)
- Somewhat agree (4)
- Strongly agree (5)

Q16: Our team achieves more success with this way of working.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Organization

Q17: I can determine for myself how I achieve my goal.
- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q18: Managers do not delegate enough responsibility to teams to make decisions.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q19: Critical thought has been given to our approach.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q20: The organization has a clear vision.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q21: The organization provides sufficient Agile training/coaching.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q22: The organization knows enough about Agile.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q23: There is good alignment on approach within the organization.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q24: More alignment among teams could improve the effectiveness of our approach.

- Strongly agree (1)
- Somewhat agree (2)
- Neither agree nor disagree (3)
- Somewhat disagree (4)
- Strongly disagree (5)

Q25: People's professional (or Agile) role within the organization is clear.

- Strongly agree (6)
- Somewhat agree (7)
- Neither agree nor disagree (8)
- Somewhat disagree (9)
- Strongly disagree (10)

Open questions

Q26 What do you consider the most important factor preventing you from working more Agile?

Q27 What has helped you the most in being able to work more Agile?

Q28 Do you experience resistance to an Agile approach from other parts (e.g., management or business) of the organization? If yes, what do you think is the reason for this resistance?

D

Archetype table with quotes

Team	Framework	Reason	Exp 1	Exp 2	Management	Quotes
PZH1	Water-Scrum-Fall	Adaptability/ structure	1	3	1/2/3/4	“Scrum achtig” “Omdat we ook niet volledig development team zijn” ...
PZH2	Scrum	Experimenting/ Structure	0	1	2/4	“De SM en PO zijn beginnend in hun rol.” ...
PZH3	Scrum	Ownership/ Openness	4	4	1/2/4	“We wilden sowieso open source gaan werken.” ...
PZH4	Traditional	Rebuilding	2	2	2/5	“8 maanden lang hebben we eigenlijk alles wat er al was hebben we opnieuw gemaakt” ...
PZH5	Scrum	Hype	5	4	2/3/4	“Scrum en Agile development is een beetje een hype” ...
PZH6	Scrum	Bridging	4	2	2/4	“Ik zit zelf een beetje buiten het scrum team” ...
PZH7	Scrum	Hype/External	5	4	1/2/3/4	“Een externe club mensen. Die op dat moment op deze manier werkten en die hadden met zich meegenomen” ...
PZH8	Water-Scrum-Fall	Adaptability	4	2	1/2/3/4	“Voor mij is dit het eerste traject” ...
DH1	Traditional	Management/ Rebuilding	3	4	5	“Wat zij deden was een heel stuk herbouw van hun platform dus ook iets wat echt gewoon goed planbaar is”
DH2	Scrum	Management/ Alignment	3	4	5	“Ook om de werkwijze over die teams heen wat te stroomlijnen”
DH3	Kanban	Management/ Flow	3	4	5	“Ben je dus een dag na de sprint planning met je serverice request dan moet je 3 weken wachten op de volgende sprint planning”
DH4	SAFE elements	Management/ Alignment	2	4	5	“Er is een transitieteam”
DH5	SAFE elements	Management/ Alignment	2	4	5	“Als je het gemeentebreed ziet werken we inderdaad eigenlijk over de hele gemeente gezien netjes conform SAFE”
R1	Water-Scrum-Fall	Management/ Fast software	2	3	1/2/4	“Word jij maar PO Dan kan je dat weer leuk op je cv zetten” ...
R2	Water-Scrum-Fall	Management/ Fast software	1	3	1/2/4	“Onzekere omgeving. Veel afhankelijkheden” ...

