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Agile leadership in new software development contexts

Using agile leadership concepts to achieve organizational success in the context of enabling software development, in a new venture with legacies, and with multiple internal stakeholders

Master's thesis in Computer Science and Engineering

KLARA JAKOBSSON

TINA SAMIMIAN

Department of Computer Science and Engineering
CHALMERS UNIVERSITY OF TECHNOLOGY
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KLARA JAKOBSSON & TINA SAMIMIAN

Supervisor: Robert Feldt & Lucas Gren, Computer Science and Engineering
Industry Advisor: Andreas Sandberg
Examiner: Birgit Penzenstadler, Computer Science and Engineering

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Department of Computer Science and Engineering
Chalmers University of Technology
SE-412 96 Gothenburg
Telephone +46 31 772 1000

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Abstract

Leadership is a crucial element for project and organizational success. However, the implementation of agile frameworks can result in complex organizational mixtures with unclear role responsibilities. This study investigates the applicability and adaptability of agile leadership in new contexts, namely the development of enabling software products, new ventures emerging from larger traditional companies, and environments with multiple internal stakeholders. The agile leadership concepts are studied in an electric automotive company where all three contexts are present. Through a single-company case study approach with qualitative interviews, this research provides insights into challenges that arise in the three contexts and how agile leadership can be applied and adapted to overcome them. The findings highlight the need for adaptation of agile leadership concepts when working in a growing enabling software development department with multiple internal stakeholders that faces legacy issues from a parent company. Guidelines with specific recommendations for leaders and team members are developed and validated to support agile leadership. These guidelines offer practical guidance for improving the hybrid agile approach and the outcomes. The findings contribute to the understanding of agile leadership and emphasize the importance of agile leadership adaptation.

Keywords: Leadership, Agile leadership, Agile software development, Software engineering.

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1
Introduction

Agile methodologies have gained popularity in software development organizations in the last decade [1, 2]. This popularity can be attributed to the increasing complexity of projects and rapidly changing goals and business environments. Similar to Gren and Ralph's definition of agile software development [3], we include both the ideology defined in the Agile Manifesto [4] and the methodologies and processes that incorporate the manifesto, such as Scrum [2], Kanban [5], Extreme programming (XP) [6], Crystal [7], and Dual-track development [8]. We view agile as two-layered, with one layer being the work with tools, ceremonies, and physical set-up, and the other layer being leadership and how it empowers well-functioning high-performing teams. Agile teams are described as cross-functional and self-organizing in iterative loops towards common goals [9]. Appropriate and adaptive leadership behavior is a key success factor for evolving into an agile self-organized team [10].

Leadership is a crucial element for the success of projects and organizations [11]. However, agile methodologies prioritize a flat organizational hierarchy, de-emphasize management, and prioritize team empowerment [12]. In agile software development, leadership involves guiding team members to achieve the team's goals and is practiced by all teams, including self-organized and self-managed ones [3]. Effective leadership depends on team members' ability to identify with the group, take ownership of their actions, and be sensitive to cultural differences [3]. Sometimes, leadership work is undertaken by an outspoken leader, while at other times, it is dynamically shared between team members [3]. In Scrum, the most commonly implemented agile framework, leadership is shared between the product owner, the Scrum master, and the development team [13].

Research on leadership in software engineering, especially in the context of agile development, is limited [3]. A study of Microsoft managers by Kalliamvakou et al. concluded that there is still a lack of understanding about what makes a great software engineering manager and how to develop their skills to support their teams [14]. This highlights the need for further research in this area. A recent systematic review also emphasized the need for more empirical research on agile leadership to achieve a better understanding [15]. All three studies motivate the need for this research.

In many organizations, the implementation of agile processes results in complex organizational mixtures with unclear role responsibilities [16]. Additionally, expecting self-organization from teams without considering their maturity level can create

problems [16]. The applicability and adaptability of agile leadership concepts can also be challenging during agile transformations, especially in new contexts where there is no previous literature to learn from.

Leadership in agile methodologies encompasses various layers and aspects, lacking an exact definition as its core value lies in its ability to encourage agile work and fulfill necessary leadership functions [17]. In this study, we refer to leadership in agile software engineering as agile leadership concepts, to describe the phenomena and ideas related to leadership in agile frameworks and theory. These concepts comprise self-organizing teams, shared leadership, team maturity, and leadership functions implied by agile roles. Self-organizing teams are empowered to make decisions and manage their workflow, which fosters a sense of ownership and accountability [18]. Shared leadership distributes responsibilities across the team instead of centralizing them in a single role, resulting in better problem-solving and decision-making [19]. Team maturity assesses groups at different levels of development, allowing leadership to be adapted to enable teams to become highly-effective [16]. Leadership functions encompass desired aspects for organizing and enhancing work, which is implied by one or more leaders [3]. In agile methodologies, these tasks and responsibilities are addressed by roles such as Scrum masters and product owners.

Previous studies have primarily examined teams developing core software products in tech companies without complex stakeholder environments ([1, 3, 20, 13], among others). However, the development of software products in a non-software company presents new challenges. This raises the question of how well agile frameworks apply to the context of enabling software development. We define enabling software as software that is developed in a product organization with a non-software main business. The enabling software supports the core business but does not generate any revenue on its own. Additionally, small agile development teams often only have external stakeholders, but when belonging to a larger organization and receiving the majority of requirements from other internal departments, the stakeholder landscape can become vastly different. A third context that can affect agile development is when a new venture is founded by a larger company with a different culture and established processes and systems. In this case, there is a question of how much legacy is inherited by the new venture and its implications for agile leadership.

Agile approaches in software development are widely adopted and have been understood to a considerable extent since the introduction of the Agile Manifesto roughly two decades ago [21]. However, the concept of self-managed teams can be challenging to comprehend because agile teams require typical leadership tasks, such as coordinating interdependence and supporting team members' work to operate efficiently. A leader is often mistaken to be equal to a manager [22]. Although a facilitator may be present in a Scrum-based process, this role is explicitly excluded from planning activities and is somewhat external to the team.

Agile frameworks are adapted and interpreted differently in various contexts. In this study, we examine a company that exhibits all three of these contexts within its

organization. The study seeks to provide a deeper understanding of agile leadership in these new contexts and to assist agile teams in achieving success by presenting specific guidelines for handling situations in which leadership functions may falter. These guidelines are developed based on agile leadership and organizational research and are derived from phenomena observed in software development teams within the company.

1.1 Research questions

This study aims to address and answer the following research questions:

RQ1: How applicable are agile leadership concepts to new contexts? In particular:
(a) In the development of enabling software products
(b) For new ventures that spring from larger traditional companies
(c) When there are multiple internal stakeholders

RQ2: How can the agile leadership concepts be adapted? In particular for the three contexts in RQ1

RQ3: What would be concrete guidelines to support leadership when issues arise? In particular for the three contexts in RQ1

1.2 Delimitations

The empirical findings of this study should be considered within the context of some delimitations. It is delimited to examine agile teams and their corresponding leadership principles. This delimitation is justified by the educational and thesis requirements, as well as the need for a clear focus to achieve in-depth understanding, identify patterns, and comprehend fundamental causes.

The scope of this study is delimited to a specific IT department of the organization under examination. While a more comprehensive analysis of other departments could provide valuable insights, this research is focused solely on the specific IT department. It is acknowledged that exploring the other departments of the company could provide additional information, but such an investigation is beyond the scope of this study.

The scope is moreover delimited to not investigate whether any already existing scaled agile frameworks would suit the studied organization's needs. It rather focuses on the more high-level agile leadership concepts and how to apply and adapt them according to the organization-specific contexts. Some of the findings and proposed guidelines may interfere with an already defined framework, which would advocate for implementing it, however, the study explores balances of practices and values rather than any specific framework's suitability.

Additionally, as this research is based on a specific case, its findings may not be generalizable to other organizations. However, the objective of this study is to provide a deeper understanding of the phenomena rather than to draw general conclusions.

2

Related work

This chapter presents related work to the objective and the subjects under study. The fundamentals of agile software development are described as well as methods used to implement it. Agile leadership concepts are explained by presenting previous research on team maturity, shared leadership, self-organizing teams, and leadership functions implied by agile roles. Effective leadership and agile ways of working are covered to enrich the understanding of agile leadership. To better understand certain factors and the contexts of the study, scaled agile projects, hybrid project management approaches, organizational changes and culture, IT departments viewed as support, and managing multiple stakeholders are also covered. This chapter ends with a summary of the current state of knowledge, where what is known and not known in relation to our research questions is mapped out.

2.1 Agile software development

Agile software development is an iterative and incremental approach in which self-organizing teams collaborate and adapt to changing requirements [23, 24, 25]. The Agile Manifesto outlines the core values of agile methods, which prioritize: "Individuals and interactions over processes and tools", "Working software over comprehensive documentation", "Customer collaboration over contract negotiation", and "Responding to change over following a plan" [26]. West et al. [27] describe agile development as a collaborative approach to software delivery that requires team members to work together to solve problems.

There are various methods for implementing the Agile Manifesto, including Scrum [28], XP (Extreme programming) [6], Crystal [7], FDD (Feature driven development) [29], DSDM (Dynamic software development method) [30], and Adaptive software development [18]. Scrum is the most commonly used agile approach in companies and focuses primarily on project management [24]. According to this framework, the Scrum master is the agile leader who aims to empower the team to self-lead. Bäcklander [31] describes the Scrum master as an enabling leader without disciplinary power. However, empirical findings on such a leadership role are controversial, and the understanding of how leadership unfolds in a self-organizing team is still limited [16]. Further exploration is necessary to better understand leadership in agile teams

2.2 Effective leadership

Some researchers suggest a facilitating leader who serves as a peer to the agile team members [32], while others suggest a leader who empowers the team to lead itself [33]. Yet others suggest self-organizing roles within the team instead of any formal leader of the team [1]. What has also been found is that leaders adapt their behavior to the culture and structure of the company [34]. Gren and Ralph [3] suggest viewing agile leadership as a team property rather than a role. This depends on team members being considerate of cultural conflicts, identifying with the team, and being prone to take responsibility. They conclude that leadership involves balancing opposing organizational cultures, is dynamically shared among team members, and fosters a sense of belonging to the group.

In Gren et al.'s study [3] on effective leadership in agile teams, the interviewed leaders emphasized the importance of teams where everyone takes initiative. The participants valued teamwork skills more than individual performance. Initiative-taking individuals were described as fostering other members to take leadership initiatives and making shared leadership the norm. Besides having initiative-taking members, teams also need to feel heard and have autonomy for engineering practices as well as for organizational and team improvements. A successful leader steps back when there is a chance for shared leadership.

Similar to prior research on dysfunctional teams [35], Gren et al.'s interviews [3] revealed that one passive team member can ruin the effectiveness of the whole team. Another aspect brought up in the interviews was that team members are used to having a manager take responsibility for project failures. Changing their mindset about leadership can be challenging. Spiegler et al. [16] focused on teams' changing maturity to explain changes in leadership over time.

In their study on geographically dispersed teams, Polzer et al. [36] highlight the impact on leadership and teamwork. They find that team functioning declines with greater geographical distance, and conflicts and reduced trust tend to increase when teams are separated.

2.3 Team maturity

Spiegler et al. [16] cite Tuckman's forming-storming-norming-performing model to highlight that different leadership needs arise as teams mature. Gren et al. [34] suggest that immature teams require more structure and order, which agile leadership fails to provide, while mature teams are better at self-organizing, allowing the Scrum master to step back. Moreover, they note that understanding group dynamics and assessing team maturity is more critical in agile teams than in traditionally organized ones. Gren et al. [10] connect the constructs of agility and team maturity and conclude that agile teams adopt parts of team agility differently, depending on their group development stage. Their findings support that managing agile projects

must adapt to the group maturity levels of agile teams. One practical implication is that agile software development teams can use Wheelan's five-stage integrated model of group development (IMGD) [37] to increase their responsiveness to change.

Spiegler et al. [16] note that the Scrum guide lacks a crucial link to team mechanisms such as maturity and guidance for transitioning teams towards becoming agile. They also observe that the team development process takes time, and traditional views on hierarchy tend to remain in company culture, hindering the implementation of agile teams. In some organizations, a combination of Taylorism and agile can cause complexity. Not aligning responsibilities can lead to uncertainty about roles and responsibilities, and in a worst-case scenario, no one in the team takes on leadership roles, resulting in a leadership vacuum. Spiegler et al. [16] suggest that practitioners need to openly discuss roles and responsibilities and agree on specified owners for some tasks and shared ownership of others. They also recommend critically examining the existing structure and processes within an organization before implementing agile processes. Additionally, an agreement between management and the team on decision-making responsibilities can create a shared understanding of leadership within the agile team.

To cope with teamwork and group maturity, using tools that analyze group processes and propose interventions can be helpful. The group development questionnaire (GDQ), for instance, is a tool that surveys group members to investigate their maturity and generates insights into the team's status. Based on Wheelan's group development theory, the GDQ proposes interventions that guide the team in evolving to the next stage of Wheelan's development model. [38]

Delegating tasks in a virtual team can have varying effects depending on the team's maturity level [39]. In a mature virtual team, delegating more responsibility can lead to increased satisfaction among team members and better overall team performance. This is because recognition and delegation of responsibility fulfill workers' esteem needs and improve their motivation. When team leaders recognize the team's competency and delegate more responsibilities, it boosts the team's sense of self-worth, leading to increased motivation and harder work. However, in an immature virtual team, increased delegation can have negative effects. It can lead to decreased satisfaction among team members and result in worse team performance. Therefore, team leaders should be mindful of the team's maturity level and delegate responsibilities accordingly.

2.4 Shared leadership

Shared leadership can be incorporated by a leader who empowers a team to lead itself [33]. The term "super leadership" refers to such a leader. In such teams, leadership is distributed among team members. To achieve this in agile teams, rotational leadership was suggested as early as 1987 [33]. However, leadership development has been found to stem more from cognitive capacity than personal attributes [21]. While expertise-based leadership attributions are relatively stable when switching

tasks between team members, they can be influenced by interactions and skill judgments. Przybilla et al. [21] anticipate that individuals in agile teams will take on leadership roles based on cognitive ability and knowledge attributions. Shared leadership has been found to lead to increased participation and engagement among team members, improving communication and collaboration [13]. Shared leadership also enables teams to make quick and effective decisions, and to adjust to changing circumstances. One challenge for agile leaders is to determine when to step back and allow shared leadership to take over. Leaders may find it challenging to recognize when the team is ready for increased responsibility [3].

Shared decision-making is another key aspect of shared leadership. Poor communication and a lack of trust between team members and leaders are the main obstacles that can prevent shared decision-making and self-organizing [40, 19]. In addition, a lack of these elements can lead to undefined roles and responsibilities, inadequate support, and insufficient training, making shared decision-making even more challenging. Power imbalances can also occur in teams that practice shared leadership, leading some team members to have greater influence over decision-making than others [19]. Best practices for overcoming these challenges include setting clear goals and objectives, promoting open communication and transparency, and encouraging continuous learning and improvement. Addressing power imbalances and promoting an equitable distribution of decision-making power within the team is also important. The team should have a high degree of autonomy and decision-making ability, and the organization's culture should support and promote teamwork and collaboration. Lastly, companies should develop clear processes and procedures for decision-making and regularly offer opportunities for feedback and reflection [12, 19].

2.5 Self-organizing teams

Agile teams are said to self-organize [41, 42, 18, 2], which means that they manage their work internally and organize around tasks. The speed and accuracy of problem-solving increase when decision-making is brought to the operational level [40]. Self-organizing teams require shared focus, mutual trust, and respect for each other [42]. A study of mature agile XP teams revealed that they are collaborative and self-organizing in nature [43]. Self-organization is one of the twelve principles stated in the Agile Manifesto, and it is claimed to produce the best software artifacts [18].

Przybilla et al. [21] describe two sets of obstacles to self-organization: enabling and implementing proper processes and understanding how self-organization produces important leadership outcomes. Simard and Lapalme argue that the definition of self-organizing in the literature on agile Scrum is vague [44]. They state that further investigation is required to understand how teams function internally and together with the rest of the company, particularly for mature and self-organizing teams. The Scrum literature's emphasis on self-organization alone may be a dead end that encourages poor team structure.

According to Simard and Lapalme [44], teams that self-organize manage their tasks through shared understanding, accountability, and predictability. An informal hierarchy may grow within a team over time, with more experienced team members dominating decision-making and undercutting the integrating factors. Simard and Lapalme recognize that in addition to status inequalities, which can weaken integrating conditions and lead to coordination problems, such dominance may also be accompanied by them. Status distinctions that prohibit acknowledgment hinder the development of accountability because it necessitates understanding shared duties. Low-status team members provide less feedback and ask fewer questions when working collaboratively, which limits the sharing of information and knowledge and thus limits the group's collective understanding. Hoda et al. [20] identified six roles that agile team members adopt to support their team's self-organization: Mentor, Coordinator, Translator, Champion, Promoter, and Terminator, which are described in detail in 2.9.

In the fast-paced, rapidly changing software development environment, self-organization is particularly important [40]. Moreover, self-organizing teams are more likely to be motivated and engaged, leading to higher levels of productivity and quality. Clear goals and objectives are crucial elements in creating successful self-managing teams [45]. These success factors, along with a high degree of autonomy and decision-making power, are vital in today's fast-paced business climate, making the team more adaptable and responsive to changing circumstances. Access to the expertise and guidance of more experienced team members is necessary to function as a self-organizing team to its fullest. Effective leadership within the team and from the organization as a whole allows for a well-operated self-organizing team [45]

2.6 Agile ways of working

Agile software development comprises methods that vary depending on the specific agile framework being followed. The adoption of agile methodologies presents several challenges, as it involves more than simply changing tools. The organizational and managerial perspectives are critical when implementing organizational change, such as adopting agile practices [46]. Despite agile ways of working being popular for software development, some suggest that traditional methods such as object-oriented or lifecycle-based development may be more suitable for certain projects or organizations. For instance, Boehm points out that "organizations must carefully evolve toward the best balance of agile and plan-driven methods that fits their situation" [47].

Tripp and Armstrong stress the importance of a customized approach to implementing agile methods that varies between different companies [48]. They highlight the need to understand the agile adoption process and suggest several approaches to achieve customized agile ways of working. The authors advise companies to prioritize the most pressing problems and the most urgent demands for agile work-ways before attempting to broaden adoption. In addition, they suggest that companies should determine the performance metrics they want to use to evaluate the effectiveness

of their agile method. The authors also discuss goal alignments and the risk that different teams' and team members' objectives may not align with the organization's goals, leading to a lack of compatibility. Hence, companies should provide teams with some flexibility so that they can adapt to their unique situations and determine how best to collaborate given their particular composition and the tasks at hand. According to Tripp and Armstrong's research, adopting many agile principles can increase performance. However, as more agile methods are embraced, performance may suffer due to the interaction between them. As a result, they advise teams to be cautious when determining which practices to implement.

Hidalgo's research focuses on the adoption of agile methods in distributed research projects [49]. Hidalgo found that although the implementation of agile methodologies was generally successful, there were obstacles and constraints regarding shared knowledge and consistent use of the Scrum framework. According to Hidalgo, the use of agile methodologies in research collaboration is most suited for organizations that operate in dynamic, complex environments and have some ability for self-organization. Additionally, integrating agile techniques in teams calls for high adaptability and "learn by doing" strategies. Hidalgo further emphasizes that the Scrum structure might backfire if applied too strictly or overly ambitiously. Throughout the research, certain difficulties in the application of agile approaches in distributed research projects were identified. One of the difficulties was striking a balance between the requirements for freedom and autonomy and the necessity to achieve results. Hidalgo found that achieving this balance relied heavily on leadership when the Scrum framework was applied. A lack of face-to-face meetings presented another difficulty by complicating self-organization. Furthermore, Hidalgo explicitly stated that relationships were highly valued and that a lack of trust could hinder the implementation of agile approaches.

Hoda and Murugesan conducted research on the challenges that self-organized teams face when managing projects at various levels, including the project, team, individual, and task levels [50]. They explored the interrelationships between these challenges and the context of agile teams. According to their findings, some of the difficulties arise due to the self-organizing nature of agile teams, which are expected to undertake tasks that were traditionally the sole responsibility of project managers.

At the project level, Hoda and Murugesan found that changing and delaying requirements significantly affect project delivery. At the team level, cross-functionality poses challenges in terms of efficient resource allocation. At the individual level, each member must take responsibility for their assigned tasks since autonomy is critical to all aspects of software project management. At the task level, the absence of acceptance criteria is linked to assessing whether the requirements have been met, and task dependency is related to the failure to identify dependencies during early planning sessions.

