# EXPLORING THE IMPACT OF HYBRID WORK IN THE SOFTWARE SECTOR THROUGH THE LENS OF SELF-DETERMINATION THEORY

Lappeenranta-Lahti University of Technology LUT

Master's Program in Software Product Management and Business

2025

Kasuni Gayanthika Sugathadasa

Examiners: Ms. Maria Paasivaara - Professor (Tenured) | Software Engineering

Ms. Sonja Hyrynsalmi – Post Doctoral Researcher | Software Engineering

ABSTRACT

Lappeenranta-Lahti University of Technology LUT

LUT School of Engineering Science

Software Engineering

Kasuni Gayanthika Sugathadasa

# Exploring the Impact of Hybrid Work in the Software Sector Through the Lens of Self-Determination Theory

Master's thesis in Software Product Management and Business.

2025

119 pages, 14 figures, 10 tables, and 14 appendices.

Examiners: Ms. Maria Paasivaara - Professor (Tenured) | Software Engineering, and Ms. Sonja Hyrynsalmi – Post Doctoral Researcher | Software Engineering.

Keywords: Hybrid work, Software, Scrum Master, Self-Determination Theory, Autonomy, Competency, Relatedness.

The modern workplace, particularly for industries heavily reliant on technology, has shifted toward a hybrid working environment. This study considers the Self-Determination Theory (SDT), a motivation theory that explains the importance of autonomy (the extent to which one has freedom in their own behavior), relatedness (the extent to which one is connected to others), and competency (the extent to which one is effective and capable of performing activities). With the perspective of this theory, this study examines how hybrid work influences the professional growth, job satisfaction, and overall well-being of Scrum Masters in the software industry. Data are collected through interviews with ten Scrum Masters, consisting of both male and female Scrum Masters in the software industry.

Although remote flexibility enables autonomy and work-life balance, it can limit team integration and networking, which may hinder relatedness and professional development. Such findings bring the need for organizations to adopt an inclusive strategy to address such challenges and create an enabling environment for Scrum Masters in the software industry.

In the hybrid environment, it improves autonomy in planning, scheduling, and prioritizing tasks, while also improving decision-making capability through collaborative team environments. Digital tools help to bridge the gap between in-person meetings. Further, a hybrid environment

provides flexibility in accessing learning and training resources. However, it also requires considering challenges such as project instability, technical limitations, and unclear boundaries between work and personal life. Therefore, incorporating these findings into recommendations for organizational policy improvements in a hybrid working environment may enable a more inclusive experience of hybrid work in the future.

ACKNOWLEDGEMENTS

The research was conducted in 2024-2025.

First, I would like to thank Ms. Maria Paasivaara, a Professor (Tenured) in Software Engineering. From the identification and finalization of the thesis topic to the successful completion of the study, I was lucky to get valuable support and guidance from her. Her networking and knowledge played a significant role in this study. It was a great opportunity to work on my master's thesis under her supervision.

Further, I express my gratitude to Ms. Sonja Hyrynsalmi, a Post Doctoral Researcher in Software Engineering, who is my second examiner. She understood my interest and suggested an interesting topic that raised my excitement to carry out this study. Her guidance, knowledge-sharing, and advice were tremendous.

Next, I extend my thanks to all the interviewees who shared their experiences in the software industry in a hybrid environment. Their words made a significant impact on the conclusion of this thesis.

I dedicate this master's thesis to my parents and sister in Sri Lanka, who have always supported me in achieving my goals. Finally, I thank my husband, Chinthaka, who always stands with me and provides me with endless support and encouragement to succeed in this thesis.

ABBREVIATIONS

| | |
|---|---|
| COVID-19 | Coronavirus disease 2019 |
| IT | Information Technology |
| SDT | Self-Determination Theory |
| RQ | Research Questions |
| CEO | Chief Executive Officer |
| CIO | Chief Information Officer |
| CTO | Chief Technical Officer |
| ICT | Information and Communication Technology |
| XP | Extreme Programming |
| FDD | Feature-driven development |
| DSDM | Dynamic System Development Method. |
| TDD | Test Driven Development |
| RAD | Rapid Application Development |
| UK | United Kingdom |
| CS | Computer Science. |
| VPN | Virtual Private Network. |
| PI | Program Incremental |