E

Drivers and barriers comparison including references

Table E.1: Comparison of drivers

Driver from literature	**Articles**	**Drivers from research**
Focus on individuals and interactions	McGregor and Doshi (2020); Mergel (2017)	Main drivers about people with Agile mindset
Working software over comprehensive documentation	McGregor and Doshi (2020); Mergel (2017)	
Customer collaboration	McGregor and Doshi (2020); Jovanović et al. (2020); Rigby et al. (2016); Mergel (2017); Vacari and Prikladnicki (2015)	
Flexibility and adaptability	Jovanović et al. (2020); Dunleavy et al. (2005); Mergel et al. (2018); Eilers et al. (2022)	Freedom to experiment
Enhanced communication and teamwork	Jovanović et al. (2020); Rigby et al. (2016); Chan and Thong (2009); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Ribeiro and Domingues (2018); Wisitpongphan and Khampachua (2016); Vacari and Prikladnicki (2015); Mergel (2017)	Shared SM Transition team Key role alignment Department commitment Stimulated safety and trust Faster communication Forced to trust Collaborating people
Previous experience	Jovanović et al. (2020); Mergel et al. (2018)	Similar to previous methodology Team experience
Highly competent people	Jovanović et al. (2020); Mergel et al. (2018); Dunleavy et al. (2005)	Team experience Dedicated key roles
Training	Jovanović et al. (2020); Rigby et al. (2016); Vijayasarathy and Turk (2012); Dunleavy et al. (2005)	Basic team training Dedicated Agile coaching Transition team
Multidisciplinary teams	Rigby et al. (2016)	Multi-disciplinary team
Autonomy for teams	Rigby et al. (2016); Stray et al. (2018)	Freedom to experiment

Continuous improvement (step-by-step)	Rigby et al. (2016); van Solingen (2020); Mergel (2017)	Transition team Improving mindset (process)
High motivation	Rigby et al. (2016); Eilers et al. (2022); Vacari and Prikladnicki (2015); Mergel (2017)	Motivated people
Knowledge sharing	Chan and Thong (2009); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016)	Shared SM Team experience Key role alignment Department commitment Faster communication
Management support	Chan and Thong (2009); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Vacari and Prikladnicki (2015); Mergel (2017)	Management leads by example Transition team Department commitment
Career advancement opportunities	Chan and Thong (2009)	
Alignment with organizational strategy	van Solingen (2020); Morley (2022); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016)	Structure Transition team Key role alignment Department commitment
Critical reflection on methods	McGregor and Doshi (2020); van Solingen (2020); Eilers et al. (2022); Riemenschneider et al. (2002)	Critical reflection on methodology Methodology fits activities
Open communication	Morley (2022); Eilers et al. (2022)	Stimulated safety and trust Open communication
Deliver value to customers/stakeholders earlier	Wisitpongphan and Khampachua (2016); Vacari and Prikladnicki (2015)	UX designers for user validation Faster communication
User engagement	Wisitpongphan and Khampachua (2016)	
High demands on digitization and user experience	Mergel et al. (2018)	Need for change in methodology Service-based processes
Increased demands on accountability and transparency	Mergel et al. (2018); Dunleavy et al. (2005)	Need for change in methodology
Encouraging innovation	Wilson and Mergel (2022)	Freedom to experiment
Promoting success	Morley (2022); Wilson and Mergel (2022)	Sharing success
Attitude towards learning spirit	Eilers et al. (2022)	Freedom to experiment Improving mindset (process) Open communication Critical reflection on methodology
Attitude towards collaborative exchange	Eilers et al. (2022)	Motivated people Collaborating people Willingness to help Stimulated safety and trust

Attitude toward empowered self-guidance	Eilers et al. (2022)	Critical reflection on methodology Improving mindset (process)
Attitude towards customer co-creation	Eilers et al. (2022)	UX designers for user validation
Job satisfaction	Vacari and Prikladnicki (2015)	
Alignment between IT and business objectives	Vacari and Prikladnicki (2015)	POs from business Cross-Functional PO
Promoting champions	Vijayasarathy and Turk (2012); Wilson and Mergel (2022)	Sharing success

Table E.2: Comparison of barriers

Barrier	**Articles**	**Context**
Overemphasis on processes and tools	McGregor and Doshi (2020); van Solingen (2020)	No critical reflection on methodology No sprint interjections
Documentation overload	McGregor and Doshi (2020); Mergel et al. (2018)	Inadequate documentation
Lack of collaboration	McGregor and Doshi (2020); Nerur et al. (2005); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Ribeiro and Domingues (2018)	No direct contact with user Lack of alignment between teams Ineffective management communication Bridge between business and IT
Outdated management styles	McGregor and Doshi (2020); Vacari and Prikladnicki (2015); Rigby et al. (2016); West et al. (2011)	Hierarchical time management Overinvolved management Waterfall management
Resistance to change	McGregor and Doshi (2020); Jovanović et al. (2020); Chan and Thong (2009); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015); Wisitpongphan and Khampachua 2016); West et al. (2011)	Lack of Agile knowledge in organization Resistance to change
Lack of management support	Jovanović et al. (2020); Chan and Thong (2009); van Solingen (2020); Morley (2022); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015); West et al. (2011)	Absence of Agile guidelines Lack of commitment in management Lack of ownership in management Resistance to change Ineffective management communication Decisions by non-technical managers