The concept of "Three Amigos" encompasses the primary perspectives utilized to evaluate a work increment before, during, and after its development [51]. These

perspectives entail the three parts: business, development, and testing. The business perspective is about understanding the particular problem that needs to be solved. The development perspective revolves around devising a solution to address the identified problem. It explores the methodologies and approaches that can be employed to construct an effective solution. The testing perspective raises concerns about potential outcomes and unforeseen circumstances that may arise throughout the process. It encourages an examination of the possible consequences that could manifest during the implementation and deployment of the solution. Individuals with these diverse perspectives should collaborate in order to establish a collective understanding of what needs to be done and reach a consensus on the criteria for determining successful completion. However, one does not need to stick with these three roles or the number of three participants in these meetings, it is encouraged to gather the relevant perspectives of the problem and solution. Wang et al. raised that the "three amigos" meeting can build a shared understanding between the perspectives that participate [52].

Hoda and Murugesan discovered that, in a self-organizing environment where team members and leaders share tasks, project management-related challenges affect all levels, and difficulties at one level can impact issues at other levels. For instance, lack of management support at the project level leads to decreased external autonomy at the individual level, and changing or delaying requirements at the project level adversely affect task estimation at the team level.

To address the problems associated with this type of multi-level project management, the authors suggest solutions such as planning to create a shared understanding of the product between the team and the stakeholders, which can help reduce the number of change requests. They recommend knowledge exchange to handle cross-functional team difficulties, where the team can increase confidence among its members by analyzing their strengths and weaknesses. Hoda and Murugesan also conclude that effective communication and coordination can facilitate successful project execution by enabling a more straightforward integration of agile practices and more accurate task estimation.

2.7 Scaled agile projects

Agile methods are well-suited for small projects [53]; however, their implementation in larger projects presents more challenges [54]. Despite these challenges, the proven benefits of agile methods have made them increasingly popular for larger projects and companies. Nevertheless, large-scale adoption of agile methods poses challenges, including the need for inter-team coordination and issues in interfacing with other organizational functions, which can increase the distance between development teams and stakeholders [55]. This trend towards large-scale agile adoption is evident [56]; yet, it is important to note that the adoption of agile development often requires a change in the whole organizational culture [57], which can be difficult to achieve. In larger organizations, more dependencies between projects and teams require more formal documentation, which can decrease agility [58]. More-

over, development teams must collaborate with other parts of the organization that are rarely agile, such as when the human resources department demands strictly specified roles for individuals [53] or when a change control board hampers continuous integration and refactorization [58]. An agile transformation affects not only the development teams but also management and business units. Management needs to adopt a new mindset and leave the traditional life-cycle models behind in favor of iterative and feature-oriented models [46]. The focus on long-term project planning also needs to shift to shorter-term planning [57] to incorporate agile values. However, this lack of planning can be problematic when relationships with businesses and customers are founded on long-term road maps. Stakeholders must be educated, and contracting practices need to be revised to enable operations that are planned for the nearest future [53]. As a solution, Boehm suggests that each organization should aim for a unique balance between agile and plan-driven models [47]. Dikert et al. define large-scale agile as "software development organizations with 50 or more people or at least six teams", where all people do not have to be software developers but need to collaborate. This definition includes companies where software development is the primary focus as well as the software development branches of corporations with other main focuses [55].

2.8 Hybrid project management approaches

Gemino et al. define a project management approach as "a set of principles and guidelines that define how a specific project is managed" [59]. The hybrid project management approach combines methods and processes from at least two different approaches, specifically combining an agile approach with at least one other approach. While traditional and agile project management approaches are well-established in research, the hybrid approach is emerging. Gemino et al. reported that as many as 50% of the projects in their study were categorized as a hybrid. Their findings demonstrate that a hybrid project management approach can produce the same quality and scope as traditional approaches without requiring additional time or budget, while simultaneously achieving as much stakeholder success as agile approaches. Moreover, project success is positively impacted by reduced complexity, the establishment of clear scope requirements, and a high level of stakeholder engagement. This supports the hybrid approach by creating clear scope requirements according to a traditional approach and maintaining a high level of stakeholder engagement through an agile approach. Gemino et al. state that "hybrid approaches are not a poor second choice, but rather a natural evolution in the expanding range of challenges in project management". They do not view the hybrid approach as a stage in the transition from one project management approach to another but rather as a representation of a more mature project management discipline that combines different approaches to achieve better outcomes.

West et al. predict that agile processes will become more about using a suitable combination of different approaches and practices depending on the situation, rather than applying a specific method such as Scrum [27]. The resulting hybrid approach will be more robust, flexible, and dynamically situation-based, rather than a static

process that assumes all problems to be alike. Additionally, these processes should expand from development to also include operations and business change. Among other practical implications, West et al. stress the importance of building shared business-oriented goals to ease the friction between the business and development side. Shared goals allow the teams to balance quality and functionality in software projects.

2.9 Leadership functions and roles

Self-organizing teams should not be leaderless and uncontrolled [42, 32]. Instead, agile leaders should provide feedback and subtle direction, rather than acting as traditional managers [60, 61, 32]. Agile leaders are often compared to sports team coaches who set direction, align people, obtain resources, and motivate teams [60]. The agile leadership roles outlined in the Scrum respectively XP frameworks are Scrum masters [2] and XP coaches [62]. A Scrum master's role is to protect their team from external disturbances [40, 63, 2], such as unrealistic customer demands or insufficient tools, and ensure the team's efficiency and adherence to Scrum processes [2]. The role should focus on facilitating rather than organizing or managing the team [28]. XP coaches are also encouraged to step back as soon as possible and lead the team towards self-organization [62].

Agile methods require a shift in the project manager's role from controlling and planning to facilitating and collaborating [46]. Moe et al. [64] found that the product owner and Scrum master initially reduced team leadership, i.e., the leadership shared between the three Scrum roles; Scrum master, product owner, and team member, by controlling team members and not listening to their concerns. However, team leadership improved over time thanks to team members taking on more responsibility as the team matured. The authors also concluded that teams need management support and resources to grow into self-organization. Since most agile practices are team-based, the agile approach increases the importance of well-functioning teams.

Gandomani et al. raised the question of the relevance and presence of a project manager in agile teams [65]. Their findings indicate that while there is no distinct position in agile techniques known as a project manager, there is still a demand for it. If such a role existed, it would be structurally distinct from the conventional project manager role in terms of obligations and tasks. Their findings demonstrate that in software teams without a project manager, agile roles often handle project manager responsibilities. In Gren and Ralph's study, some agile leaders stated that strong and formal leadership roles hinder self-organization and shared leadership [3].

Previous research suggests that agile leaders should step back, based on several findings. Moe et al. discovered that occasionally absent Scrum masters increase information sharing between team members[64], which Bäcklander later recommended as a way to improve teamwork [31]. Spiegler et al. found that the Scrum master role provides a leadership gap by creating a non-hierarchical space where developers take

the lead depending on the situation [16]. This gap can be intentionally created by the Scrum master by stepping back, or it may occur unintentionally by the Scrum master's absence. The gap should ideally increase as the team matures. The Scrum master needs to balance between performing different leadership roles and letting other team members take on these roles. The team's willingness and capability to take on leadership roles are crucial in determining an appropriate gap size.

As earlier mentioned in 2.5, Hoda et al. found six informal, organizational roles that make the agile development teams self-organizing [20]. These roles were not assigned or known within the team but identified besides their formal roles. Some were played by agile coaches, while others were played by developers or business analysts. One person can have several informal roles, but the role is only played by one person at a time. The informal roles are described as follows:

(1) *Mentor*, who encourages the team to adhere to agile practices through guidance, understanding, and confidence in the agile methods.
(2) *Co-ordinator*, who coordinates communication and requests between the customer and the team.
(3) *Translator*, who translates the team's technical language into the customer's business terminology, and vice versa, to improve communication.
(4) *Champion*, who has the management's support to start pilot teams and promotes more self-organized teams in the organization.
(5) *Promoter*, who contributes to making the agile teams work by fostering customer collaboration and involvement.
(6) *Terminator*, who cut the team members that hinder the team's productivity by not fitting into the agile methodology.

To enable the team to take on leadership roles, Spiegler et al. encourage the organization to adapt its processes and requirements to the agile approach[16]. Alternatively, they suggest making the Scrum master responsible for project management activities. They stress the importance of a common understanding of leadership in agile teams within the organization and clearly communicated expectations. Otherwise, they argue that teams may become frustrated due to conflicting expectations regarding the agile way of working.

In Lambert's study on the implications of having too many leaders in a company [66], several downsides are highlighted. Firstly, an excessive number of leaders increases bureaucratic burden within the organization. Secondly, overpaying leaders leaves less profit to be distributed per employee. Lastly, Lambert argues that an abundance of managers can result in a higher proportion of people being employed in the non-productive sector of the company, such as advertising, public relations, and promotions.

2.10 Organizational changes and culture

Duvall-Dickson identifies loss of confidence in management, cynicism, distrust, diminished morale, reduced loyalty, and loss of control as some of the unanticipated psychological consequences of mergers and acquisitions [67]. These consequences can be partially explained by the fact that organizations, like individuals, are bound to history. When new employees join a company, they become a part of the history that founded it while also contributing their own history. As organizations expand and merge, their internal and external relationships evolve, requiring employees of an acquired company to renounce their habits and culture and adopt the culture of the acquirer. Just as a culture loses a portion of its identity when it loses its traditions, the same is true with a corporation.

2.11 IT departments viewed as support

Luftman argues that IT departments should be viewed as facilitators of corporate strategy, rather than just a support function [68]. To ensure that IT investments are yielding a return on investment, business strategy and IT should be closely correlated. To set business goals and identify opportunities for utilizing IT to achieve those goals, Luftman suggests that business and IT leaders collaborate and align their objectives [68]. Devaraj and Kohli note that IT investments can lead to increased efficiency and productivity, better decision-making, and improved customer service for companies, given that they are used effectively [69]. However, the relationship between IT investments and business value depends on several factors, such as industry context. Companies must combine financial indicators, such as return on investment, with non-financial criteria, like customer experience and employee productivity, to assess the economic potential of IT investments [69].

Weill and Ross suggest that IT should not be viewed as a support role, but rather as a business asset that can provide value to the company [70]. IT investments should be prioritized based on their strategic relevance, and IT decision-making should align with business decision-making. Similarly, Prahalad and Hamel argue that IT should not be seen as a separate role, but should be integrated into business processes and decision-making [71]. They emphasize that organizations should focus on developing organizational frameworks and procedures that support the growth and application of core competencies, including IT.

2.12 Managing multiple stakeholders

According to Freeman et al., any group or individual who can affect or be affected by an organization's objectives is a stakeholder [72]. Schibi emphasizes that successful IT project management requires managing stakeholder expectations [73]. Schibi also argues that IT project managers need to be informed about stakeholder requirements in addition to the project's goals, scope, budget, and schedule. To effectively manage stakeholder expectations, IT project managers can use a knowledge-based

framework that consists of four key pillars: stakeholder analysis, communication planning, risk management, and change management. Stakeholder analysis involves identifying stakeholders, evaluating their influence and interests, and creating engagement strategies. A communication strategy includes establishing appropriate channels for communication and addressing feedback. Risk management requires identifying, assessing, and mitigating risks that could impact stakeholder expectations. Change management includes anticipating and managing changes that could affect stakeholder expectations, as well as ensuring that stakeholders are informed and involved in the change process. Schibi claims that this framework can help IT project managers achieve project success by coordinating stakeholder expectations with project results, reducing disagreements and miscommunications, and fostering confidence and trust among stakeholders.

The historical approach to managing software development projects is based on a plan-driven model that assumes requirements can be precisely defined and anticipated, and that variations can be managed and monitored [74]. However, Highsmith argues that this strategy is not well-suited to the complex, dynamic, and unpredictable nature of software development projects. Instead, advocating for an agile approach, which emphasizes flexibility, adaptability, and responsiveness to changing demands and circumstances. This strategy is based on the agile manifesto, which values people and interactions, functional software, customer collaboration, and adapting to change. Highsmith suggests that agile project management techniques enable IT initiatives to respond to shifting stakeholder demands and conditions, as well as adapt to changing consumer and market demands.

Freeman et al. also contrast stakeholder management with conventional approaches [72]. They argue that conventional strategic management methods prioritize maximizing shareholder value and assume that the company's interests should be the only ones taken into account. This approach is flawed because it overlooks the contributions and interests of other stakeholders, such as the environment, communities, customers, suppliers, and employees. In contrast, a stakeholder perspective requires the company to define, value, and manage its relationships with stakeholders in a way that benefits all parties and minimizes risk. Donaldson and Preston propose the stakeholder theory of the corporation, which posits that the company's purpose is to create value for all its stakeholders, not just shareholders [75]. This theory recognizes the interdependence and ethical obligations between the company and its stakeholders and emphasizes the importance of stakeholder engagement and participation in corporate decision-making processes. The theory implies that the long-term success of a company depends on its ability to create value for all stakeholders.

2.13 Summary and missing work

This section provides a summary of the current state of knowledge in relation to the research questions. The presented related work covers much of the agile leadership concepts this study focuses on, namely self-organizing teams, shared leadership, team maturity, and leadership functions implied by agile roles. However, there is

a gap in understanding the applicability of these concepts and how they can be adapted within the three specific contexts addressed by the research questions.

In terms of self-organizing teams, the literature establishes the link between agile and other agile leadership concepts. It also explores the means by which self-organization can be achieved and identifies previous challenges encountered in this area. However, there is a lack of literature on how self-organizing teams function internally and together with the rest of the company. The existing body of work broadly covers shared leadership and its implications, including its relation to decision-making processes, role definitions, communication, collaboration, and transparency. Regarding team maturity, the literature explains the connection between team maturity and agile leadership, recognizing that different leadership approaches are required as teams progress. Additionally, it emphasizes the importance of understanding group dynamics and assessing team maturity in agile teams. In terms of the fourth concept, leadership functions implied by agile roles, the related work presents diverse perspectives on what makes an effective agile leader. It also delves into how leadership can be distributed among different agile roles. Furthermore, addressing how an agile leader should act and how a leadership gap can facilitate shared leadership.

Shifting the focus to the three specific contexts, what is known are some previous findings that can help understand the context-specific aspects to consider when applying agile leadership concepts and striving for overall improvement within these contexts.

For the first context, enabling software development, section 2.11 highlights the challenge faced by IT departments in being perceived as support functions rather than valuable business assets. Existing literature addresses leadership within this context by emphasizing collaboration and goal alignment between business and IT leaders. However, there is a lack of literature specifically addressing the implications of agile leadership concepts in this setting. Regarding new ventures with legacies, the literature gap is more pronounced. Section 2.10 briefly mentions the consequences of mergers and acquisitions, which is used to describe the cultural part of the legacy of another company. Previous work on legacy systems, tools, and data connected to agile leadership was however not found in the literature search. For the third context of multiple internal stakeholders, the literature in section 2.12 discusses the importance of stakeholder management and the need to manage stakeholder expectations. It compares traditional management approaches, which are based on a plan-driven model that assumes precise and anticipated requirements, with agile project management techniques that enable IT initiatives to respond to shifting stakeholder demands. However, the literature does not specifically address the dynamics and challenges associated with managing multiple internal stakeholders, such as different departments, teams, or individuals within an organization. Furthermore, the existing literature lacks specific discussions on the implications of agile leadership concepts within this context.

With this related work and research gaps in mind, our study aims to bridge the

gap by linking agile leadership concepts with the three specified contexts and building upon the knowledge of previous studies.

3
Method

This chapter details the procedures conducted to address the research questions. First, the organization unit where the study took place is presented and information about this case is provided. Then the data collection is presented by describing the participants, the group interviews, individual interviews, and the static validation of guidelines. Thereafter, the method for data analysis is described, followed by ethical considerations.

3.1 Description of the case

The research questions were addressed by examining a specific department of an innovative electric automobile company, referred to as PowerRide, which was founded and is partly owned by DriveForce, another automobile company. The company names PowerRide and DriveForce are fictional and have been used for non-disclosure reasons. PowerRide is currently in the scale-up phase, and many of its employees previously worked at DriveForce. It is uncertain how many legacy practices PowerRide has inherited from DriveForce.

While PowerRide aims to work agile, they have not fully implemented any specific framework. How different teams work and to what extent the organization is agile is currently unknown.

The specific department under study is referred to as ”Digital”. Digital is responsible for developing IT solutions and marketing products that support PowerRide’s primary business. In this report, we refer to their products as ”enabling software”. Although the software produced by Digital is crucial for the company, it is not part of the core product and does not generate revenue on its own. Other parts of the organization request services from Digital, often treating them as traditional IT support. In contrast to the current state, Digital aims to work more autonomously and direct its work, despite the numerous internal stakeholders involved.

Digital aims to adopt a tailored agile approach, where the general guideline is for each team to consist of at least one digital lead and one technical lead. PowerRide has defined these roles, where the digital lead ”owns the vision and roadmap for one to two digital teams and is accountable for planning and execution”. The technical lead is defined as ”responsible for the daily execution and planning within their digital team, including team performance”. Furthermore, the teams belong to different

digital product areas, where all teams within an area share a digital product manager (DPM), who is described as a ”line manager for all team members and responsible for defining the vision and goals for a digital product area”. Although Digital is just one of eight departments at PowerRide, the employees at Digital have developed an informal term to collectively refer to their internal stakeholders at the company. This term, widely recognized but unofficial, is ”Business”, which encompasses the other seven departments, such as Marketing & Brand, Sales, and R&D. All these Business teams are located in the headquarters, which is a different site than Digital's. Figure 3.1 shows a simplified overview of the PowerRide organization, where the division between Digital and Business is visualized.

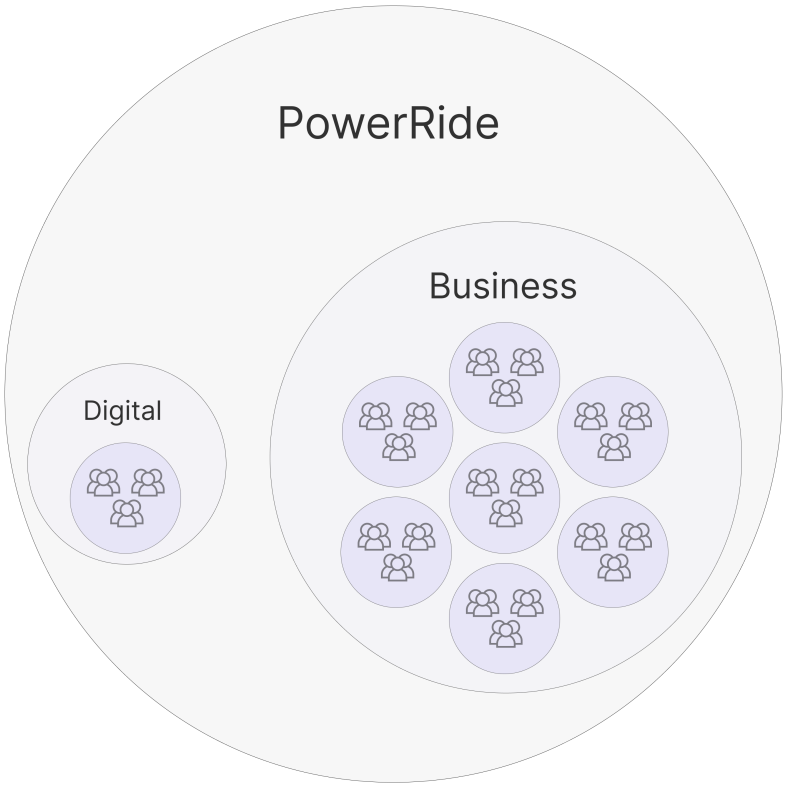

Figure 3.1: Simplified figure of the PowerRide organization and the division of teams and departments in the two units. The purple circles visualize the eight departments and the people represent that there are several teams within each department.

3.2 Data collection

The primary data source was a series of interviews conducted in three rounds. The first round took place in groups, while the second and third rounds were conducted individually, with the latter being more like a review and referred to as ”static validation”. Figure 3.2 provides an overview of the study design, which depicts the main stages of the method.