CENTRAL CONCEPTS

| | |
|---|---|
| SCRUM | A collaborative agile framework is widely used in software development teams |
| SCRUM MASTER | A servant leader who ensures the scrum team works well. |
| SCRUM TEAM | A team of self-organized, cross-functional set of people, responsible for delivering functional software. |
| PRODUCT OWNER | One of the agile team members is responsible for ensuring that the team is delivering the maximized value product. |
| PI PLANNING | Program Increment planning. Here, regular sessions will be held to align and agree on next actions by the Agile Release Team |

**Table of contents**

Abstract

Acknowledgement

Abbreviations

Central Concepts

1. Introduction ..... 12
2. Literature Review ..... 15
   2.1. Hybrid Work in the Software Sector ..... 15
   2.2. Agile Methodology ..... 20
   2.3. Scrum Masters ..... 22
   2.4. Self-Determination Theory ..... 24
      2.4.1. Autonomy ..... 25
      2.4.2. Competency ..... 26
      2.4.3. Relatedness ..... 27
3. Research Methodology ..... 29
   3.1. Research Question ..... 29
   3.2. Why Scrum Masters ..... 32
   3.3. Interview Planning & Process ..... 34
   3.4. Demographic Profile ..... 35
   3.5. Audio Transcription Process ..... 35
   3.6. Data Collection & Analysis ..... 36
      3.6.1. Interview Analysis ..... 36
      3.6.2. Transcript Upload & Organizing ..... 41
4. Results ..... 45
   4.1. RQ1: Impact of Hybrid Work on Scrum Master's Autonomy in Work Management. 45
   4.2. RQ 2: Impact of Hybrid Work on Competence Development and Career Advancement ..... 52

4.3. RQ 3: Impact of Hybrid Work on Scrum Master's Sense of Relatedness with Their Teams ..... 59
4.4. RQ 4: Exploring the Strategies to Maintain Collaboration and Connection with the Teams ..... 64
5. Discussion ..... 70
5.1. RQ1**:** Impact of Hybrid Work on Scrum Master's Autonomy in Work Management 70
5.2. RQ 2: Impact of Hybrid Work on Competence Development and Career Advancement ..... 75
5.3. RQ 3: Impact of Hybrid Work on Scrum Master's Sense of Relatedness with Their Teams ..... 80
5.4. RQ 4: Exploring the Strategies to Maintain Collaboration and Connection with the Teams ..... 85
5.5. Limitation ..... 89
5.6. Future Research ..... 90
6. Conclusion ..... 92
7. References ..... 94

Appendices

Appendix 1. Interview questions ..... 1
Appendix 2. Initial codes generated for research question 1 ..... 3
Appendix 3. Final codes generated for research question 1 ..... 4
Appendix 4. Themes generated for research question 1 ..... 6
Appendix 5. Initial codes generated for research question 2 ..... 8
Appendix 6. Final codes generated for research question 2 ..... 9
Appendix 7. Themes generated for research question 2 ..... 11
Appendix 8. Initial codes generated for research question 3 ..... 13
Appendix 9. Final codes generated for research question 3 ..... 14
Appendix 10. Themes generated for research question 3 ..... 15
Appendix 11. Initial codes generated for research question 4 ..... 16

Appendix 12. Final codes generated for research question 4 ..... 17
Appendix 13. Themes generated for research question 4 ..... 18
Appendix 14. AI declaration ..... 19

Figures

Figure 1. Proportionate for employees who wish to work from home (McKinsey Insights, 2021) ..... 19
Figure 2. SDT Motivational model for the workplace (Deci, et al, 2017)..... 25
Figure 3. The thesis timeline..... 34
Figure 4. Data processing flow ..... 36
Figure 5. After uploading the transcript files. ..... 42
Figure 6. File classification..... 43
Figure 7. Result for research question 1 ..... 46
Figure 8. Conceptual framework for the impact of the hybrid environment on autonomy ..... 52
Figure 9. Result for research question 2 ..... 54
Figure 10. Conceptual framework for the impact of the hybrid environment on competency. 59
Figure 11. Result for research question 3 ..... 63
Figure 12. Conceptual framework for the impact of the hybrid environment on relatedness .. 64
Figure 13. Result for research question 4 ..... 68
Figure 14. Conceptual framework for strategies to maintain team connection and collaboration ..... 69