Lack of knowledge in management	Rigby et al. (2016); Jovanović et al. (2020); Chan and Thong (2009); van Solingen (2020); Morley (2022); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016); Ribeiro and Domingues (2018); Vacari and Prikladnicki (2015); West et al. (2011)	Hierarchical time management Overinvolved management Lack of Agile knowledge in organization Ineffective management communication Decisions by non-technical managers
Inadequate training and education	Jovanović et al. (2020); Chan and Thong (2009); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015); West et al. (2011)	Large tasks Absence of Agile guidelines Key roles experience deficiency Misunderstanding framework Team experience deficiency Lack of Agile knowledge in organization Multiple backlogs Basic key role training
Organizational culture misalignment	Jovanović et al. (2020); Chan and Thong (2009); Nerur et al. (2005); Vijayasarathy and Turk (2012); van Solingen (2020); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015)	Lacking external commitment Competence-based teams Hierarchical time management No direct contact with user Lack of alignment between teams Top heavy complex hierarchy Different methodology tech and business Decisions by non-technical managers Slow layered processes
Insufficient customer involvement	Jovanović et al. (2020); Wisitpongphan and Khampachua 2016)	Lacking external commitment No direct contact with user Lack of involvement from business teams
Lack of skilled practitioners	Rigby et al. (2016); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Stray et al. (2018); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Mergel et al. (2018); Vacari and Prikladnicki (2015); West et al. (2011)	Key roles experience deficiency Lack of Agile knowledge in organization Lacking capacity Business champions required No dedicated PO's

Difficulty scaling agile	Rigby et al. (2016); Nerur et al. (2005); Vijayasarathy and Turk (2012); Riemenschneider et al. (2002); Ghobadi and Mathiassen (2016); Nuottila et al. (2016); Ribeiro and Domingues (2018); Mergel (2017); Vacari and Prikladnicki (2015)	Competence-based teams Overinvolved management Service based processes PO's requiring official decision-making power
Career risks	Chan and Thong (2009)	
Underestimating transformation impact	van Solingen (2020)	Slow layered processes
Fear of failure	van Solingen (2020)	Responsible and deliberate governments
Big Bang Deliveries	Vacari and prikladnicki (2015); van Solingen (2020)	
Accountability paradox	Jos and Tompkins (2004); Baxter et al. (2023)	Responsible and deliberate governments
Legislation	West et al. (2011); Nuottila et al. (2016); Wisitpongphan and Khampachua 2016); Ribeiro and Domingues (2018)	PO's requiring official decision-making power Slow layered processes
Focus on stability and accountability	Mergel et al. (2018); Janssen and Van Der Voort (2016); Ylinen (2021)	Responsible and deliberate governments PO's requiring official decision-making power
Increased complexity of digital systems	Dunleavy et al. (2005); Nuottila et al. (2016); Wisitpongphan and Khampachua 2016); Ribeiro and Domingues (2018)	
Insufficient funding (for IT infrastructure)	Jovanović et al. (2020); Dunleavy et al. (2005); Mergel et al. (2017); Nuottila et al. (2016); West et al. (2011)	Lacking capacity
Lack of clear leadership and vision	McGregor and Doshi (2020); van Solingen (2020); Wilson and Mergel (2022)	Lack of ownership in management Lacking vision in management
Siloed organizational structures	Nuottila et al. (2016); Wilson and Mergel (2022)	Competence-based teams
Lack of agile mindset	Stray et al. (2018); Eilers et al. (2022)	No critical reflection on methodology
Relying on external resources	Nuottila et al. (2016); Mergel et al. (2018); Dunleavy et al. (2005)	
Lack of focus for teams (inexperienced POs)	West et al. (2011)	Unclear PO roles Multiple backlogs Lack of focus Clear direction Clear value No prioritizing required Predetermined scope Consistency issues