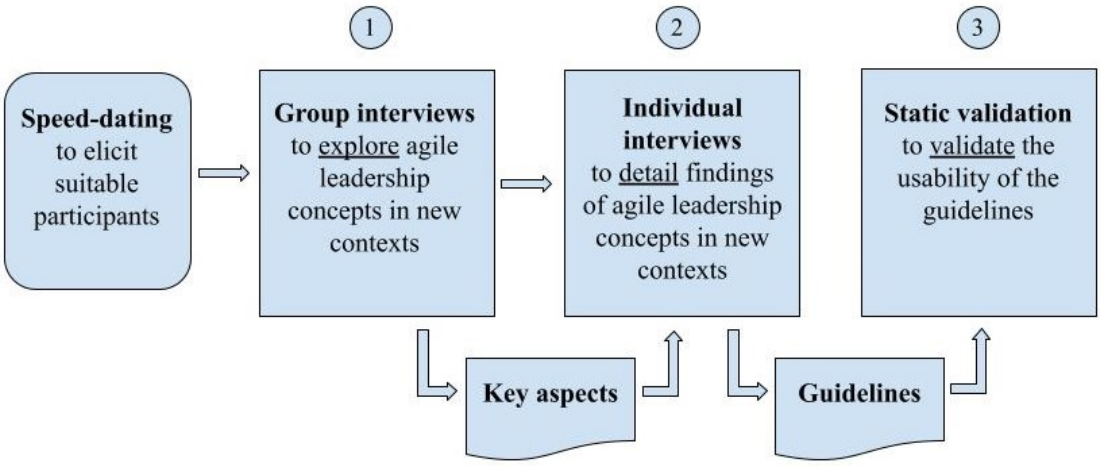

Figure 3.2: Flow chart of the method stages.

Before the interviews, the participants were reminded of the anonymity and confidentiality of the study, as well as its purpose, following the recommendations of Hove and Anda [76]. This introduction to the interviews can be found in Appendix A. Additionally, to promote a relaxed interview setting, informal conversation was encouraged and a variety of open-ended questions were introduced, following Hove and Anda's recommendations [76]. With permission, all interviews were audio recorded for transcription purposes.

The initial two rounds of interviews were conducted using a semi-structured format. As suggested by Hove and Anda [76], a set of predetermined questions was prepared to elicit anticipated information, along with some open-ended questions and discussion topics to uncover unexpected insights. The predetermined questions were derived from a set of themes to ensure consistency and comparability of responses across the interviews, while follow-up questions were formulated on-the-fly based on the interviewee's responses. During the group interviews, participants were encouraged to engage in discussions and elaborate on the topics under discussion. To effectively gather information, probing and prompting techniques were employed during the interviews [77, 78], such as asking "Tell me more..." to prompt further elaboration. All interviews were conducted by both researchers, which offers several advantages as suggested by Hove and Anda: (1) two interviewers generally ask more questions than one, thereby collecting more information, (2) dividing the responsibilities enables a better flow of follow-up questions, and (3) the probability of accurately understanding the subject increases when the two interviewers can interpret what is said and discuss it afterward [76].

The interview questions focused on themes based on the research questions outlined in section 1.1. To gain a better understanding of the participants and their educational and professional backgrounds, the interview began with some simple introductory questions. The first key topic that emerged pertained to team compo-

sition and leadership. This included questions about potential self-organization, the team's level of agility, the presence of shared leadership, and the team's maturity. The second theme highlighted potential leadership challenges. The following three themes corresponded to the three contexts described in research questions 1 (a), (b), and (c), namely the development of enabling software products, new ventures that spring from larger traditional companies, and when there are multiple internal stakeholders. The final topic addressed other potential contexts that might impact Digital's agile leadership.

In the third round, the developed guidelines were statically validated, wherein a selected group of individuals were handed the guidelines, and their perceptions of their relevance and usefulness were gathered through a couple of questions.

3.2.1 Participants

Before the study started, ten software development teams that work agile to some extent were said to be available for the study. The first step was to invite the leaders of the teams, who held titles such as digital or technical lead, to a meeting called "speed-dating". During these meetings, the study was presented, and the suitability and interest of the leaders and their teams in participating were discussed. This process led to interview bookings with a total of eight leaders, which met the study's target number. Subsequently, messages were posted on the internal communication channel to reach team members for the interviews and encourage them to participate. While finding team members who volunteered was more challenging than leaders, six team members were eventually recruited for the interviews. For the static validation of the guidelines, interested employees were contacted by email to participate. Each person only participated once in the first two interview rounds, but all interviewees, along with additional participants, were invited to participate in the validation.

All participants were given a chance to see and correct the results of the interview. An email was sent with the results from the specific interview they participated in before it was included in the report. This step increased the reliability of the results as faulty statements could be corrected, as well as ensuring the participants were comfortable with the included information.

3.2.2 Group interviews

In the first round of interviews, four group interviews were conducted comprising two to three individuals each. Two of the groups consisted solely of leaders, while the other two groups comprised only team members. The leaders' groups consisted of roles similar to Scrum masters, product owners, and team leads. Meanwhile, the team members' groups comprised developers, business analysts, and other titles within the team without leadership responsibilities. This division was made to gather data from both the leaders' and team members' perspectives and to encourage honest thoughts and opinions without worrying about expressing criticism toward

another level of the hierarchy. Results from this part of the process were important in exploring the applicability and adaptability of agile leadership in new contexts and formed the key aspects.

3.2.3 Individual interviews

In the second round, individual interviews were conducted with four participants, consisting of two leaders and two team members. The interview questions were derived from two perspectives. Firstly, to address any gaps in knowledge regarding our research questions. Secondly, questions were developed based on the results of the first interview round and designed to elicit in-depth responses. Additionally, this round was more open to letting the interviewee lead the conversation and the interview questions were used as support rather than rigidly following them. The results of the second round of interviews yielded a more profound comprehension of the case under study and facilitated the development of guidelines.

3.2.4 Static validation

In the third and final data-collecting method stage, five individuals with various titles were employed to assess the relevance and applicability of the guidelines. This validation aimed to determine the usefulness of the concrete guidelines. The participants were provided with a study description, an explanation of anonymity, and the guidelines. They were encouraged to respond via email with answers to two questions, as well as any additional reflections.

3.3 Data analysis

To draw conclusions regarding leadership and the applicability of agile methods within the studied teams, the collected data from the entire process were analyzed and compared with internal documents and existing theories. All interviews were recorded and transcribed. The transcripts were analyzed, and relevant materials were extracted and grouped into analytical themes, one interview at a time. This analysis was conducted concurrently by both researchers to increase reliability. Each researcher proposed a theme for a text section, which was subsequently discussed to determine the most accurate description. After the first round of interviews was conducted, the themes identified in each interview were compared, and the material was iteratively examined to identify common patterns and recurring topics. Based on this analysis, the themes were reviewed and revised to prioritize consistency. For instance, if one interview referred to a theme as ”Goals” while another used ”Objectives”, the terminology was standardized to facilitate comparability. The same analysis process was applied to the second round of interviews.

Based on the data analysis from the first round of interviews, a set of key aspects were identified. These key aspects were utilized to prepare questions and discussion topics for the second round of interviews. To ensure a systematic analysis, the key aspects were grouped together based on common themes. These groupings, along

with the results from the second interview round and relevant literature, were used to develop the themes that formed the guidelines that address RQ3. Additionally, the responses from the static validation of the guidelines' relevance and usefulness were analyzed and mapped into tables.

The findings from the two interview rounds were also used to answer RQ1 and RQ2. The discussion primarily focused on elucidating the findings and implications of the study by linking the results with relevant theory. This study is aimed at providing a comprehensive understanding of a particular phenomenon in a specific context, rather than generalizable findings, following a case study approach [79].

3.4 Ethical considerations

During the planning and analysis phases of the interviews, the guidelines for ethical interviews in software engineering presented by Strandberg have been followed [80]. However, there is always a risk when studying real situations and individuals. In this study, the interviews were particularly sensitive, as a participant's answer could potentially be disapproved by their manager, leading to disadvantageous consequences for the participant. Additionally, participants may have experienced pressure during group interviews or other situations that made them feel uncomfortable.

4

Results

This chapter presents the findings of our study that explored PowerRide Digital employees' experiences and perspectives on agile leadership in new software development contexts. The study was conducted through group and individual interviews, and the data was analyzed by categorizing responses into common themes and patterns that emerged during the interviews. To ensure anonymity, we assigned fictional names taken from the television series *The Office* to refer to interviewees in the following sub-sections. Table 4.1 displays the assigned fictional names of interviewees, along with their high-level roles, the interview they participated in, their tenure at PowerRide, and any prior work experience from DriveForce. The fictional names were assigned before meeting the interviewees, and the gender of the fictional character does not necessarily match the interviewee's gender. It is important to note that the attributes of the fictional characters do not reflect the personality or role of the interviewees.

Interview	Role	Fictional name	Time at PowerRide	DriveForce experience
Group 1	Leader	Michael	8 months	Yes
Group 1	Leader	Jim	1.5 years	No
Group 1	Leader	Dwight	3 years	No
Group 2	Leader	Pam	7 months	Yes
Group 2	Leader	Oscar	1 year	No
Group 2	Leader	Angela	10 months	Yes
Group 3	Team member	Erin	2 months	Yes
Group 3	Team member	Meredith	1 year	Yes
Group 4	Team member	Andy	8 months	No
Group 4	Team member	Phyllis	1 year	Yes
Individual 1	Leader	Stanley	1.5 years	Yes
Individual 2	Team member	Kelly	8 months	No
Individual 3	Team member	Darryl	1.5 years	No
Individual 4	Leader	Kevin	3 years	Yes

Table 4.1: Fictional names assigned to the participants and their professional experience.

4.1 Group interviews

Table 4.2 presents a comprehensive summary of the themes that emerged during the first round of interviews, which were conducted in groups. The table provides an overview of the key topics discussed by both leaders and team members (TMs) during the interviews. The themes in the table are categorized as either positive or negative. A theme was considered positive when an interviewee expressed positive thoughts about it, while negative meant that an interviewee identified problems with the current state of a theme. Only predominant opinions, either positive or negative, were included in the table. If an interviewee expressed both positive and negative thoughts, the more significant opinion was counted. It is worth noting that some themes had varying experiences among different interviewees, and each interviewee had different preferences regarding the state of a theme. Furthermore, not all themes are included in the results for all interviews, as some individuals did not provide any significant insights or thoughts on certain topics, resulting in a lack of relevant information.

Themes	Negative leaders	Positive leaders	Negative TMs	Positive TMs
Goals	4	2	1	1
Relation to Business	6	0	4	0
Roles	4	0	3	1
Scale-up company	3	0	0	1
Transparency	2	0	0	3
Task- or problem-based	2	1	0	0
Legacy	3	0	0	1
Documentation	0	1	2	2
Communication	0	1	1	2
Ways of working	2	0	2	0
Priorities	4	0	1	2
Sheltered by leader	0	0	0	3
Team maturity	0	2	2	2
Self-organizing	2	3	0	2

Table 4.2: Summarized themes that were brought up in the first interview round and the number of employees expressing negative and positive views of the current state of the themes.

4.1.1 Group interview 1 - leaders

Background

Michael holds an academic degree in media and has worked as an agile development leader for the last decade, including a short period at DriveForce. He is currently a digital lead at PowerRide, managing a team of eight individuals. Jim has a background in management and has worked in various positions within the e-commerce industry for the past 15 years. He joined PowerRide without any prior experience in the automotive industry and is currently a product manager, leading a team of 21 members. Dwight studied interaction design and began his career at PowerRide as a service designer three years ago. He was recently promoted to the position of roadmap lead, responsible for coordinating capacity and planning across the department. Dwight supervises a team of 18 digital leads.

Goals

Dwight asserts that the various departments operate with distinct goals, which results in misaligned efforts. He says that attempts to enhance collaboration between

Digital and Business are ongoing, but significant challenges remain. In particular, the process for establishing goals, visions, and strategies requires refinement. According to Dwight, without alignment with stakeholders, the departments lack a coherent plan. He advocates for a common overarching goal to drive the formation of sub-goals across departments, facilitating alignment and understanding of their collective aims. Dwight favors a top-down approach to goal setting, as opposed to a bottom-up process.

In addition to the lack of clarity regarding goals, there appear to be tensions between the goals of Digital and Business. While Digital strives to improve the customer experience, the Business unit prioritizes selling cars. As noted in the interview, Digital's products serve as enablers, making it difficult to measure the impact of their work in terms of car sales. For instance, reducing technical debt will not increase sales.

Relation to Business

Jim and Dwight agree that smaller teams with fewer stakeholders tend to have stronger connections with their stakeholders, as they have an easier time functioning as an actual team. Stakeholders outside of the day-to-day team may lack a clear understanding of the product and its vision. Dwight argues that Business fails to consider that Digital has several mandatory tasks, such as maintenance and security work, that require adequate time allocation. He highlights that the biggest challenge they face in terms of agile leadership is the waterfall approach from the Business side, adding: "We have several significant initiatives originating from the Business side that are frequently driven in a waterfall approach." Dwight also states that they strive to be agile within Digital but must also manage the needs of the Business side of the company. Michael describes how the Business side impedes Digital from self-organizing by requesting that they adhere to last-minute requests.

Roles

Dwight highlights that the issue of ownership is unclear within the organization. While some digital leads are aware of their boundaries and limitations, others are not. The same applies to other roles within the team, as per Dwight's observations. He explains that while the roles are formally defined, their application varies based on the team and its leader. Michael describes how he encountered a situation where he raised some concerns, but nobody opposed or provided any feedback.

4.1.2 Group interview 2 - leaders

Background

Pam has experience in her role as a DevOps lead in various automotive companies. Oscar is a security officer in the information security team and has previously worked with Pam in another automotive company. Angela has worked as a consul-

tant for DriveForce for eight years and now works as a digital lead.

Goals

After deliberations, Angela says that her team's goal is very clear, asserting that it is to create an exceptional customer experience. Nonetheless, Pam disagrees, arguing that there is a lack of key performance indicators (KPIs) and strategy breakdowns to guide them. After further discourse, Angela and Pam conclude that a shared vision and clearer definitions within the department and team are necessary. They posit that this would enable the team to collaborate toward their objectives without relying on individual interpretations. Pam acknowledges her ignorance of the team's stakeholders, only mentioning a Digital management team whose agenda she is not privy to. Angela proposes that epics should be shared between the teams to monitor the different contributions to the larger goals. Oscar and Pam assert that the organization's goals and visions are ambiguous.

Relation to Business

Pam and Oscar claim that there is a lack of comprehension from Business regarding the nature of Digital's work and the value it generates. Furthermore, they note that the objectives of Business and Digital are not aligned. They advocate for a cohesive vision that emphasizes the creation and upkeep of high-quality software as opposed to Digital being treated as a mere "feature factory".

Roles

Pam raised concerns about the number of people with the title "lead," which she believes could hinder autonomy and self-organization among teams. She questions why the company seems to be increasing the number of leads instead of developers. Angela notes that the roles at Digital are similar to those at DriveForce, but with different titles. Meanwhile, Oscar highlights issues with role responsibilities, expressing a desire for clear accountability among team members while still maintaining freedom in how they approach their tasks.

Scale-up company

Angela opines that PowerRide is still in its early stages of development, and as such, not yet a mature organization. She further highlights that the company differs significantly from DriveForce, with fewer vehicles on the road and in the process of being launched. Additionally, PowerRide's unique strategy of selling cars directly to customers sets it apart from other automakers. Pam suggests that the company's rapid expansion may contribute to the current lack of clear goals.

Transparency

Pam and Oscar raised their concerns about the lack of transparency at Power-

Ride. They have been unable to find any records of previous decisions or evidence of past meetings, despite transparency being one of the company's core values. Pam reflects on the possibility that this lack of transparency could be intentional, and Oscar expresses his desire for everything to be public from the start. Both Pam and Oscar think that everyone should be allowed to participate in any meeting they wish, a practice they have experienced in previous workplaces.

Task- or problem-based

According to Angela, her team follows a problem-based workflow, where they focus on addressing and resolving problems instead of predefined tasks. However, Pam and Oscar express disagreement, suggesting that the workflow Angela describes is more task-based than problem-based. Pam and Oscar believe that the current approach poses a challenge as it prioritizes tasks over solving problems. They express a preference for a problem-based approach where they are presented with problems to solve, rather than being assigned specific tasks without their input at the time of task creation.

Legacy

Pam believes that there is a significant influence from DriveForce on PowerRide, including inherited tools, support set-up, and communication practices. Angela confirms this by stating that they are even using some of DriveForce's plans for their cars. Pam expresses a concern that leaders might revert to old habits from DriveForce, both in terms of processes and administration, which could hinder innovation and progress at PowerRide. She suggests that PowerRide should capitalize on its unique identity rather than being perceived as a continuation of DriveForce.

Ways of working

Pam and Oscar hold similar views on whether the department adheres to the Agile Manifesto's value of prioritizing people over processes. Pam asserts that the department fails to follow this tenet. Oscar concurs with her and also contends that prioritizing processes over people can be detrimental to the workflow and overall objectives. To illustrate his point, he cites an instance where achieving a specific number of tests is not the end goal; rather, delivering high-quality software is, and prioritizing processes over people could compromise this goal.

4.1.3 Group interview 3 - team members

Background

Erin, who holds a degree in computer science, worked as a consultant at DriveForce before starting her current role as a senior developer at PowerRide two months ago. She works alongside eight other team members. Similarly, Meredith has a background in informatics and has previously worked as a consultant, including at

DriveForce. She currently serves as a business analyst in a team of 20 members, a role she has held for a year.

Goals

Meredith explains that although several teams within the Business department share similar goals with her team, their collaboration is not as efficient as she desires due to the current organizational structure. She believes that relocating these teams to Digital would provide a more agile approach to handling and achieving results.

Relation to Business

Meredith explains that despite their team's open communication culture, there is a noticeable difference in mindset and culture when compared to their stakeholders in Business. She points out that they often struggle to understand each other as if they belong to different worlds. Erin agrees with Meredith and adds that the developers on the business side are not fully aware of their work. Regarding power dynamics, Meredith notes that the business stakeholder has the final decision-making power. When discussing the challenge of aligning priorities between Digital and Business, Meredith expresses a desire for a designated person to take on the responsibility of ensuring alignment.

Roles

While Erin experiences that the roles are clearly defined and have a non-rotational nature, she proposes that introducing some rotation could prove advantageous for the team. In terms of task distribution, Meredith explains that there is an open discussion about who should work on which task, but the digital lead ultimately makes the final decision. She also notes that their software team currently lacks designers, which she believes would be a valuable addition. Currently, the designers are part of their stakeholder's team, and Meredith sees this as a potential cause for the difficulties they face in aligning priorities and working together effectively.

Scale-up company

Meredith notes that despite the company's growth, it still maintains a sense of intimacy. She feels that top management is always accessible when it comes to understanding decisions, giving her a sense of proximity to decision-makers.

Transparency

Meredith praises the transparency of the management in the decision-making process. Erin shares Meredith's view, stating that she receives more comprehensive information here than she did during her time at DriveForce.

Legacy

Erin and Meredith both have prior work experience at DriveForce and agree that there is little influence of legacy from their past workplace in PowerRide, aside from the usage of some common systems. Meredith particularly feels that PowerRide's culture is more contemporary compared to DriveForce. She explains that DriveForce is more attached to their business model, which involves their dealerships, an aspect that PowerRide does not have. Erin and Meredith share the opinion that DriveForce is more internally divided, and that PowerRide is capable of responding to situations in a more timely manner. They also observe that PowerRide is making efforts to embrace the agile methodology. Regarding the presence of DriveForce alumni at PowerRide, Meredith explains that the company only hires individuals who fit well into their organizational culture, thereby preventing any undue influence from their previous employment at DriveForce. As a result, she emphasizes that PowerRide has not been transformed into DriveForce.

Documentation

Erin finds it frustrating as a new employee to have inadequate documentation on past work, despite the availability of internal channels for documentation. She notes that her team's documentation is outdated, unstructured, and difficult to navigate. Additionally, Erin struggles with understanding the purpose of certain tasks due to the lack of well-defined user stories. She observes that their user stories tend to focus on technical requirements, whereas Meredith works on specifying a more comprehensive set of requirements that include purpose. Erin suggests that whoever adds tasks to their backlog should be clear about their purpose, even if they are not entirely certain themselves. She shares that she has experienced instances where the task author did not understand the purpose and where team members dismissed the importance of knowing it. Erin wonders if this is a cultural issue within their team, as she has not encountered it elsewhere. In contrast, Meredith has not experienced a similar lack of purposeful understanding, possibly because she is involved in requirements specification. Erin mentions that their team shares a business analyst with another team and that they may be understaffed.

Communication

Half of the interviewees' teams consist of consultants who work remotely from abroad, while the other half are employees of PowerRide who work in Sweden. As a result, all team communication takes place digitally. When discussing the development of new features across teams, Erin and Meredith believe that it can be challenging to identify the appropriate individuals and understand whom to contact. Erin expressed a desire for clearer expectations from the business stakeholders.