Tables

Table 1. Duration analysis of the interview ..... 36
Table 2. Summary of background information of the participants ..... 38
Table 3. Organization information ..... 41
Table 4. Summary of the codes and references generated for each participant ..... 42
Table 5. Attributes of the participants ..... 43
Table 6. Code distribution and theme generation ..... 44
Table 7. The key findings of the impact of the hybrid work environment on autonomy..... 74
Table 8. The key findings of the impact of the hybrid work environment on competency ..... 79
Table 9. The key findings of the impact of the hybrid work environment on relatedness..... 84
Table 10. The key findings of the strategies to maintain team connection and collaboration. . 88

# 1. Introduction

In the world of software today, many organizations are moving from working at the office to a mix of office and remote work, which is considered a hybrid work environment (Santos et al, 2024). This change came mainly after the COVID-19 pandemic. During the pandemic, workers were at home all the time. However, after the end of the pandemic, many companies practiced hybrid working styles (Barath, Schmidt, 2022) . This lets more companies not just be limited to employees near them, but they open their doors to more talented employees from all over the world. The mix of remote and office work brings new opportunities and problems. Apart from that, it will also include employee satisfaction and motivation, and their welfare (Dron, et al, 2024).

This, in turn, affects the opportunities for individuals working in the software industry to build experience and enhance their careers. Whereas hybrid work redefined traditional workplace settings, it also redefined access to resources, potential for redefined interactions, and opportunities for informal networking (Santos et al, 2024). The active Scrum Master who has taken part in the software industry has played an influential role in the evolution of this software environment (Shastri, et al, 2021). However, the hybrid model becomes a challenge for employees in the software industry because of self-organizing teams, personal responsibilities, and unconscious biases, such as personal judgment (Prenner, et al, 2021).

> ***"Leadership is about making others better as a result of your presence and making sure that impact lasts in your absence."***
>
> — Sheryl Sandberg, *Lean In: Women, Work, and the Will to Lead* (Sheryl, Scovell, 2015).

The quote links the aspect of hybrid work environment autonomy in the software sector to an individual's perception of being in control, especially among Scrum Masters, with respect to structuring their work or making decisions regarding task management in a manner congruent with their personal values and professional goals.

> **"*First and foremost, I believe in flexible working. It is important that employers appreciate their employees' work-life balance and give them the flexibility to work around their personal lives.*"**
>
> — Sir Richard Branson (Stoyanchev, 2023).

These words emphasize that, in a company or an organization, the first and most important aspect is flexible work, and also each organization is required to appreciate its employees, which will motivate them to work in that organization. Moving forward, the employees must do their work while balancing their personal lives. For that reason, organizations should support by providing flexibility.

The present study finds how hybrid work affects the experiences of Scrum Masters in the software industry, focusing on key areas such as motivation, job satisfaction, career growth, and well-being. In this study, the Self-Determination Theory (SDT) was used because, in a hybrid environment, it has changed the way that Scrum Masters learn, interact, and improve within the team and organization when compared to working entirely in the office (Hayata, Han, 2011). Therefore, the Self-Determination Theory (SDT) guides our understanding of how these changes impact motivation and satisfaction.

The theory of Self-Determination thus provides a useful lens through which to understand the influence of hybrid working on Scrum Masters' experiences in software development by investigating the satisfaction of three native psychological needs: autonomy, competence, and relatedness. The main reason for considering the Scrum Master in this study is that the Scrum Master is supposed to play the central role of Agile because of the responsibilities he/she hold in Agile (Noli, et al, 2019). Under SDT, when these three psychological needs are met, individuals are most likely to be naturally motivated, strong, and satisfied in their work (Deci, et al, 2017). A flexible hybrid structure may facilitate autonomy by enabling people to better manage the demands of their personal and professional lives; however, it may concurrently challenge relatedness, as the switch to a hybrid working environment decreases casual interactions that contribute to professional relationships and visibility (Zomer, 2023).

This study examines the impact of specific motivating factors in a hybrid environment on individuals' motivation, skill development, career growth, and relationships within this environment. In other words, it aims to determine whether hybrid work can variably impact these related needs for Scrum Masters and whether it potentially generates opportunities for them to thrive professionally. The insights gained from such studies could provide evidence on how a hybrid work environment is either supportive of or a barrier to professional development, particularly focusing on how such outcomes vary in terms of satisfaction of core needs postulated by Self-Determination Theory (SDT).

The findings from this study will also be useful in drawing implications for organizations in the software sector when formulating policies on hybrid work to address these unique challenges. It would be easier for organizations to create an enabling environment by understanding and responding to particular needs. This, in turn, would likely be reflected in career advancement paths in a broader sense, such as in a more inclusive industry culture that promotes diverse opinions and talent principles, which are more crucial to the sustainable growth of a fast-moving digital world.