Ways of working

Meredith explains that historically, they have employed a waterfall-driven approach but are currently transitioning towards agile development. Specifically, Meredith

would prefer that they utilize minimum viable products (MVPs) in their development process. At present, they deliver sizable components and evaluate their success retrospectively.

Priorities

Meredith acknowledges the difficulty of establishing priorities when working closely with stakeholders. She explains that the leadership function often fails to establish and align priorities, which can create confusion. Additionally, Meredith's team has its own set of technical priorities that need to be balanced with the priorities of the business stakeholders. She finds this task challenging, as it does not always lead to clear decision-making. Meredith emphasizes that her team's priority is to make technical improvements that enhance the website's user experience. However, the business stakeholders have different priorities that are difficult to align with the technical improvements needed. Meredith believes that more open discussions could help clarify these priorities, stating that alignment and clarity would ensure smooth teamwork. Erin believes that the leadership function could promote collaboration between teams and create a unified view of technical requirements and goals.

Sheltered by the digital lead

Erin explains that her team's digital lead is skilled at sheltering the team from external disruptions. The digital lead enables the team to focus on what they consider important, as a Scrum master would do. Erin clarifies that one of the business teams they collaborate with has a different mindset, which prioritizes constant problem-solving. Erin attributes this to the team's greater pressure and different culture and mindset compared to the team at Digital.

4.1.4 Group interview 4 - team members

Background

Andy and Phyllis are both senior software developers who work together in the same team. Phyllis has prior experience as a software developer at DriveForce, while Andy has no previous experience in the automotive industry. The team they work in is quite large, comprising ten members, including developers, testers, a business analyst, and a technical lead. On a higher level, they also have a digital lead and a manager who oversees several teams. The team has weekly meetings with the digital lead but has little to no contact with their manager.

Relation to Business

Andy and Phyllis explain that the business analyst acts as the intermediary between their team and the stakeholders, and is responsible for managing all the requirements. However, they face challenges with changing requirements that are not communicated effectively from the start or are vaguely defined. Sometimes the

implementation process starts before the requirements are finalized. Despite this, they are content with not having any direct contact with the stakeholders. They also mention that they sometimes understand the purpose of their tasks, and sometimes they do not, but they do not find it problematic to work on tasks without a clear understanding of the purpose. When asked if collaborating with Business would make the purpose clearer, Andy shares his previous experience of interacting with Business, indicating that sometimes, the stakeholders themselves are not sure of the purpose of their requests. Phyllis agrees, stating that collaboration would not necessarily clarify things. However, Andy believes that some level of interaction with the stakeholders could be beneficial, as it might motivate the team and provide insight into how the system is being used. He cites a previous experience where he had to interact with five or six different stakeholders, and the lack of communication between the teams caused fragmentation and inefficiencies. Additionally, Andy highlights that sometimes, Business requests something without providing a clear rationale, and the team is expected to implement it regardless.

Ways of working

Andy and Phyllis's team is currently not using a sprint-based approach, instead, they use Kanban due to their project's nature. However, most of the Digital teams prefer sprint-based work. Andy is not a fan of sprints based on his past experiences, where he found them to be less productive due to excessive meetings. In contrast, Phyllis likes working with sprints because they provide better planning opportunities.

Andy mentions that their team decides what to do based on people, not the board. In his opinion, the team lacks agile ways of working when dealing with projects that have a predefined end date. Additionally, he suggests that the team members should log every task that takes more than a set amount of time, which they currently do not do.

Phyllis has experience with the SAFe framework in a team at DriveForce, while Andy has used SAFe in another company. He found that SAFe was more of a way to teach management how to be agile and hide the waterfall approach that was still being used. He adds that sometimes, management has a plan for the next twelve months over which the budget spans, and there is no feedback loop to improve the process.

Sheltered by the technical lead

Andy and Phyllis describe that their technical lead protects the team from external disturbances by handling communication with other teams and management who require their time and work. According to Phyllis, the technical lead helps them determine which tasks to accept and work on, explaining that "if you are getting hundreds of requirements it has to come through him. Because if they directly come to us and start asking us to do things then it will be a complete mess." Andy fur-

ther states that they prioritize tasks at the top of the backlog, based on the business analyst's and technical lead's recommendations.

Team maturity

When discussing team maturity, Andy states that the team is fairly immature, with a lot of sub-groups formed. He further explains that they have not had any challenges where they need to solve bigger things together as a bigger group. Most of the things have been solved by working in pairs. According to Andy, the team is not working as a team but rather working on separate tasks. He describes that there is a small sub-team that has worked on a separate product. He also finds that remote work leads to only talking to some team members during meetings and some that they contact when needing something. The size of the team and distributed tasks have resulted in often talking with the same persons in the team when solving something, Andy points out.

Self-organizing

Andy thinks that their team is self-organizing. Phyllis adds that their team lead does not need to micromanage them, as they have experience in their roles and responsibilities, and know whom to contact if they have any issues. She also emphasizes that everyone in the team understands their tasks and works systematically. However, Andy acknowledges that this causes them to communicate less as a team since they are working on different parts of the tasks. Additionally, he notes that the team's visibility is limited due to the number of senior members, which would be different if the team had some less experienced developers.

4.1.5 Analysis

This section provides a summary and analysis of the findings obtained from the group interviews, establishing connections between the results and previous work. Perspectives on the initial themes presented in Table 4.2, were compiled and led to the identification of more specific themes. These new themes are presented as bolded headings in the subsequent analysis and form the foundation for the key aspects presented in the next section.

Lack of clear and shared goals

Multiple interviewees expressed their perspectives on goal setting, collaboration, and organizational structure. One leader observed that different departments have different objectives, resulting in misaligned endeavors, and recommended a shared comprehensive goal to promote alignment among them. This statement is supported by West et al. who argue that shared business-oriented goals ease the friction between the business and development side [27]. Several leaders perceived that the organization's objectives and visions lack clarity and specificity, and advocated for a unified vision and unambiguous definitions which aligns with West et al.'s rec-

ommendation to have shared goals [27]. The interviewees also discussed the need for epics to track contributions to broader objectives. One interviewee noted that relocating some teams at Business to Digital's division would enable a more agile approach to achieving outcomes, as there is presently inefficiency in collaboration between teams with comparable objectives in the Business department.

Complicated relation to Business

The interviewees generally perceived that there is a lack of understanding and alignment between Digital and Business. Three leaders expressed that Business fails to recognize the mandatory tasks that Digital must perform, such as maintenance and security work. This lack of comprehension regarding Digital's work and value generation is a significant issue. As raised in one interview, Digital's products serve as enablers, making it difficult to measure the impact of their work in terms of car sales. This situation aligns with the theory by Devaraj and Kohli, which emphasize that the effectiveness of IT investments depends on their proper utilization and acknowledging their value [69]. Reducing technical debt was in an interview mentioned as an example that may not directly increase sales. To assess the economic potential, Devaraj and Kohli argue that it is crucial to consider both financial indicators and non-financial criteria. In the case of Digital, focusing solely on car sales as a performance indicator may not capture the full value and impact of Digital's work. Agile leadership is challenged by the waterfall approach from Business, which frequently drives significant initiatives. One leader observed that the power dynamics favor Business stakeholders, who have the ultimate decision-making power. One business analyst reported acting as an intermediary between Digital and Business stakeholders but still faces challenges due to changing requirements and poorly defined tasks. Collaboration with Business may not necessarily resolve all the issues, but some level of increased interaction with the stakeholders could provide valuable insight into how the performed tasks are being used and avoid fragmentation and inefficiencies. Similarly, Luftman suggests that IT departments should be closely correlated and collaborate with business departments in order to improve overall outcomes. [68].

Inconsistent and confusing roles

The interviewees raised concerns regarding role clarity and accountability within the organization. It was noted that some team members are unclear about the roles' boundaries and limitations, which may lead to confusion and inefficiency. Additionally, the number of individuals with the title of "lead" was discussed, and some interviewees expressed concern that this could impede team autonomy and self-organization. To address these issues, there was a desire for clear accountability among team members and some interviewees suggested that discussing roles more thoroughly could be beneficial for the teams. These suggestions are in line with Spiegler et al.'s conclusion that a lack of alignment regarding responsibilities can lead to uncertainty about roles and responsibilities [16].

Scale-up company

The interviewees discussed that PowerRide has grown from a start-up to a scale-up company, and continues to grow. According to two leaders, the company stands out from others in the industry due to its unique strategy of selling cars directly to customers. However, one team member expressed concern about the rapid expansion of the company, which may be leading to a lack of clear goals. Dyba and Dingsoyr also observe that implementing agile methods and aligning goals in larger contexts is more challenging than in smaller contexts [54]. To tackle this issue, Dikert et al. propose extensive collaboration between departments [55]. Although the company is in a growth phase, the interviewees agreed that PowerRide still maintains a sense of intimacy, and top management is readily available to employees when it comes to understanding decisions.

Varied perception of transparency

The interviewees held divergent views on the level of transparency at PowerRide. Two leaders expressed concerns regarding the lack of transparency in the organization, as they were unable to find records of past decisions or meetings. They advocated for greater transparency, which would allow everyone to participate in any meeting. Moe et al. argue that transparency is necessary to avoid power imbalances [19]. In contrast to the concerns expressed by the leaders, two team members praised the management's transparency in decision-making.

Task- or problem-based

Two leaders noted that the workflow at the organization was task-based rather than problem-based. They argued that this approach does not promote a problem-solving mentality among team members. Instead, they suggested that teams should focus on addressing and resolving problems rather than completing predefined tasks. The leaders suggested that providing teams with problems to solve can help clarify their purpose and increase motivation, resulting in a more effective and efficient workflow. This notion is in line with West et al. [27], who propose that agile development requires team members to work towards solving problems. However, Highsmith [18] argues that agile teams should organize around tasks. It is worth noting that the interviewees' suggestion to work with problems instead of tasks is primarily about taking ownership, and not because they are averse to working with tasks.

Legacy from DriveForce

There are varying viewpoints among the interviewees regarding the extent to which PowerRide has been influenced by its predecessor, DriveForce. Some leaders noted that PowerRide has inherited several tools, support systems, communication practices, and car plans from DriveForce. Some leaders also expressed concerns that the company's leaders might fall back into old habits from DriveForce, impeding innovation at PowerRide. In contrast, team members stated that PowerRide's culture

has little influence from DriveForce, and the company has a contemporary culture that allows for timely responses to situations. Additionally, they mentioned that PowerRide adopts agile methodologies in a different way than DriveForce and carefully selects individuals who fit well into the company's culture, thus preventing any negative influences from DriveForce.

Documentation of tasks and past decisions

One team member expressed frustration with the inadequate documentation of previous work at the company, resulting in navigation difficulties. Moreover, she noted that user stories tend to concentrate more on technical requirements than on the purpose, leading to difficulties in comprehending the significance of certain tasks. Another team member proposed addressing this issue by adding clarity on the purpose of tasks to the backlog. Hoda and Murugesan recommend knowledge exchange in order to better understand the purpose of what is being done [50]. However, a different team member, involved in requirements specification, held the belief that user stories are sufficiently comprehensive and well-defined, with satisfactory documentation.

Remote work and communication

During the interviews, the composition of the teams arose as a topic of discussion. The teams are comprised of both consultants who work remotely from abroad and PowerRide employees based in Sweden, which means that all communication takes place digitally. Two team members expressed that the remote work setup can sometimes pose challenges in identifying the right individuals to contact when developing new features across teams. According to Zhang et al., remote work may have an adverse impact on the performance of immature teams [39]. Given the low maturity levels typically exhibited by teams within this department, it may be wise to consider reducing the extent of remote work as a means of improving team outcomes.

No common ways of working

The interviewees shared similar perspectives on the importance of agile development values, with two leaders acknowledging that the department needs to prioritize people over processes to avoid hindering workflow and objectives, which aligns with the agile manifesto [18]. Meanwhile, a business analyst mentioned that they are transitioning towards agile development and would like to incorporate minimum viable products (MVPs) into their development process. Depending on their project's nature, some teams use Kanban. However, two team members had contrasting opinions on sprints, with one finding them unproductive due to excessive meetings, while the other appreciated the planning opportunities provided by sprints.

Priority conflicts

Some team members discussed the challenges of establishing priorities in their work,

highlighting the difficulty of balancing technical priorities with those of their stakeholders in Business. They noted that the lack of clarity and alignment between technical improvements and Business's priorities can confuse, and suggested that more open discussions could help address this issue. This suggestion is also presented in Spiegler et al.'s study where they describe that a lack of alignment and communication can lead to ambiguity and lack of motivation [16]. The role of the leadership function was emphasized by the interviewees in promoting collaboration between teams and creating a unified view of technical requirements and goals. Overall, the team members emphasized the importance of clear communication and alignment between technical and business priorities for effective project planning and execution. These opinions are correlated to West et al.'s recommendation of finding shared business-oriented priorities to ease the friction between the business and development side and balance quality and functionality in software projects [27].

Sheltered by leader

Some team members shared their experiences of being shielded from external disruptions and distractions by their respective team leaders. They pointed out that the digital lead or technical lead has protected their teams from external disturbances and enabled them to focus on their priorities. According to them, the team leaders manage all communication with other teams and management, ensuring that only the business analyst and technical lead are in contact with stakeholders. These team members emphasized the significance of shielding the team from external disruptions, and they consider the team leaders to be instrumental in maintaining this focus and boosting productivity. Several authors emphasize the importance of agile leaders protecting their teams from external disturbances [40, 63, 2]. In addition, Schwaber & Beedle also support the interviewees' preferences as their study shows that agile leaders should shield teams from unrealistic customer demands to ensure efficiency [2].

Team maturity challenges

Two team members expressed that team maturity is a challenge, noting that the team is not working collaboratively but rather on separate tasks in sub-teams, and that remote work has affected natural and collaborative communication within the team. This assertion is consistent with the argument posited by Zhang et al. in their study, where it is claimed that remote work in an immature team can lead to unfavorable outcomes [39]. Such negative effects may manifest in the form of decreased team member satisfaction, and consequently, suboptimal team performance.

Self-organizing experienced teams

Some team members expressed that teams composed of experienced team members are often self-organizing, reducing the need for the team lead to manage them to the same extent as they would if the team had less experience. They have a systematic way of working and know who to contact if any issues arise. However, the

interviewees stressed that this can lead to less communication among team members since they are working on different aspects of the task. This experience is described by Highsmith who claims that self-organizing teams have the tendency to work internally and separately taking own responsibility in organizing around tasks [18].

4.1.6 Key aspects

The following bullet points summarize the key aspects that emerged from the group interviews. Subsequently, these aspects were categorized into themes that form the foundation for the individual interviews in the second round of interviews. These themes are presented in Figure 4.1.

Organizational issues

- Unclear goals
- Lack of shared goals
- Scale-up company
- Lacking team maturity

Communication & collaboration

- Complicated relation to Business
- No common ways of working
- Challenges with prioritization
- Lacking transparency
- Lacking communication caused by remote work

Process & documentation

- Inconsistent and confusing roles
- Problem with task-based workflows
- Insufficient documentation

Team structure

- Close to self-organized teams

Legacy

- Positive and negative views on the legacy from DriveForce

Leadership

- Sheltering from outside disturbances

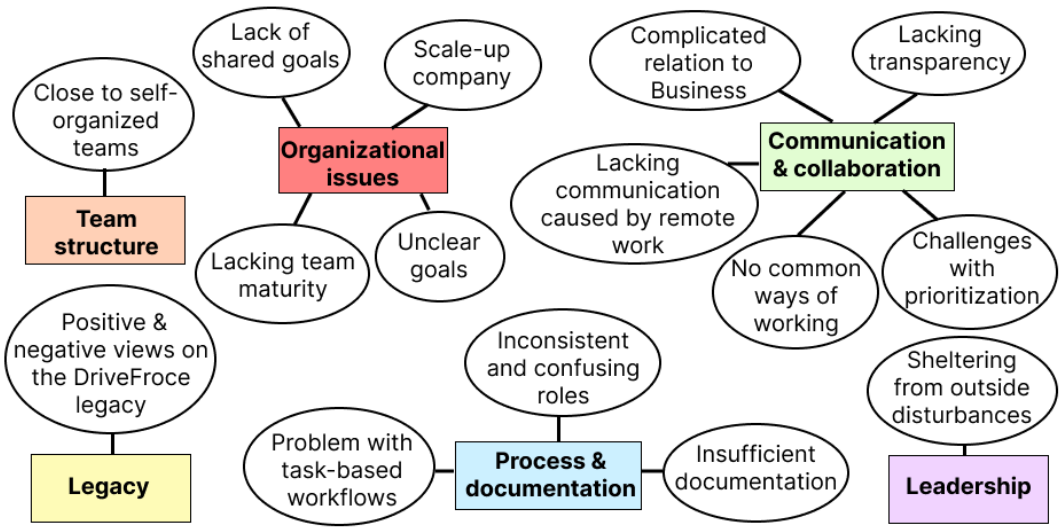

Figure 4.1: Key aspects grouped in themes on which to develop questions for the individual interviews.

4.2 Individual interviews

Table 4.3 provides a summary of the themes that emerged during the second round of interviews, where individual interviews were conducted. The table offers an overview of the key topics discussed by both the leaders and team members (TMs) during the interviews as well as their general perspectives. Similar to the group interviews, not all themes are included in the results for all interviews, as some individuals did not provide any significant insights or thoughts on certain topics, resulting in a lack of relevant information.

Themes	Negative leaders	Positive leaders	Negative TMs	Positive TMs
Goals	2	0	2	0
Relation to Business	1	0	0	1
Roles	1	0	1	1
Transparency	0	0	0	1
Legacy	1	0	0	1
Ways of working	1	0	0	2
Synchronized teams	2	0	2	0
Scaled agile	1	0	0	1
Teamwork	1	1	1	1
Leadership	0	0	1	0
Priorities	1	0	1	0

Table 4.3: Summarized themes that were brought up in the second interview round and the number of employees expressing negative and positive views of the current state of the themes.

4.2.1 Individual interview 1 - leader

Background

Stanley, a technical lead, heads a supporting software team that caters to the entire PowerRide organization, following the Kanban methodology. He has a background in systems science and has worked as a consultant in various roles for over ten years before joining PowerRide.

Goals

Stanley observes that Digital lacks KPIs, a clear vision, and mission. Although the DPM (Digital Product Manager) and he work on crafting visions and missions for the teams within their area, he feels that there is a missing link to PowerRide and Digital. In his opinion, without a clear vision and mission, it is impossible to determine whether agile is the best approach for their organization.

Relation to Business

Stanley highlights that at Digital, other teams often receive a large influx of requirements and feature requests from the Business side, leading to a perception that they are more of a ”feature factory” than an organization that takes ownership of a product and its responsibilities. In Stanley’s opinion, it is crucial to foster a positive

collaboration with Business and to grasp their true needs, rather than simply relying on surface-level descriptions of what they want. Without a clear understanding of Business's mission, vision, and needs, it becomes challenging for Digital to take true ownership of the solutions they develop.

Roles

Stanley expresses concern about the confusion surrounding PowerRide's roles, which are purportedly linked to Scrum roles but are referred to differently and interpreted variably by different individuals. In particular, Stanley notes that it is unclear who holds the product owner role and observes that the Scrum master role is absent. He believes that if PowerRide would transition fully to agile methodologies, the organization would require numerous agile coaches, as its agile maturity is currently low.

Legacy

Stanley notes that many of the employees at PowerRide have worked at DriveForce in the past, and as a result, they bring knowledge and experience to the table. However, he also observes that there are some key differences between the two organizations. According to Stanley, PowerRide places a greater emphasis on developing improved software architecture. While there may be similarities between the two companies, PowerRide is committed to forging its own path forward.

Ways of working

Stanley describes that the problem is that PowerRide needs to be clearer on its way of working, which he connects to the organization's failure to live up to its identity as a product organization. Stanley views PowerRide as a mixture of a project, initiative, and product organization. He thinks that one contributing factor is that they have many project managers instead of product owners. Stanley brings up that they have many strict deadlines related to the launch of cars but believes that it would still be possible to work agile.

Synchronized teams

Stanley describes that all teams have the freedom to choose whether to work with Scrum or Kanban, without having a shared cadence throughout the organization. He believes this hinders shared planning and collaboration between teams. Stanley also notes that the cycle times tend to be long. Many Digital teams have many dependencies, making it challenging to collaborate with other teams without synchronized sprint schedules. He states that they struggle with processes such as requirement intake, dependency management, and planning. This is due to the lack of a clear structure for the way of working and processes.

Teamwork

Stanley notes that there are many handovers between teams instead of working together as one team towards a common goal, which contradicts the notion of being a product organization. He also observes that there are project managers in the organization, which could be a sign of limited agile maturity.

Priorities

Stanley finds it challenging to manage priorities within his team. When asked to elaborate, he explains that 80% of the work they receive is unplanned, and it can sometimes appear that the loudest voices get their needs met first. This creates confusion as the team follows queues, and Stanley, as their leader, struggles to prioritize them. He emphasizes the need for clearer guidelines on prioritization to avoid disrupting the workflow.

4.2.2 Individual interview 2 - team member

Background

Kelly is a software developer in a team consisting of approximately ten members that adhere to Scrum methodology. She previously served as a Scrum master in a SAFe environment. Kelly has a background in systems science and economics and had no prior involvement in the automotive industry before joining PowerRide less than a year ago.

Goals

When discussing goal clarity, Kelly highlights the need for improvement within her team. While they have estimations of what they can achieve in each sprint, they fail to set clear goals to commit to finishing. This lack of commitment disappoints Kelly, and she notes that their current goals are unclear from an agile perspective. She attributes this to PowerRide's fear of providing a clear structure and goals, likely influenced by their past experiences with SAFe at DriveForce. As an agile practitioner, Kelly advocates for clear goals and structure to improve planning and synchronization, particularly for teams with many dependencies. To achieve this, she suggests communicating goals at a team level, rather than at a broad organizational level that may be difficult to apply concretely.

Relation to Business

Kelly believes that her team needs a broader perspective of the scope to understand why they are working on specific features and requests. Currently, they feel too isolated from the end-user, hindering their ability to comprehend the purpose of their work. To gain context, Kelly suggests either direct contact with the user or access to the full system. Although Kelly's team does not depend on other teams, she still feels that collaboration between teams is hindered by too many intermediaries. Typically, when a requirement comes from the end users or markets, it first reaches

the sales lead, then the digital lead who is the product owner, who communicates with the business analyst and technical lead, who then relay the requirement to the team. Once the technical lead makes a decision, it is communicated back to the Business side through the product owner. Kelly believes that these communication chains can negatively impact their work. By the time a request lands on the developers' desk, stakeholders have often been waiting for months. This leads to situations where the original request may no longer be relevant or the work process becomes highly stressful.

Roles

Kelly explains that her team follows Scrum methodology and has a dedicated Scrum master and product owner with well-defined responsibilities. She also observes that the team is proficient in sharing and assuming responsibilities. However, due to the growth of the organization, Kelly feels that certain roles are missing. As a consequence, the team members are increasingly accountable for their own work and could benefit from more explicit guidelines to facilitate their responsibilities.

Transparency

Kelly believes that PowerRide fosters a culture of transparency, where information is shared openly within the organization, while still maintaining necessary security protocols. She finds that the company has a young and tight-knit feel, which she hopes will persist as the company grows.

Legacy

Kelly describes not seeing any legacy from DriveForce that negatively affects their work.

Ways of working

Kelly describes that her team has an agile ceremony called "three amigos". During this ceremony, a developer, someone from Business, and a UX designer or tester meet to look at the requirements, build the user story, and clarify it. The main purpose of this ceremony is to have people from different backgrounds build the stories from different perspectives. Kelly also mentions that this ceremony helps the team see the dependencies between the stories and facilitates collaboration within the team and with Business.

Kelly believes that PowerRide gains a lot by not following in the footsteps of DriveForce in implementing the SAFe framework. She notes that DriveForce implemented the SAFe methodology within the full organization and forced it upon their employees, which resulted in dissatisfaction. She believes that SAFe and agile methodologies are well-suited for IT implementation but may not be the best fit for PowerRide as it is not an IT company.

Kelly acknowledges that as a growing company, PowerRide may not have stable teams, which makes it difficult to implement a SAFe methodology fully within the organization. However, she still wants to have clearer guidelines and implement at least some scaled agile to improve collaboration between teams.

Synchronized teams

Kelly would like to have synchronized sprint schedules between teams, to allow for easier planning and collaboration with the dependent teams.

Teamwork

Kelly characterizes her team as tightly knit and notes that they generally work from the office, facilitating excellent collaboration and communication. Familiarity with each other and frequent interactions further augment the quality of their work. Kelly identifies the willingness to ascribe responsibility to the team rather than individuals as a key factor in fostering teamwork.

Leadership

Kelly advocates for agile leadership that is not tied to individual roles, and which could even be implemented at the top level rather than just at the project level. Shared knowledge and leadership, she suggests, are fostered by providing feedback, even when a particular implementation is deemed successful. This feedback can lead to alternative approaches that may be more efficient or increase quality. Currently, Kelly notes that there is no dedicated time set aside for providing such feedback, which she would like to see changed. Additionally, Kelly observes that leadership is struggling to keep pace with the speed of growth in terms of new hires, and sometimes managers fail to follow up with employees and their goals due to being occupied with new hires.

4.2.3 Individual interview 3 - team member

Background

Darryl is employed as a business analyst at Digital and has been with the company for over a year. He holds a master's degree in industrial engineering and management and has previously worked in similar positions before joining PowerRide.

Goals

Darryl mentions that he occasionally feels the team lacks direction. During a discussion on how to improve this, he suggests that PowerRide could enhance its goal-setting process. Specifically, Darryl believes that goals should be determined top-down, with clear priorities set to avoid prolonged discussions on which projects are

most critical.

Relation to Business

Darryl comments that, apart from occasional ambiguity from Business, they excel in communicating the reasoning behind tasks assigned to his team. As a business analyst, his role includes clarifying the purpose of the work, allowing him to understand the rationale behind his job almost always. When he encounters any uncertainties, he proactively seeks clarification. Although Darryl receives more detailed information than the developers, he acts as a gatekeeper, ensuring his team does not waste time on extraneous tasks. Furthermore, Darryl states that his team receives requirements from Business, but they are also encouraged to make suggestions and participate in maintenance and development.

Roles

Darryl suggests that the role responsibilities at Digital are not well-defined and that individuals tend to take ownership of tasks based on their interests rather than explicit job requirements. While he acknowledges that this approach has generally been effective given the high level of personal responsibility exhibited by employees, Darryl believes that the company would benefit from greater clarity and structure in this area.

Ways of working

Darryl believes that his team at Digital effectively follows the Scrum framework and that the company as a whole operates with an agile mindset. He explains that his team previously worked with sprints lasting two weeks, but they recently made the shift to three-week sprints. This change significantly improved their work and deliverables. This approach works well due to the modern technology stack and working with micro-services. Darryl recognizes the benefits of being agile, such as speed and flexibility for adapting to changes. However, he also acknowledges the challenge of keeping track of everything as things evolve quickly. Despite not having a dedicated Scrum master, Darryl explains that his team shares the responsibility among three other team members. The only issue he sees is a lack of clarity on how to prioritize work between multiple teams. Nevertheless, Darryl appreciates the freedom to adapt and change structures and processes within his team. He also reports that the team collaborates well together.

Synchronized teams

Darryl describes that there can be a lack of clarity in terms of responsibilities between different teams, which leads to an inefficient process of passing problems between teams. Although Darryl states that the team eventually solves the problems, it takes a lot of time due to the long chain of passing the issue between teams. Furthermore, there is no clear prioritization between teams and a fragmented team

landscape, which makes it difficult to manage dependencies. Darryl also mentions that his team is unsure about the level of the mandate they have for putting requirements on other teams. To address this issue, Darryl suggests a regular forum to discuss these issues rather than discussing them in the corridors.

Leadership

Darryl describes the leadership within his team as great and he likes his manager. However, he feels that management overall is somewhat absent, and it is challenging to see what they do. Darryl has not spoken to the management since he was in the recruitment process, but he is not worried about it. He thinks it would be nice to have more communication with them, but at the same time, he states: "I understand they have more important things to do than just talk to all the employees."

4.2.4 Individual interview 4 - leader

Background

Kevin, who has a background in management consulting and a track record of working primarily on business projects, currently holds the digital lead position. Kevin studied industrial engineering and has no prior experience in the field of information technology.

Goals

Kevin highlights a lack of clarity regarding the goals they are working toward. He explains that although there have been discussions about defining key performance indicators and metrics, no clear decisions have been made on what they should be or how to measure them. Furthermore, he notes that teams have to actively search for their goals rather than receiving them directly. While there are high-level goals, Kevin finds it unclear how they translate into actionable steps for the teams and how the teams can contribute to them. He points out that the Digital goals are not aligned with the business objectives and that addressing this uncertainty requires leadership guidance. Kevin suggests that collaboration from the outset could improve goal setting and alignment.

Relation to Business

Kevin describes that although they have weekly alignment meetings with business stakeholders, he has experienced situations where Business treats his team as IT support and requests tasks without providing the bigger picture or reasons for the request. He believes that it is important for him to communicate the role of his team and have discussions with business stakeholders to ensure that they work collaboratively. He prefers a proactive approach to their collaboration rather than reactive, where his team is not just reacting to requests from Business but is also helping them understand how they can utilize digital capabilities in a better way. He men-

tions that some members of his team have expressed frustration when they receive tasks without proper explanations from Business.

When asked about how Digital and Business should collaborate, Kevin suggests that they should adapt their way of working to the type of tasks, activities, and products they are working on. He believes that having a common framework for certain tasks and features could help ensure that they have the same view on how to approach them. He mentions that one challenge they have faced is getting their stakeholders in Business to understand the criticality and importance of some features and to prioritize them in their backlog. To address this, his team has introduced weekly alignment meetings to ensure they receive feedback from stakeholders in Business and can discuss their work.

Roles

Kevin mentions that a roadmap lead has recently been appointed at the domain level, which he considers being a crucial role for their team. He believes that the lack of this role was the reason for their governance-related challenges in the past. Kevin also points out that there is some uncertainty regarding the differences between the technical lead, digital lead, and DPM roles. He feels that unclear roles and responsibilities can be better addressed through extensive discussions instead of solely relying on general role descriptions. While acknowledging the importance of having clear role descriptions, Kevin feels that discussions on how to apply them in different situations can help clarify who is responsible for what and what is expected of each team member.

Transparency

Kevin states that the organization is quite transparent at low levels, such as within and among the teams. However, from a certain level and up, transparency decreases significantly, and he thinks this is a challenge. When discussing management, he states that it seems like they have not found the right tools or ways to ensure transparency. He also adds that he believes it is difficult to maintain complete transparency when working at a high speed. He also highlights the fact that they want to empower teams to be self-driven, and not disrupt them. High levels of transparency create high levels of communication, which Kevin describes as time-consuming for people.

Legacy

Kevin has observed that the integration of DriveForce data into their systems has resulted in some negative effects. He elaborates that this has led to a situation where they are bound to licenses for software that are connected to DriveForce.

Ways of working

Kevin acknowledges the superior agile skills of his team members and endeavors to maintain an open and receptive attitude towards their input, allowing them to work as they see fit, provided that they deliver satisfactory outcomes and maintain customer satisfaction. While the team has established basic Scrum practices, Kevin confesses that there was a time when they discontinued retrospective meetings, which he now realizes are invaluable.

Regarding the distinction between developing enabling software and the main product, Kevin speculates that the latter involves greater clarity, guidelines, and structured procedures within the teams. He also believes that they would benefit from more robust frameworks and structures. While they must tailor their approach to each team's specific tasks and products, even the flexibility to select their preferred methodology would be helpful. According to Kevin, the Digital department operates too remotely from the company's established structures. Nevertheless, he acknowledges that it would be challenging for the organization to embrace complete agile practices due to their rigid car-launch schedules, which can complicate agile operations.

Synchronized teams

Kevin describes that the absence of a standardized approach to work among different teams poses a challenge when collaborating with other product teams. He believes that having a common approach would help clarify the process for taking on tasks during the scoping phase of a new feature. With greater understanding, collaboration could improve.

Teamwork

Kevin believes that his team has good teamwork, but he also acknowledges the challenge of finding a balance when there is a lot of work to be done. Although working together is more enjoyable, being efficient requires them to divide the tasks. To achieve this, Kevin emphasizes the importance of clarifying who is in charge of what initiative within the team. By doing so, team members can take responsibility and collaborate with others to ensure that no one is working in isolation.

Priorities

Kevin notes that different teams have varying approaches to prioritization and decision-making, with some using a top-level approach to determine the most important initiatives, while others have road maps. However, he highlights the challenge of prioritizing tasks that are dependent on multiple teams' work, and currently, they ensure that other teams prioritize the tasks related to the initiative in their backlogs. Kevin thinks that having a clear approach to handling these situations would help resolve the challenges related to prioritization.

4.2.5 Analysis

This section provides a summary and analysis of the findings obtained from the individual interviews, establishing connections between the results and previous work. The perspectives on the initial themes presented in Table 4.3, were compiled and led to the identification of more specific themes. These new themes are presented as bolded headings in the subsequent analysis and form the foundation for the guidelines.

Lack of clear and shared goals

All of the interviewed leaders and team members expressed concerns about the current state of PowerRide's goals. They wish for a clearer formulation of and connection between goals for Digital, PowerRide, and individual teams. One interviewee specifically called for a top-down decision-making process for goals and several wanted the goals to be broken down into team-level objectives. This relates to Tripp and Armstrong's discussion of goal alignments and the risk that different teams' and team members' objectives may not align with the organization's goals, leading to a lack of compatibility [48]. Clear goals would improve awareness of the direction and foster better teamwork, as well-functioning teams organize around shared goals, as previously found by Wageman [45].

Complicated relation to Business

Clear and shared goals could also contribute by improving the relationship with the Business. If both parts of the company understand how their work contributes to a shared, overarching goal, it would increase understanding and improve collaboration, in parity with Wageman's findings of shared goals [45]. One leader pointed out that Digital's teams receive many requirements and feature requests from Business that describe what they want rather than what they need, hindering Digital's teams to work problem-based and take ownership of the solution as you should when working agile, as described by West et al. [27]. The second leader, as well as one team member, described similar situations of receiving tasks from Business without any explanation of why. The team member who works as a business analyst did not share this view, which is expected since their role focuses on eliciting and handling requirements. However, the question remains as to where a link is missing in the chain.

Inconsistent and confusing roles

The role description of the digital lead is similar to that of the Scrum product owner, while the technical lead is defined similarly to the Scrum master when comparing with Schwaber and Beedle's definitions [28]. However, these roles defined by PowerRide seem confusing since they have different names than the Scrum roles and are interpreted differently by different individuals. In some of the interviewees' teams, the digital lead works as the product owner and the technical lead as the Scrum master. However, in one case, the Scrum master was a third person, and

in another case, the Scrum master was described as missing. In one instance, the digital lead was also described as having the Scrum master role. One positive aspect of these differences in role practices is that they allow for flexibility to adapt to what works best for a specific team, in accordance with the self-organizing concept [41, 42, 18, 2]. However, it is challenging to ensure that the roles and responsibilities are fulfilled when not knowing who takes which part of the role in practice. Hoda et al. found informal roles in well-functioning, self-organizing, agile teams [20], but for a relatively immature team with certain issues, these roles may need to be actively fulfilled rather than happening naturally. The teams may become frustrated due to conflicting expectations of the agile way of working, as a consequence of no common understanding or clearly communicated expectations within the organization, as argued by Spiegler et al. [16], which calls for organizational guidance and structure. Another potential downside of inconsistent roles is when collaborating with other teams and not knowing whom to turn to for a specific issue. This can also lead to confusion when moving team members to new teams, where they must adapt to a new practice of these roles. Assuming that management believes that the roles are practiced as they are described, there can also be issues related to sharing information and scheduling meetings with leads who may, in fact, act in a different role within their team. Some of the interviewees would like these roles to change to commonly known ones, i.e., product owner and Scrum master, to ease the confusion. They mean that the Scrum roles would not be as easy to misinterpret. Another possible root cause could be insufficient explanation and training of the roles, which are some of the factors Moe et al. argued hinder shared decision-making [19]. PowerRide could overcome these challenges by following Moe et al.'s best practices, which are to promote open communication and transparency, encourage continuous learning and improvement, and set clear goals and objectives.

Varied perceptions of transparency

In the first round of interviews, transparency was highlighted as an issue. However, in the second round, interviewees expressed a more favorable attitude toward the level of transparency within PowerRide. A team member considered PowerRide to be highly transparent while adhering to necessary security protocols, whereas a leader noted that transparency tends to decrease at higher levels of the organizational hierarchy. Open communication and transparency could also help overcome challenges of shared decision-making and improve the communication and trust between team members, which helps teams to succeed with self-organizing, as Moe et al. found in their study on challenges of shared decision-making [19].

Legacy from DriveForce

Only one leader expressed a negative impact on their work due to the legacy from DriveForce, while one team member saw a more positive influence from DriveForce's legacy. The amount of cultural legacy is difficult to determine, as it can be latent and all individuals bring more or less from their previous employers, which is described in a merger and acquisition context by Duvall-Dickson [67]. It is however

challenging to trace where specific attributes come from, as they can be inherited from DriveForce, some other previous employer, or from somewhere else where the employee adopted habits and culture. What is found is however that there are some common systems and data dependencies, but that the cultural part is differently interpreted between employees.

Mixed organizational structure

Several interviewees have emphasized the need for PowerRide to establish clearer operational procedures. According to one leader, the organization operates as a blend of a project, initiative, and product structure, despite identifying as a product organization. Having project managers can be interpreted as a concrete example of PowerRide's deviation from a product organization. Additionally, multiple interviewees noted that PowerRide works toward many rigorous launch-related deadlines, which could conflict with agile methodologies that prioritize flexibility and evolving requirements over adhering to a plan, as defined by Highsmith [18]. Nonetheless, agile methodologies could be adapted to prioritize strict deadlines while prioritizing the product, thus enabling PowerRide to function more effectively as a product organization.

Unsynchronized teams

A lack of synchronization among teams presents significant challenges for effective collaboration. As many teams depend on and have dependencies from others, having a well-functioning collaboration is crucial. However, agile methodologies such as Scrum were developed for single-product development by one team without internal stakeholders, competing products to prioritize, or other teams to collaborate with due to dependencies, extended from findings of Boehm and Turner [53] and Dybåå and Dingsøyr [54]. Therefore, additional elements and adjustments are necessary in larger organizations, such as PowerRide, that experience these aspects.

Scaled agile

Scaled agile frameworks have been developed and implemented in other organizations, with the SAFe implementation at DriveForce being one example. While some interviewees see potential in adopting the SAFe framework due to more structured collaboration between teams, others have had bad experiences with too much time spent in meetings when working at DriveForce, leading to widespread dissatisfaction with this transformation. One leader mentioned that the new framework was imposed on employees rather than involving them in the transformation process and explaining how they would benefit from it. Furthermore, the leader suggested that DriveForce would need to bring in external agile coaches to achieve a full agile transformation due to the low level of agile maturity in the organization. However, it is unclear if a strictly agile framework is the best option for PowerRide, which is supported by Gemino et al.'s findings of hybrid project management approaches as both common and successful [59].

Teamwork success stories

Some interviewees described the teamwork within their teams as excellent. One common factor among these teams is that they often work from the office, which we speculate fosters closer relationships, higher team spirit, and efficient collaboration.

Teamwork struggles

As found in the interviews, hybrid teams that include members working remotely or abroad tend to struggle more with spontaneous communication and collaboration. Some interviewees shared experiences of their team not functioning as a cohesive unit, but rather as a group where every member works independently. It is not clear whether physical proximity is the main reason for this observation since it could also be a cultural or personal difference. For instance, those working from abroad might prefer to work independently, while collaborative individuals tend to enjoy coming into the office more often. However, investigating further could be worthwhile to enhance teamwork across all teams.

Leadership and management

The interviewees expressed satisfaction with the leadership within their teams. However, for management on a higher level, some noted that they are relatively invisible, making it challenging to understand their responsibilities. A solution to this issue could be to establish and communicate a clear vision and goals, in parity with Tripp and Armstrong's suggestions for adapting agile methodologies [48]. Additionally, sharing more of the management's agenda during the existing town hall meetings may help increase visibility and transparency.

Priority conflicts

Difficulties with prioritizing and decision-making between different initiatives and products are found to occur when teams collaborate. If teams were more synchronized, it would be easier to plan. Clear structures and action plans for how to prioritize conflicting tasks, how much to ask other teams to do for your initiatives, and how much your team is expected to prioritize helping other teams with their requests could also be helpful. There are road maps in place, road map leads, and the digital lead owns the road map for their team. However, there seems to be a coordination function lacking for prioritizing the road maps between different teams. It is not lacking for all teams but seems to hinder some.

4.2.6 Summary of findings

This section presents a summary and analysis of the findings derived from both rounds of interviews, explaining their connection to the theory of agile leadership. The summary and analysis serve as a foundational basis for proposing guidelines.

Way of working

We found that PowerRide does lacks a specified framework for the way of working. Consequently, leaders and team members experience confusion regarding how they are expected to organize and the available options for utilizing tools and processes. Additionally, the level of agility the organization aspires to achieve remains unclear. The individual teams can choose whatever agile framework they want to follow, if any at all. Dikert et al. found that large-scale adoption of agile poses challenges, and raised the need for inter-team coordination [55]. They identified difficulties in collaborating with non-software organizational functions, which can lead to a disconnect between development teams and stakeholders—an issue observed within the PowerRide organization.

Some teams have arranged three amigos meetings, a practice they have found successful in gathering diverse perspectives. Wang et al. share this positive view, by raising that the three amigos ceremony can build a shared understanding between the three perspectives of business, development, and testing [52]. Although retrospectives are conducted regularly by some teams, others do not engage in this practice. Retrospectives serve as a valuable platform for reflection and feedback, which relates to Moe et al.'s best practices for overcoming challenges of shared decision-making, where providing regular opportunities for reflection and feedback is included [19].

The projects at PowerRide are often large and Digital rarely receives any feedback from the end-user. This misalignment with the principles of agile approaches becomes evident, as one of the fundamental values of agile methods emphasizes "Customer collaboration over contract negotiation", as outlined in the Agile Manifesto [26]. Communication and collaboration with Digital's stakeholders at Business encounter challenges, particularly concerning changing requirements and lacking descriptions of the project's purpose.

We discovered that teams characterized as well-functioning and cohesive had the habit of often working together from the office in common. This advocates for working more at the office and less remotely, which aligns with Hidalgo's finding of that a lack of face-to-face meetings hinders self-organization [49]. Furthermore, the majority of teams at PowerRide Digital appear to be immature. Zhang et al. found that delegating tasks and responsibilities in an immature virtual team can lead to decreased satisfaction among team members and result in worse team performance [39]. This implies that leaders of remote teams should exercise caution in delegating responsibilities, taking into consideration the team's maturity level.

Another finding was the lack of synchronization among teams, which causes problems when having dependencies on other teams and project planning is required. When one team relies on deliverables from another team to commence their development, obtaining the necessary deliverables becomes problematic if the other team

has already concluded the planning phase of their sprint. Consequently, the dependent team's project remains on hold until the other team completes their sprint. This aligns with Dikert et al.'s findings on the need for inter-team coordination [55]. By adopting a shared sprint schedule, synchronized deliveries can be achieved when all teams are in the planning phase, facilitating resource allocation to fulfill other teams' requirements.

Organization structure

We discovered some issues with the organizational structure, such as too many leaders and a low amount of developers relative to the number of leaders. The consequences of such cases are mentioned in Lambert's study on having too many leaders in a company [66], including an increased bureaucratic burden and reduced profit distribution per employee. Spiegler et al. recommend critically examining the existing structure and processes within an organization before implementing agile processes [16].

PowerRide has implemented its own organization-specific role titles which have led to varying interpretations and confusion regarding responsibilities. Moreover, this can cause confusion when team members are relocated to new teams, requiring them to adjust to different role practices. Spiegler et al. suggest that employees need to openly discuss roles and responsibilities and agree on specified owners for some tasks and shared ownership of others [16]. An opposing argument to clearly defined roles is also found in the literature, where an advantage of these variances in role practices is the flexibility to tailor the roles to the specific needs of a team, in line with the principles of self-organization [41, 42, 18, 2]. However, teams can experience frustration when confronted with conflicting expectations regarding agile work practices, resulting from a lack of shared understanding or clearly communicated expectations within the organization, as pointed out by Spiegler et al. [16]. This underscores the need for organizational guidance and structure.

The employees at Digital feel that there are too long communication chains in certain situations and connect this to uncertainty of who has the final say in the decision-making. Moe et al. establish a connection between communication and decision-making, arguing that poor communication is the main obstacle that can prevent shared decision-making and self-organizing [40, 19]. Spiegler et al. suggest that an agreement between management and the team on decision-making responsibilities can create a shared understanding of leadership within the agile team [16].

Some teams' technical leads have taken on the responsibility to shelter the teams from outside disturbances, enabling the team to focus on their work and priorities. The team members emphasized the importance of team leaders in protecting the team from external disruptions, recognizing their crucial role in maintaining focus and enhancing productivity. The significance of agile leaders protecting their teams from external disruptions is supported by several authors [40, 63, 2]. Additionally, the interviews uncovered that the team members expressed their satisfaction with

the technical lead's role in managing all communication. This aligns with the findings of Schwaber and Beedle's study, which highlights the importance of agile leaders shielding teams from unrealistic customer demands to promote efficiency [2].

Our findings indicate that some teams at Business have aligned goals with the teams at Digital, resulting in a desire to relocate these teams for improved collaboration. Polzer et al. argue that team functioning declines with greater geographical distance, and conflicts and reduced trust tend to increase when teams are separated [36]. Although their research focused on a geographical distance within the team, we consider their findings relevant between teams with shared goals and close collaboration as well.

Goals

We found a lack of clear and shared goals across PowerRide, PowerRide Digital, and individual teams. Different departments have different objectives, which has resulted in departments working in different directions. With support from Tripp and Armstrong's findings, we emphasize that goals for different teams and team members may not align with the overarching objectives of the organization, which leads to a lack of compatibility [48]. Establishing clear goals would foster a common vision and improve teamwork, aligning with Wageman's findings that well-functioning teams organize around shared goals [45] and West et al.'s recommendation of having shared goals [27]. The lack of clear and shared goals was also analyzed as a contributing factor to the complicated relationship between Digital and Business. This friction could ease by sharing business-oriented goals, as argued by West et al. [27].

Clarity and tangibility of goals can be achieved by breaking down the overarching goals into smaller, measurable targets at the team level. In addition to goals encompassing values such as profitability, growth, quality, and sustainability, it is essential to establish performance metrics for evaluating the efficacy of agile methods, as recommended by Tripp and Armstrong [48]. Key Performance Indicators (KPIs) are quantifiable measures of performance for specific objectives over time. We found that PowerRide Digital does not work with KPIs, even though it could contribute to clear goals.

Relation to Business

We found that there is a lack of understanding between teams at Digital and Business. Fostering a mutual understanding of how each division's work contributes to a shared, overarching goal would enhance comprehension and promote collaboration, according to Wageman's research on the importance of shared goals [45]. The absence of understanding concerning Digital's work and value generation poses a significant challenge. As highlighted in an interview, Digital's products function as enablers, making it challenging to quantify their impact in terms of car sales. Devaraj and Kohli emphasize the crucial significance of comprehending and using IT appropriately to fully acknowledge their value and achieve optimal effectiveness [69].

Most of our findings point to a lack of communication and collaboration between Digital and Business. This absence of communication leads to Digital receiving tasks from Business without any explanation of their purpose. Luftman suggests increasing the alignment between business and IT leaders to increase collaboration [68]. The employees at Digital have expressed feeling like a traditional IT support or a "feature factory" with no ownership of the solution. West et al. argue that teams should work problem-based and take ownership of the solution as one should when working agile [27]. Furthermore, Simard and Lapalme argue that power imbalances lead to fewer asked questions, decreased communication, and less feedback [44].

Transparency

We found varied perceptions regarding transparency within PowerRide. Based on the literature findings, there are no known risks associated with increasing transparency while adhering to legal and security boundaries. We argue that increased transparency would be beneficial, as emphasized by Moe et al., who stress that transparency is critical to avoid power imbalances [19]. Power imbalances are destructive for agile teams since they can cause coordination problems and limit the team's collective understanding, as recognized by Simard and Lapalme [44]. Open communication and transparency could help to overcome challenges of shared decision-making and improve the trust between team members, which Moe et al. suggested for succeeding with self-organizing [19]. Transparency was found to decrease the higher up in the organization level one gets, thereby highlighting the need of sharing the management's work and agenda better with the rest of the organization.

4.2.7 Guidelines

Based on our findings we propose the below presented guidelines to improve certain aspects related to agile leadership in PowerRide Digital, tailored to its specific context. The guidelines aim to achieve overall improvement rather than maximal agility since we acknowledge that fully embracing agile may not be the optimal solution for this organization. These guidelines aim to assist team members, leaders, and management in addressing leadership-related issues and improving the application of agile development. However, it is important to note that the guidelines are tailored to the specific context of this organization and are not necessarily applicable to other organizations. The guidelines are grounded in the applicability and adaption of agile leadership concepts, addressing RQ1 and RQ2, which were presented in section 1.1. Primarily, they aim to answer RQ3 by providing concrete guidelines to support leadership within the three studied contexts.

Table 4.4 outlines the guidelines and identifies the respective organizational levels responsible for their implementation. The intended effects on the implementations are however aimed to benefit the whole organization. At the team level, the entire team, including the digital lead, technical lead, product owner, and Scrum master, is included. Team Mgmt encompasses leadership roles such as DPM and road map

lead roles that are seen as above the development team level. Digital Mgmt refers to the management of the Digital department, and PowerRide Mgmt refers to the management of the entire PowerRide organization. Although some guidelines require collaboration from various levels and affect the whole organization, the table primarily focuses on the main responsibility for driving the actions that each guideline implies. If several levels are mentioned as responsible, it indicates that they could be responsible for different parts or decide which level is most appropriate for the ownership. Figure 4.2 visually represents the specific organizational levels accountable for each of the guidelines. This diagram serves as a complementary visual aid to Table 4.4, offering a comprehensive overview of the distribution of responsibilities within the organization. It can be utilized as a reference tool to gain a better understanding of the overall structure and allocation of duties within the organization.

The guidelines are categorized into five themes, which are illustrated in Figure 4.4. The emergence of these themes can be traced back to the themes of key aspects found after the group interviews and follows the same pattern as the summary of findings. Some guidelines themes are more connected to the key aspects themes than others, as a result of different findings from the two interview rounds. Which key aspects theme inspired which guidelines theme is illustrated in Figure 4.3 by connecting them with arrows.

As an attempt to illustrate the connection between agile leadership concepts and the guidelines, the guidelines were grouped into the three sets of a Venn diagram. Figure 4.5 presents the Venn diagram that maps the guidelines, comprising the two agile layers of processes and tools, as well as leadership and mentality, along with an organizational set outlining actions that should be taken to optimize the organization. The diagram depicts the relationships between the guidelines and specifies the value(s) a particular guideline contributes to. Notably, guidelines in the two agile sets may enhance agility, while those in the organizational set may lead to a less agile organization but offer other benefits that contribute to an optimal, hybrid approach, organization.

Way of working

G1: Framework for the way of working - To reduce confusion, it would be helpful to establish a framework that outlines how teams should work and organize. The framework should clearly define which agile practices and ceremonies teams should adhere to and in which areas teams can exercise autonomy. By gathering the best practices, underperforming teams can learn from the successes of others, and new teams can quickly organize themselves more effectively. Training for these practices should also be offered. More specifically, the following suggestions (G2-G6) should be included in the framework:

G2: Three amigos - The three amigos ceremony has received positive feedback from teams that have implemented it. This practice can be suggested to teams that struggle with communication and collaboration between Business and Digital roles. By incorporating diverse perspectives,

the quality of outcomes can be enhanced.

G3: Retrospectives - Retrospectives provide a valuable platform for reflection and feedback. This practice fosters continuous improvement and enables teams to evolve to higher levels of maturity by addressing conflicts, discussing issues, and celebrating successes. We suggest ending every sprint with this ceremony.

G4: More minimum viable products - The PowerRide teams often work in large projects. By adopting a minimum viable product (MVP) approach and delivering incremental solutions to stakeholders, the team can iterate on the product multiple times, ensuring it meets the requirements and users' needs. This approach reduces the effort spent on unnecessary development and results in higher-quality outcomes.

G5: Less remote work - Whenever possible, it should be encouraged to work collaboratively from the office, as it has been shown to improve various aspects of teamwork. In-person meetings enable the development of personal relationships and self-organization. Additionally, the ability to share ideas and build inter-team connections can occur spontaneously during informal conversations in the hallways while working from the office.

G6: Common sprint schedules - All teams that have dependencies should be coordinated by following a common scheme. Sharing the same sprint schedule across the organization makes it easier to plan and synchronize teams for inter-team-dependent work. Based on the experience of a team member who was interviewed, the sprint cadence should be at least three weeks.

Organization structure

G7: Refine the organization structure - Some of the identified issues can be traced back to the organizational structure, such as having too many leadership titles and an excessive number of leaders compared to the number of developers and business analysts. Additionally, there is a lack of understanding between Digital and Business's work and needs. The communication is poor and there are no clear guidelines for decision-making or prioritization in certain situations. To address these issues, the following guidelines G8-G11 are recommended:

G8: Clarify roles and use common titles - As demonstrated in the case of PowerRide Digital, organization-specific titles may result in varied interpretations and, therefore, different practices of these roles. Using commonly known role titles facilitates understanding of their responsibilities and mandates. Additionally, the role descriptions should be comprehensive, clear, and understood by all employees, ensuring that all roles are fulfilled and that employees know whom to turn to when encountering uncertainties. External agile coaches could be engaged to improve understanding, and discussions about the roles and their application in real-life situations could also help increase comprehension.

G9: Develop clear processes and procedures for decision-making - Clear processes and procedures for decision-making can help shorten the communication chain in situations where there is uncertainty about who makes the final decision. This would also alleviate any insecurities regarding which team can request what from whom and hopefully prevent initiatives from being frozen due to prioritization issues.

G10: Provide sheltering through the technical lead/Scrum master - Assigning the responsibility of sheltering the team from outside disturbances to one role can ensure this function. As sheltering is the Scrum master's responsibility in Scrum, we recommend assigning it to the role most similar to a Scrum master, which is currently the technical lead. However, if the role titles change according to our recommendations, this function should be assigned to the Scrum master.

G11: Relocate teams - By analyzing the interdependencies between teams, a more effective physical structure can be established. Currently, some employees have reported that certain Business teams have greater similarities with Digital teams, and relocating them to the Digital site could enhance collaboration. The obvious reason for the separation is to provide the necessary office space to accommodate the growing number of employees. While the physical distance between the two offices is currently impeding communication and collaboration, it could also promote a positive cultural difference and closer internal connections within the department.

Goals

G12: Clarify and break down common goals - Effective teams are those that work collaboratively towards common objectives. In the case of PowerRide, the high-level goals are challenging to apply in the Digital section of the organization. Since the success of digital solutions cannot be measured in the number of cars sold, alternative goals are necessary for this part of the company. The overarching goals should be divided into more specific objectives until there are clear and measurable targets for each team to work towards. Some interviewed team members prefer the goals to be determined top-down but influenced by input from the bottom-up. Although some individuals understand their purpose, others struggle to comprehend the mission and vision of the organization. The absence of direction from management negatively affects teamwork, as it is unclear which work should be prioritized. Additionally, it is difficult to assess team performance and progress. By clarifying the goals and breaking them down into measurable objectives, these concerns can be addressed.

G13: Introduce KPIs - The goals can be made more tangible and measurable by concretizing them into Key Performance Indicators (KPIs), which can aid in monitoring projects and assessing performance at both the team and organizational level. It is essential to carefully choose the KPIs to ensure that they accurately capture what they are meant to measure. Hence, we advise

the company to start by thoroughly investigating which KPIs to implement. Additionally, making these KPIs visible to all employees can contribute to transparency within the organization. However, it is important to discuss and clarify how the KPIs will be used, to prevent any negative consequences or perceptions of surveillance, while still capturing the most value from them.

Relation to Business

G14: Common forum for Digital and Business - To enhance communication and collaboration between Digital and Business, implementing a common forum, such as an intranet channel, can serve as a platform for sharing ideas, asking questions, and exchanging knowledge. This can create a more approachable environment and encourage open communication between teams of the two units, fostering a culture of transparency and collaboration. By providing a central platform for information exchange, employees can have access to relevant information and resources, leading to increased efficiency and productivity. Additionally, this platform can serve as a repository of best practices and lessons learned, allowing teams to learn from each other and continuously improve their work processes.

G15: Weekly stakeholder alignment meetings - Having weekly meetings with both the Digital and Business teams that are working on the same feature or project can bridge the gap between the teams and foster a better understanding of each other's work. Including feedback as a standard agenda item is crucial for achieving continuous improvement.

Transparency

G16: Accessible documentation of past decisions - Sharing documentation of past decisions within the organization promotes transparency among employees, which can increase their loyalty and save time by avoiding redundant discussions. Strategic decision-making is primarily handled by the Business side. By fostering transparency, this approach can reduce the gap between the Business and Digital teams.

G17: Demonstrate management's work on the town hall meetings - Town hall meetings can serve as a valuable platform for sharing the management's work and agenda with the rest of the organization, fostering a better understanding of their responsibilities and contributions. This creates an opportunity to build trust and align the organization toward a common set of goals.

Guidelines	Team	Team Mgmt	Digital Mgmt	PowerRide Mgmt
G1			x	x
G2	x	x		
G3	x	x		
G4	x	x		
G5	x	x		
G6			x	x
G7				x
G8			x	x
G9				x
G10	x	x		
G11			x	x
G12	x	x	x	x
G13		x	x	x
G14			x	x
G15	x			
G16			x	x
G17			x	x

Table 4.4: Table showing which guideline is aimed at which organizational level to take action on. Mgmt is an abbreviation of management and an x means responsible.

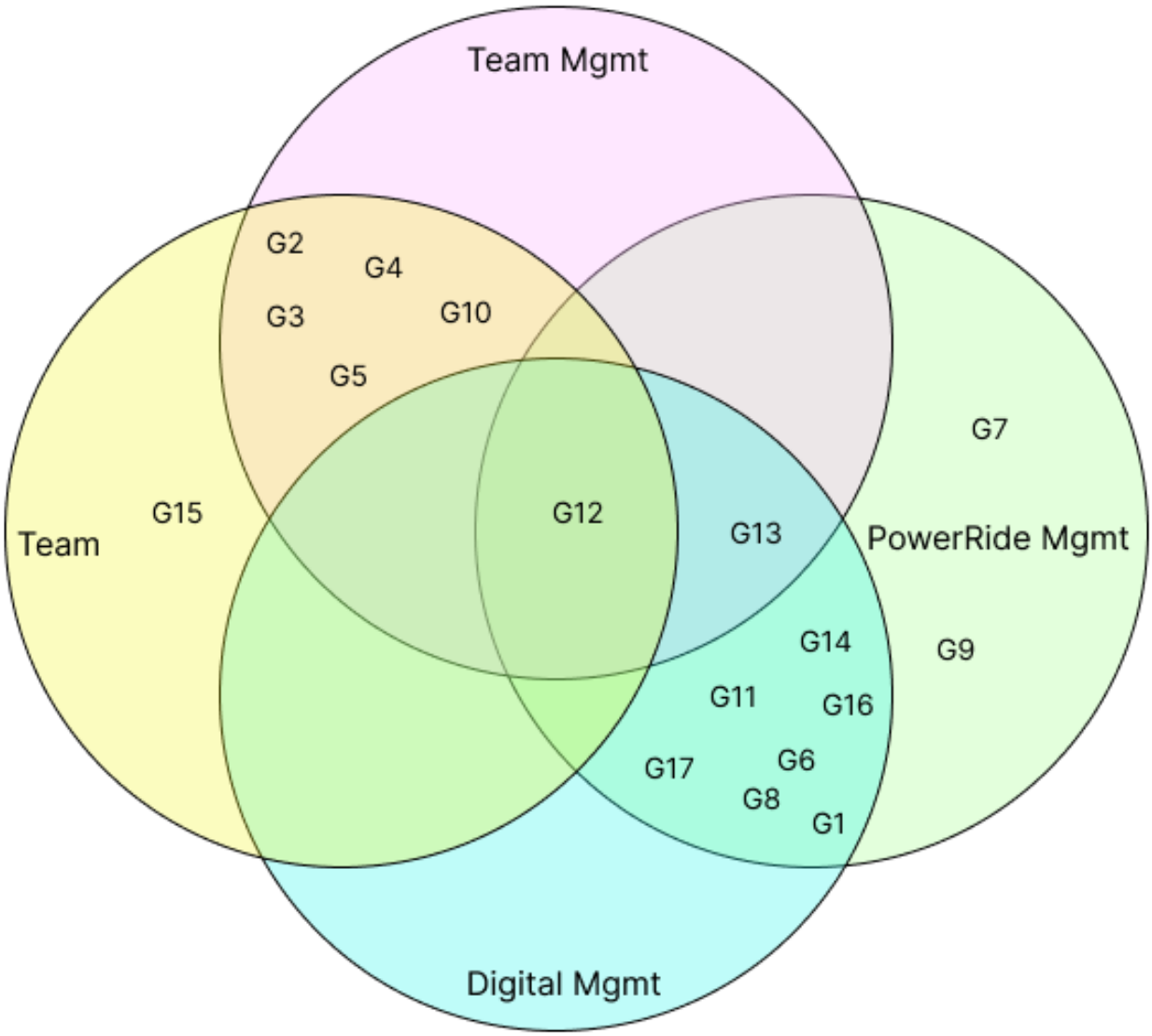

Figure 4.2: Guidelines mapped in a Venn diagram to show which guideline is aimed at which organizational level to take action on.

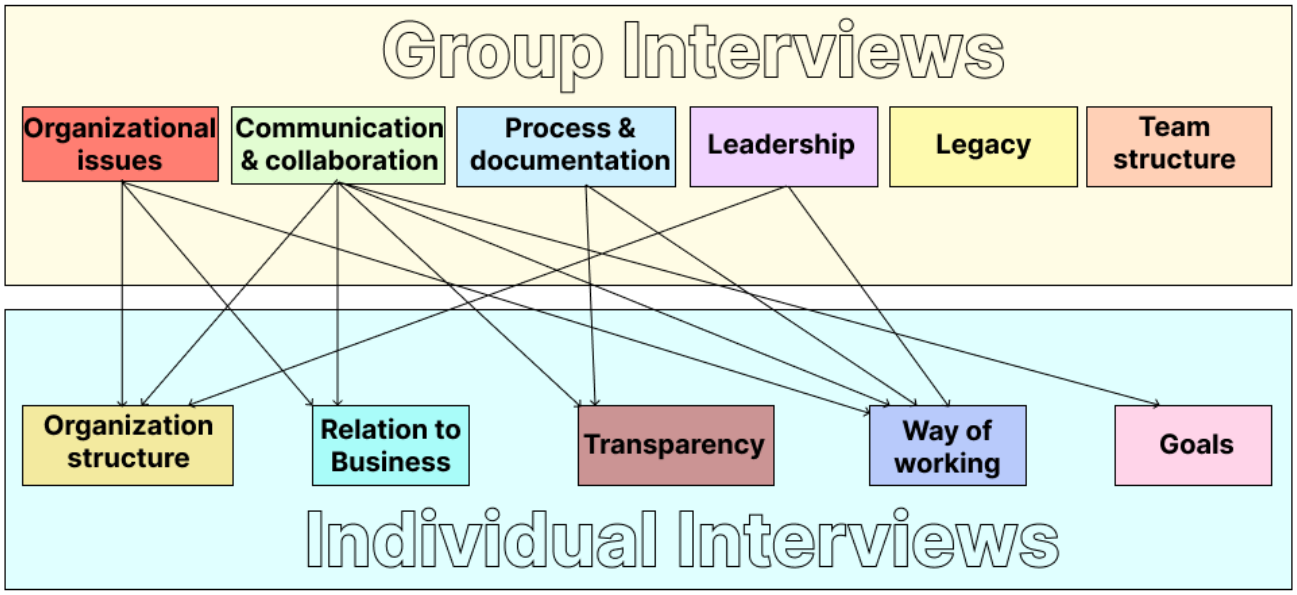

Figure 4.3: Illustration of how the themes developed from the individual interviews can be traced back to the initial themes from the group interviews. The arrows show which key aspects theme inspired which guidelines theme.

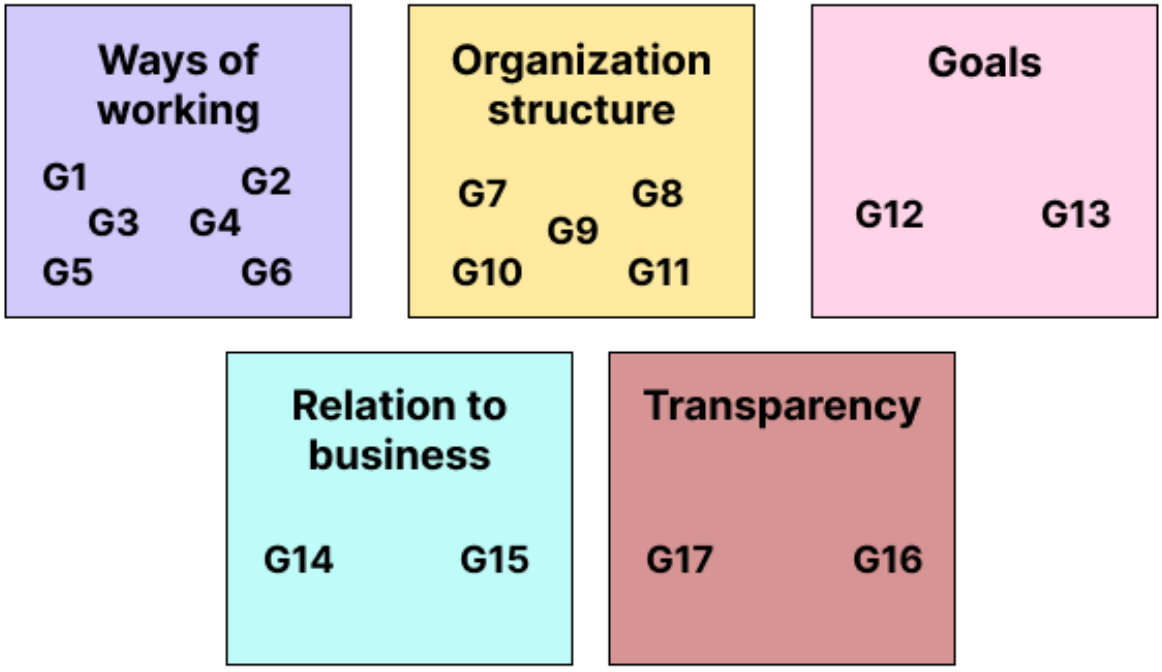

Figure 4.4: Illustration of the guidelines grouped in themes.

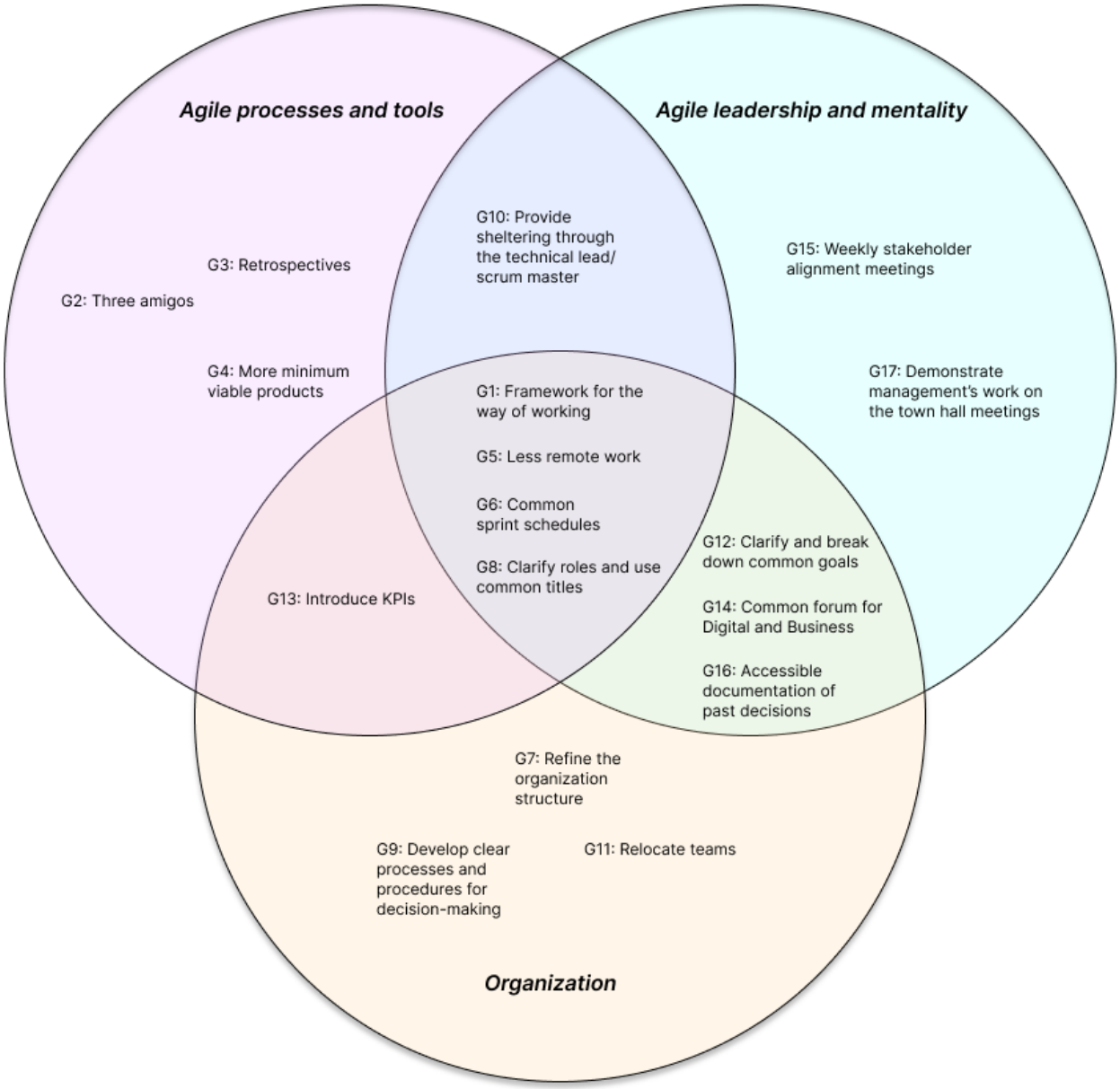

Figure 4.5: Guidelines mapped in a Venn diagram to show how they relate to the two layers of agile, i.e., processes and tools, and leadership and mentality, as well as organization-enhancing aspects.

4.2.8 Validation

In order to assess the relevance and usefulness of the proposed guidelines, five individuals statically validated them. To do this, they responded to two questions: (1) *Do you consider the guidelines relevant for your team, department, and organization? Please point out which specifically are relevant or not and briefly comment on why.* and (2) *Do you think the guidelines could be useful? Please describe why or why not.*. These employees have different roles, referred to as ”Leader” or ”Team mem-

ber" to keep anonymity. The reflections are presented in two tables below. Table 4.5 presents the reflections that were expressed for the guidelines in total, by showing which aspect they reflected on as well as their role. Two leaders expressed their reflections on relevance and usefulness separately, while two other leaders expressed them collectively. One of the leaders shared additional reflections that considered other aspects than relevance and usefulness. The aspect "Other" gathers both reflections that covered relevance and usefulness in general, as well as reflections on other aspects. Table 4.6 presents the reflections that were expressed specifically for each guideline, by showing the guideline's index and the employee's role.

Aspect	Reflection	Role
Relevance	Since PowerRide is a scale-up, most of the proposed guidelines can help us strengthen as one team but to be specific, the guidelines mentioned in G2-G5 & G10 are things we are working on within our teams to improve. For example, retrospectives help in improving and learning from mistakes, sheltering teams from outside disturbances helps deliver the set priorities on time and be more effective, and MVP helps in securing revenues rather than not being ready with anything.	Leader 1
	From a general perspective, I find most guidelines relevant from a meta-perspective. I may have differing opinions on the details but would agree on a conceptual level that any given guideline is relevant. To clarify: G5: "Less remote work" for example. On a detailed level, I could argue why we should do more remote work but agree that we should codify remote working behavior. Some guidelines (I am thinking of G2 as a good example) seem to be more of a useful tool or method to have in the Scrum master's toolbox rather than a fully applied guideline affecting work every day.	Leader 3
Usefulness	PowerRide is a growing organization, and to meet the challenges faced by a scale-up, we need to adapt to most of these guidelines and come up as a strong organization both Digitally and revenue-wise.	Leader 1
	Yes, the guidelines are useful. I was expecting some categories to be less useful for the team as an entity (while being more useful for other entities), but the guidelines under the "business" category for example, are highly useful for enabling a better development climate and correct alignment of expectations between stakeholders and the team.	Leader 3
Other	I think the recommendations are good.	Leader 2
	Good and wise insights overall.	Leader 5
	Some of these points aim at reducing team autonomy in favor of better alignment within the whole organization. To a point, that kind of alignment can potentially increase overall efficiency, but in some cases, I would expect some teams to feel tied to decisions being made above their head. The daily working process may differ between teams by the nature of the product they are building/maintaining, and there is a potential conflict in forcing ways of working on an incompatible product or team. Addressing and discussing these guidelines within a team, and on the rare occasion intentionally contradicting them would be a good way to customize and tailor the guidelines to the needs of any given team.	Leader 3

Table 4.5: Generally expressed reflections from the validation of the guidelines.

Guideline	Reflection	Role
G1	Relevant and useful. Would like to not have the same framework for all teams or products. Would like it to be optional, not mandatory.	Leader 4
G2	Relevant and useful. User story mapping methods by Jeff Patton et al. have been discussed.	Leader 4
G3	Relevant and useful. Should be mandatory to have in a learning organization	Leader 4
G4	Relevant and useful. Since this MVP, MVSolution, etc., comes in a variety of flavors, more specification is needed.	Leader 4
G5	Relevant and useful. Root causes for why some teams work as a group and not a team needs to be understood.	Leader 4
G6	Unsure about this. Deliveries are continuous, not sprint based. This might be a "relic" from SAFe.	Leader 4
G7	Very relevant and useful.	Leader 4
G8	Relevant and useful. This is already ongoing work.	Leader 4
G9	Relevant and useful. Needs to be improved.	Leader 4
G10	Relevant and useful. Related to G8 and G1. Need to clarify the responsibilities of a Scrum master/tech lead.	Leader 4
G11	Relevant and useful. Would like this to happen but not sure how to do something about it in the short term	Leader 4
G12	Relevant and useful. Already ongoing work.	Leader 4
G13	Relevant and useful. Working to clear goals creates engagement. It will be easier to understand if the work takes us in the right direction.	Leader 4
G14	Relevant and useful. This already exists in some way but more transparency is needed about how it works and how it can be improved.	Leader 4
G15	Not sure if this should be weekly, but yes, alignment meetings are important and any existing gaps need to be closed.	Leader 4
G16	Relevant and useful. This will create more transparency (which is one of our values) and avoid redundant decisions as the guideline describes.	Leader 4
G17	This happens already but could maybe be improved.	Leader 4

Table 4.6: Reflections from the validation of the guidelines that received particular input in the review.

5
Discussion

This study examines agile leadership concepts in new contexts, particularly in the development of enabling software products, for new ventures that emerge from larger traditional companies, and in the presence of multiple internal stakeholders. Three research questions were formulated: the first aims to explore the application of agile leadership concepts in different contexts, the second focuses on the adaptability of these concepts to diverse situations, and the third on guidelines to support leadership when issues arise in the aforementioned contexts. We discuss the findings in which sections 5.1, 5.2, and 5.3 address all three research questions from the perspectives of their respective contexts. Furthermore, section 5.4 discusses other relevant findings that extend beyond the specified contexts. All three research questions, with particular emphasis on the third, were systematically addressed by iteratively identifying themes within the results. These themes were then consolidated into key aspects, which were refined and expanded upon to formulate concrete guidelines. An explicit discussion of the findings in relation to the research questions is presented in section 5.5 Finally, we suggest potential areas for future research in section 5.6, and present potential threats to validity in section 5.7. Prior research has focused on other software development contexts, while our findings build on the knowledge base of organizations experiencing internal conflicts between agile and non-agile departments in growing product organizations, as seen in the case of PowerRide.

5.1 Development of enabling software products

This study suggests that the relationship between an IT department similar to Digital and other parts of the organization strongly influences the applicability of agile leadership concepts in enabling software product development. Concepts such as self-organizing teams, shared leadership, team maturity, and leadership functions implied by agile roles rely on certain conditions for successful implementation. These conditions include the presence of clear and shared goals, a high level of trust and communication, and autonomy. The conditions are in turn influenced by the relationship between departments, the collaboration within individual teams, as well as the guidance and support provided by leaders and management.

Our findings are in line with Luftman's argument that IT departments should be considered facilitators of corporate strategy, not just a support function [68]. To ease the friction between Digital and Business and improve the outcome, we suggest more

collaboration and common goals across the organization, as per Luftman's suggestions. In scale-up contexts where software development is not the core business, the coordination and support of agile methods across different teams and organizational levels are important. Empowering the IT department can enhance the organization's IT competence, thereby increasing its value as a business asset. Additionally, improving the inter-departmental climate through goal alignment and structural enhancements can enhance overall operational efficiency.

Regarding the applicability of agile leadership concepts from an autonomy and self-organizing perspective, conversations with Business and clear understanding of duties and responsibilities can help to operate more cooperatively and effectively, even though Digital partly is a support department. Self-organizing teams, which allow for greater collaboration and flexibility, are particularly valuable in enabling software product development. They enable teams to adapt to changes in requirements and priorities, ensuring that the software products meet stakeholders' needs and are delivered efficiently. Shared leadership can also be applied to this context, empowering team members to take ownership of their work and collaborate more efficiently. This approach, combined with a clear understanding of leadership functions and alignment with the team's overall objectives, can help the team deliver high-quality software products in a timely and efficient manner.

5.2 New ventures that spring from larger traditional companies

The study partly aimed to investigate the applicability of agile leadership concepts in new ventures that emerge from larger, traditional companies. The research involved determining the degree of legacy and assessing how inherited factors impact applicability today. Upon discovering that several PowerRide employees had previously worked at DriveForce, we considered Duvall-Dickson's [67] suggestion that employees can bring their former employer's culture, traditions, and practices to their new workplace, which may explain the legacy experienced by some PowerRide employees. Although their research focused on a merger and acquisition context, we consider their findings relevant to the relationship between DriveForce and PowerRide as well.

Some agile leadership concepts may be less applicable when legacy systems or skepticism from employees hinder agile ways of working. For instance, bad experiences from implementations at the parent company may cause resistance to change. At PowerRide, skepticism about SAFe arose because of bad experiences with DriveForce's implementation of the agile framework. Similarly, some employees were reluctant to follow the Scrum framework due to previous experiences of endless meetings.

Team maturity is critical to the successful adoption of agile practices. For a new venture, team maturity may be hampered by the rapid growth of the number of employees causing unstable teams. The addition of new members can change the

maturity stage, impacting their ability to self-organize and adapt to changing requirements. By assessing the team's maturity level and providing the necessary support and training, the team can mature, acquire the skills and experience needed to effectively implement agile practices, and deliver high-quality software products. Without a proper assessment of the maturity, it becomes challenging to determine the true level of maturity for PowerRide Digital's teams based solely on interview responses. It is unclear whether the perceived maturity is genuine or simply relative to the individual's past experiences. Furthermore, one participant claimed that there are no mature teams at PowerRide at all. Low team maturity may cause difficulties in self-organizing, understanding agile principles, and adapting to changes in requirements. Mature teams have a greater chance of successfully adopting advanced agile practices which can increase productivity and efficiency.

5.3 Multiple internal stakeholders

The study furthermore investigated the applicability and adaptability of agile leadership concepts in the context of multiple internal stakeholders. Our findings suggest that implementing more agile ways of working could improve the relationship between Digital and its internal stakeholders. This can be achieved by increasing flexibility, adaptability, and response to changing requirements, which is an extension of Highsmith's findings that agile methods enable IT initiatives to respond to shifting stakeholder requirements [74]. While Highsmith focused on external stakeholders, we argue that this aspect is true for the internal stakeholders in the case of PowerRide as well.

Connected to the autonomy needed for shared leadership, the ability of the Digital teams to prioritize their work and make decisions may be restricted due to stakeholders on the Business side having the final say. This, in turn, negatively influences the evolution of self-organization and team maturity.

Furthermore, our findings provide insights into the potential challenges of implementing scaled agile in a growing organization like PowerRide. Similar to Dikert et al.'s findings of issues in interfacing with unique organizational functions when applying agile to larger projects [55], we claim that scaled agile is not an easy option for PowerRide due to the organization's growth and differences from a pure software development company. Moreover, we found a distance between the development teams in the Digital department and their stakeholders. As Dikert et al. stated, a large-scale agile approach poses a risk of increasing such a distance. This serves as another argument for not relying on a large-scale agile transformation. However, some elements from the large-scale approach are needed for coordination, decision-making, and goal alignment. Focusing on our findings of a lack of clear goals, research from Misra et al. suggested that the adoption of agile on a large scale requires a shift from long-term project planning to a shorter-term one [57]. This limited planning can be troublesome when relationships with businesses and customers are founded on long-term roadmaps, as also mentioned by Boehm and Turner [53]. In the case of PowerRide, the ultimate deliverable, the car, is founded

on long-term planning and roadmaps. If an agile transformation on a larger scale is still desired, a solution for combining long-term goals with shorter-term project planning is needed. The proposed goal breakdown can contribute, but the overarching goals need to be flexible and adaptable to allow the lower-level goals to be addressed in an agile manner.

Conflicting priorities and needs of multiple internal stakeholders are found in the case of PowerRide. The stakeholders at Business desire more features while Digital aims to enhance performance. Coordination, shared objectives, improved communication, and mutual understanding between Digital's teams and the rest of the organization is needed to cope with this conflict. Transforming a relatively large company to an optimal organizational structure is undoubtedly more complicated than transforming a single development team to agile. Similar to Simard and Lapalme, we call for further research to understand how agile teams can effectively collaborate with the rest of the organization [44].

Our finding that poor communication and coordination hinder successful multi-team project execution and integration of agile practices is similar to what Hoda and Murugesan found when studying the difficulties self-organized teams encounter when managing projects at several levels [50]. They advise using planning to create a shared understanding between the team and the stakeholders, similar to how we recommended the three amigos ceremony in the guidelines. Furthermore, they suggest knowledge sharing to cope with the difficulties of cross-functional teams. We suggest that the exchange of knowledge occur between teams in different departments since the lack of understanding between Digital and Business is described as troublesome in this case.

Gemino et al. have found that a hybrid project management approach that combines agile methods with traditional project management ones, can deliver the same quality and scope as traditional approaches without additional resources, while also achieving stakeholder success similar to agile approaches [59]. Therefore, we suggest that organizations similar to PowerRide focus on combining agile practices with traditional ones to create the best possible hybrid approach for their unique contexts. Therefore, we claim that fully transitioning to agile is often not the optimal choice for larger organizations with multiple functions, especially when software development is not the primary business. Different approaches can be integrated to generate better outcomes. However, a hybrid approach should not be equated with having no approach at all. Defining and continuously improving the approach is critical to enabling it to mature into a suitable and effective hybrid. Consistent with our findings on the importance of goals, West et al. have emphasized the significance of shared business-oriented goals in reducing the friction between business and development, and in balancing functionality and quality in software projects [27].

5.4 Other findings

In PowerRide Digital, our findings align with two of the four fundamental values of agile methods [4]. Prioritizing individuals and interactions over processes and tools is fulfilled by teams experiencing autonomy in selecting their own processes and tools and working software seems to be prioritized over comprehensive documentation based on findings of scarce documentation. However, our study suggests that customer collaboration and stakeholder engagement need to improve to fulfill the third agile value of ”customer collaboration over contract negotiation”. Regarding the fourth value, we found that adhering to strict deadlines may impede the ability to respond to change.

Regarding the collective applicability of agile leadership concepts for the three contexts, we identified the importance of roles and common agreements. At PowerRide, we observed that some teams were able to experience the advantages of agile leadership, even in the absence of a dedicated Scrum master. These teams were reported as being close to self-organizing, which suggests that the organization fosters an environment that allows for some benefits of agile leadership to be realized without rigidly adhering to an agile framework.

Our study revealed that frequent face-to-face meetings were a success factor for well-functioning, self-organizing, agile teams, consistent with the findings of Hidalgo [49]. On the other hand, we found that unclear expectations and a lack of common understanding regarding leadership in agile teams could lead to frustration, in line with Spiegler et al.'s previous work [16]. Similarly, our findings support Spiegler et al.'s findings that vagueness regarding roles and responsibilities leads to uncertainty that can result in no one taking on leadership roles, creating a leadership vacuum.

We suggest that agile leaders must be flexible and adapt to the context. Although self-organizing teams should not be leaderless, several studies suggest that agile leaders should step back as the team matures, and other team members take on leadership roles [3, 34]. However, we cannot conclude the extent to which PowerRide leaders tend to step back or what the optimal gap size is for individual teams.

Finally, we argue that no specific agile framework is best for all organizations. Instead, organizations must strive to find their optimal balance between agile and other organizational methodologies, which will improve through continuous adaptation of methods, processes, and structures based on feedback from across the organization.

5.5 Considering the research questions

In addressing RQ1: *How applicable are agile leadership concepts to new contexts?*, we claim that the applicability of different concepts varies depending on the specific context. Team maturity can be assessed in any kind of team, regardless of the context. However, the actual maturity of a team and its evolution can be influenced by

various circumstances, such as the context. In an immature team, it can be difficult to successfully share leadership and self-organize due to low levels of communication, collaboration, and productivity. In the case of a new venture, achieving high levels of team maturity, self-organization, and shared leadership can be challenging due to rapidly changing teams.

In the development of enabling software products, power imbalances caused by lacking mandates can hinder self-organization. However, if teams get problems to solve instead of orders to deliver from stakeholders, they will more easily self-organize. Self-organizing can be a particular strength in the context of multiple internal stakeholders as the agility and responsiveness to changing requirements increase. Achieving mutual understanding across the organization is crucial for teams to evolve into self-organizations.

Shared leadership enables team members to take ownership of their work, which is important in any context. However, it can be more challenging to share leadership in contexts where the team is far from decision-making, as leadership requires information. To empower teams that develop enabling software products, decisions must be clearly communicated and transparent. When working with multiple internal stakeholders, the team's ability to prioritize their work and make decisions may be limited. Shared leadership improves shared understanding within the team, strengthens the team's negotiating power in collaboration with stakeholders, and positively impacts teamwork.

When developing enabling software products, there is a risk of being treated as traditional IT support and receiving commands without room for ownership of the problem and solution. Agile leader roles are needed to shield the team from overwhelming requests, understand, contextualize, and communicate the bigger picture, explain the purpose to the team, and elicit requirements properly. Understanding the root cause of the problem is crucial to the agile strength of adapting to changing requirements. As a new venture grows, the risk of leadership functions falling through the cracks increases, and therefore, thorough role descriptions are necessary. When working with multiple internal stakeholders, clearly defined leadership functions can be advantageous to know who to contact regarding stakeholders.

With regards to RQ2: *How can the agile leadership concepts be adapted?*, we assert that agile leadership concepts can and must be adapted to an organization's specific contexts. Agile frameworks are developed from and aimed at small-scale software development contexts, and when applying them in other, more complex settings, the optimal methodology may be a hybrid approach rather than the original agile framework. Organizations are by nature complex and dynamic, and changes must be faced with a willingness to adapt other parts of the organization as well. If new team members join a team, the maturity of the team may change, affecting the team's ability to self-organize and creating a need for a more present agile leader. Failure to adapt agile leadership to changing circumstances can negatively affect team collaboration and outcomes. Similarly, various agile methods can be adopted,

but only bring value if enough time is dedicated to actual tasks, rather than spending an excessive amount of time on ceremonies and other aspects of planning for agility. Thus, it is essential to strike a balance that considers both task and team characteristics. Furthermore, certain aspects of the actual business must be taken into consideration. In the case of PowerRide, strict product launching deadlines hindered an agile mentality by focusing more on meeting the deadline than on product performance and meeting user needs. Business was described as sometimes working with a Waterfall approach, which points to development driven by deadlines. There were also findings of changing requirements, but it was unclear whether they were caused by changing deadlines or changing needs. The latter would point to a more flexible and agile approach. A hybrid approach that combines agile frameworks with other practices can be used to create a tailored mix that suits the specific organization. Employee satisfaction, stakeholder needs, and business outcomes are more important artifacts than a full transformation to agility. However, it is important to actively organize by defining a framework with a clear structure, assigning roles and responsibilities, and providing training and support, to ensure all team members understand expectations and know when they can make decisions together or for themselves. The framework is needed to support situations when decision-making power is unclear and when agile leadership fails. A framework reduces chaos, allowing for a more flexible adaptation of agile leadership concepts to achieve better outcomes.

In addressing RQ3, *What would be concrete guidelines to support leadership when issues arise?*, we proposed 17 guidelines to assist leadership and contribute to general improvement. These guidelines were based on issues identified in the studied organization and supported by agile leadership theory.

We selected the guidelines based on successful cases previously described in the literature, with a particular emphasis on factors that multiple interviewees highlighted as significant. Additionally, some guidelines, such as G2: *Three amigos* and G11: *Relocate teams*, were developed primarily based on success stories within the studied department. However, some guidelines we considered were not included due to insufficient supporting data and theoretical grounding.

The Venn diagram depicted in Figure 4.5 illustrates the relationship between the guidelines and three key aspects: the dual layers of agile encompassing (1) processes and tools, (2) leadership and mentality, and (3) organization-enhancing factors. While some guidelines contribute solely to one of these categories, others have an impact on two or all three, thus occupying the intersecting regions. Guidelines falling within the agile layers primarily enhance agility, whereas those within the "Organization" set aim to improve the overall functioning of the organization, regardless of agile considerations. In fact, some of these guidelines may even trade off agility in favor of establishing a well-functioning organization.

Analyzing the guidelines individually and their placement within the Venn diagram, *G1: Framework for the way of working* is placed in the intersection of all three

sets. It ensures the appropriate adoption of agile processes and tools, enhances agile leadership and mentality by allowing teams autonomy in various areas, and contributes to organizational improvement by guiding effective team organization. Similarly located in this intersection are *G5*, *G6*, and *G8*. *G5: Less remote work* aims to increase team performance and foster self-organization, in accordance with Hidalgo's findings [49]. Self-organizing is a concept within agile leadership and mentality, while reducing remote work is an adjustment to the agile processes and tools. It also relates to the organization by considering its operational aspects. *G8: Clarify roles and use common titles* increases agility by incorporating common agile roles, which can be viewed as a process and tool artifact, and similarly increases the agile leadership and mentality. The organization benefits from clarified roles, addressing issues that hinder efficient decision-making, collaboration, and the fulfillment of essential leadership functions. *G13: Introduce KPIs* aims to establish key performance indicators (KPIs) for measuring organization performance and evaluating the effectiveness of applied agile methods, following the recommendation of Tripp and Armstrong [48].

G2: Three amigos, *G3: Retrospectives*, and *G4: More minimum viable products* are all classified as "Agile processes and tools" guidelines since they promote the adoption of additional agile processes and tools. *G10: Provide sheltering through the technical lead/scrum master* aims to use a role defined in the Scrum framework, to contribute to agile leadership. *G15: Weekly stakeholder alignment meetings* seeks to facilitate continuous improvement and foster stakeholder collaboration, which are integral components of the agile mentality values outlined in the Agile Manifesto [26]. *G17: Demonstrate management's work on the town hall meetings* is recommended for the sake of transparency, a crucial factor emphasized by Moe et al. [19] in achieving successful self-organization. Moving to the intersection between "Agile leadership and mentality" and "Organization", *G12: Clarify and break down common goals* empowers agile teams to work towards common goals, aligning with the findings of Wageman [45], as well as ensures the organization is aligned and works in the same direction. *G14: Common forum for Digital and Business* fosters agile stakeholder collaboration between Digital and Business, bridging organizational gaps. *G16: Accessible documentation of past decisions* enhances open communication and transparency, thereby contributing to both an improved organizational environment and the values of agile leadership and mentality.

Regarding the "Organization" guidelines, *G7: Refine the organization structure* does not increase agility but improves the collaboration and outcomes for the organization with other means than agile methodologies. *G9: Develop clear processes and procedures for decision-making* can be seen as reducing team autonomy by establishing a structure, but it can actually increase the teams' decision-making abilities by defining a structure that gives the teams decision-making power. This aligns with the insights of Moe et al. [19], who explored the challenges of shared decision-making and suggested the development of clear processes and procedures for effective decision-making, providing motivation for *G9*. Furthermore, the recommendation *G11: Relocate teams* stems from the findings that some teams at Business have more

in common with Digital, and would collaborate more effectively if they were located on the same site.

Upon reflection on the provided guidelines, the majority of the participants found them useful and applicable. The guidelines serve as recommendations, and many participants expressed that they provided valuable insights and guidance. However, despite the overall positive response, a few guidelines generated some uncertainty among some participants. Specifically, G6 and G15 were identified as particularly challenging to comprehend and apply to their work by one leader.

Regarding G6: *Common sprint schedules*, a participant noted that deliveries are continuous rather than sprint-based, rendering the guideline potentially useless. As teams may have different deliverables and project sizes that result in varied sprint lengths, it is important to acknowledge these differences and allow teams to adjust their sprint lengths to fit their specific needs.

The uncertainty concerning G15: *Weekly stakeholder alignment meetings*, also pertained to time alignment, with one participant expressing concerns that weekly meetings could be problematic. While the guideline underscores the importance of regular schedule and progress alignment, we acknowledge that teams may have different preferences or constraints that make weekly meetings challenging. Thus, the frequency of alignment meetings should be determined based on what works best for the teams involved. Some teams may benefit from weekly meetings, while others may prefer less frequent or alternative formats. Ultimately, the timing and frequency of these meetings should be decided based on the project's needs and the involved teams to ensure that everyone is aligned and working towards the same objectives.

Another leader expressed that some of these guidelines aim at reducing team autonomy in favor of better alignment within the whole organization. The team's autonomy risks being compromised when decisions are made without their input. Additionally, they highlighted the challenge of establishing a shared sprint schedule due to variations in working processes across teams, influenced by the nature of their respective products, which may not be compatible. However, as the leader also suggests, we posit that these concerns are valid but can be addressed through team discussions, allowing them to select, customize, or disregard specific guidelines based on their unique circumstances.

5.6 Suggestions for future research

A promising avenue for future research is to examine the perspectives of Business and include their views on the topics and themes studied. Additionally, interviewing top management could provide strategic insight into the reasons for the current roles, goals, and organizational structure. A more detailed investigation of different teams could reveal patterns between well-functioning and malfunctioning teams, leading to the identification of effective practices and areas for improvement. This could re-

sult in the development of more reliable and detailed best practices and frameworks. Furthermore, it would be valuable to explore how agile work methodologies could be leveraged within the organization in greater detail, taking into account additional factors when evaluating the suitability of agile practices for different departments and settings.

Another perspective on this study could be gained by using a different data collection approach. While this study relied primarily on qualitative interviews, an alternative method could involve surveys or questionnaires to gather quantitative data that can be compared to the qualitative data obtained from this study's interviews. This could provide a more comprehensive understanding of the prevalence of different views and phenomena and identify more reliable patterns.

Alternatively, a case study could be conducted on a company with a similar structure and work methods that has successfully implemented agile work methodologies. This approach would provide an opportunity to investigate their best practices and learn from their experiences. The insights gained from this investigation could be valuable for successfully transforming to agile and improving team collaboration, communication, and productivity. However, finding such a success story in practice might be challenging.

Another approach would be to use action research, which involves conducting research while taking action at the same time. In this case, the action would be to implement the guidelines and study the effects. Furthermore, the guidelines could iterate by evaluating and rewriting them based on the results, rather than simply validating them statically. The researchers involved in the process would be highly involved and obtrusive, in contrast to this study's case study approach. Similar to this study, the level of realism would be high and the generalizability of the findings would be low.

Furthermore, it would be valuable to delve deeper into the effects of remote work on agile leadership concepts. The increasing prevalence of remote work necessitates a comprehensive understanding of how teams can collaborate and communicate efficiently in a virtual environment, how agile methods can be adapted, as well as which practices can be employed to enhance remote team performance. This could be studied in the three contexts of this study with a case study approach.

5.7 Threats to validity

There is a potential risk that the interview results may not accurately reflect reality due to various human factors. For instance, one possible scenario is that a participant may have felt pressure to hold back and not speak freely during the interview. Another possibility is that a participant may not have been entirely truthful, out of fear of negative consequences such as punishment for criticizing leadership within the team or organization.

Another threat to the study's validity is the relatively small sample size, which may have impacted the findings and proposed guidelines. Since leadership is subjectively perceived and context-specific, the findings may not apply even to the specific organization studied in this case. What one person perceives as a flaw may be viewed as a success factor by another. Additionally, selection bias is another threat to validity. It is possible that the participating interviewees may not have represented the entire population. For example, if the study only selected participants from certain groups within the department, the findings may not apply to the department as a whole. Different leaders and roles may have varying definitions and actions, which could affect the results of studying a particular aspect.

Measurement bias is also a potential risk. This can occur if the researchers' interpretation of the responses is biased. For instance, if the interviewer has preconceived notions about what constitutes good leadership, they may unconsciously interpret the responses in a way that confirms their beliefs.

Another threat to validity is the potential misinterpretation of the contexts of the case study company. If there are other contexts that are the underlying causes impacting the applicability and adaptability of leadership concepts, then the findings and guidelines presented in this study are specifically tailored to those alternative contexts rather than the ones initially stated.

6
Conclusion

Leadership is a crucial element for the success of projects and organizations. However, the implementation of agile processes can result in complex organizational mixtures with unclear role responsibilities. This study investigated the applicability and adaptability of agile leadership in new contexts, namely the development of enabling software products, new ventures that emerge from larger traditional companies, and environments with multiple internal stakeholders. By using a case study approach that prioritizes qualitative interviews for data collection, this research provides valuable insights into challenges that arise in these contexts and how agile leadership can be adapted to overcome them.

The findings of this study suggested that relying solely on a specific framework is no sustainable approach. However, structure and clarity in ways of working are essential to achieve a well-functioning organization. By combining agile with non-agile practices, teams can improve collaboration, leadership, and outcomes. Agile concepts have been proven to apply to new contexts, but their success depends on several circumstances, such as the context and the organizational needs.

This study concluded that the relationship between an enabling software development department and the business side of the organization strongly influences the application of agile leadership concepts. The implication for other organizations is that ways to bridge the gap need to be figured out to enable collaboration, communication, and mutual understanding across the organization. Common goals and goal breakdowns, collaborative agile ceremonies, and defining a framework are suggested to cope with these issues, as well as to address other identified issues such as decision-making, roles, and responsibilities. Moreover, the study found that the growth of an organization in terms of employees results in unstable teams, which impacts the implementation of agile leadership concepts in practice.

Specific guidelines and recommendations for leaders and team members were developed and evaluated to support agile leadership in these contexts. The guidelines aim to improve the overall performance and collaboration within PowerRide's organization. The focus is on establishing a clear framework for the way teams work and organize, refining the organizational structure, clarifying and breaking down common goals, enhancing the relationship between the Digital and Business units, and promoting transparency. These guidelines underwent a validation, confirming their relevance and usefulness. Upon reflection on the provided guidelines, the majority of the participants found them useful and applicable. The guidelines serve as recom-

mendations, and many participants expressed that they provided valuable insights and guidance. The findings of this study enhance the understanding of the concepts that need to be adapted when working agile in new contexts. By comprehending these aspects, leaders and team members can take action to adapt agile leadership concepts and methods to better suit the organization's needs.

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A

Appendix 1

A.1 Introduction to Interviews

Welcome to this interview on the subject of Agile Leadership in new contexts. The purpose of this interview is to contribute to a deeper understanding of how agile leadership works or could work within PowerRide Digital due to its contexts.

Our research aims to find out how agile leadership models can be adapted to these contexts and what concrete guidelines can be developed to support leadership when issues arise. To achieve this, we will analyze the leadership within development teams at PowerRide Digital, and investigate how agile models have been implemented, what works well, and what could benefit from a change.

We appreciate your input and value your privacy. It is important to note that any information you provide during this interview will be handled with the utmost confidentiality and anonymity. We will however refer to your role when presenting the results from this interview (such as leader or developer), but your responses will not be linked to your identity and will only be used for research purposes. No manager, colleague, or anyone else will see your answers before they are anonymous.

We would like to ask you for your permission to audio record this interview to transcribe it afterward? The audio recording will not be shared with anyone else and be deleted as soon as the report is finalized.

Please feel comfortable and open in sharing your thoughts and experiences, as they are critical to our understanding of the topic at hand. If you have any concerns or questions about the handling of your data, please do not hesitate to ask. You can also contact Andreas Sandberg or our supervisor from Chalmers, Robert Feldt if you have any questions you don't want to share with us.

In this interview, we will discuss your experiences and perspectives on agile leadership within the context of PowerRide Digital. To ensure that we are on the same page, let's establish some definitions of key concepts.

- Agile leadership is a style of leadership that emphasizes collaboration, flexibility, and continuous improvement, and it is often applied in software development teams that use agile methodologies.
- A new context refers to a situation or environment that is different from what

is typically experienced or encountered, such as the development of software products that are not part of the main product, new ventures from larger traditional companies, or multiple stakeholders involved.
- We define leadership as a function rather than a role. With this definition, there can be sufficient leadership within a team without having an outspoken leader.
- Team maturity refers to how developed the group is. This concept is based on the ideas of Tuckman and Wheelan, where groups are seen as going through certain stages toward becoming a well-functioning and productive team.

With these definitions in mind, let's dive into the interview and explore the situation of agile leadership in your team.