Finally, this research aims to identify gaps between previous studies and the current study on how hybrid work will impact autonomy, competency, and relatedness in a hybrid working environment. As this research mainly focuses on the Scrum Master's viewpoint, the gaps may exist because Scrum Masters are not project managers, and they are considered as helpers for both the Scrum team and the organization (Schwaber, Sutherland, 2020). Therefore, this research will provide a detailed and particular understanding of how hybrid work influences their autonomy, competencies, and relatedness.

# 2. Literature Review

In this study, the literature review summarizes and critically analyzes the existing work. It is meant to understand the state of research, identify gaps to avoid duplication, and frame new research within the context of prior knowledge (Knopf, 2006). The context of this literature review in this study was to demonstrate the relevance and necessity of the latest research. It also provided an overview of unfamiliar areas such as SDT.

## 2.1. Hybrid Work in the Software Sector

The COVID-19 pandemic drastically changed the work style of the software industry. Here, the conventional office environment was taken away, and everybody used to work from home. The offices that were once used to be filled became largely empty as employees tried to adapt to working from home (Yang, et al, 2023). However, most companies have been practicing a hybrid work culture since the world's environment shifted to the post-pandemic era. This has been balanced through employees juggling time between remote and on-site work (Kemell, Saarikallio, 2023).

The hybrid way of working has become popular currently, especially in the software sector (Khanna, et al, 2024). As many as 66% of companies worldwide have successfully integrated one type of flexible work model into their organizational structure, and this approach appears to be leading the way in the Asia Pacific. (Smart Office, 2024) However, in Europe, 37% of professionals work in a hybrid environment (Smart Office, 2024). While a significant group of people working in IT and software jobs were already working from home at least part of the time, most wished to split their time between home and the office to collaborate effectively.

The evolution of a hybrid working environment in the software sector, from the traditional working environment, is a contribution of individual, team, and organizational factors (Santos et al, 2024). During the pandemic, it was identified that software tasks could also be effectively performed outside traditional office settings. Because of the work-life balance, reduced

commuting, and the ability to manage personal responsibilities, employees tried to demand hybrid or remote work (Neumann, et al, 2022). Furthermore, many high-profile professionals resist coming to full-time work in the office, and hence, companies have no other choice but to shift to hybrid work environments. Due to the pandemic, many employees changed their geographical location. Due to the same reason, software companies got the opportunity to acquire talented employees from different geographical locations. Therefore, this hybrid model was found to be easier to integrate within the work culture compared to industries traditionally reliant on physical presence (Nolan, et al, 2021).

This transition took several structural changes to accommodate the hybrid work model. Regarding the various needs of employees and the nature of their work, companies had to adopt different hybrid working steps. (Santos et al, 2024). Santos and the team's case study involved 722 participants, out of whom 545 were software professionals. Based on the hybrid working structures below, the identified percentage for each structure where the software companies were practicing. The company in this case study had software development activities across 50 different software teams.

1. Remote-First

This was a model in which most of the time was spent remotely working. This, therefore, allows employees to work from home most of the time, and they can occasionally come to the office, typically to attend meetings or team-building activities. (Santos et al, 2024)This system has worked quite well in focused tasks because the professionals avoided distractions that are common in the office environment. According to the interview carried out by Santos and the team, it is identified that 44% belong to this setup.

2. Office-Remote Mix

It mainly applies to employees who share their time between working in the office and working from home. In most cases, they visit the office once or twice a week. This is a proper balance between being in the office quite often and enjoying flexibility at home. Office days are used for brainstorming sessions or project reviews that benefit from personal interaction. Based on the research, the percentage is 11%.

3. Office-First

Office attendance was preferred since it requires regular physical presence for certain positions, such as project managers, Scrum Masters, and quality assurance personnel. For the most part, workers had to be in the office with some flexibility for an occasional "off-site" day, typically on specific days when working from home was allowed. This arrangement has better supervision and quicker resolution of collaborative tasks. 10% of the individuals in the interview belong to this setup.

4. Full Remote

Here, employees work full-time from home. The model is suitable for activities that require minimal interaction. Project management and communication can be conducted by using digital platforms. It provides maximum flexibility, allowing employees to work from different locations, sometimes even across regions or countries. Here, based on the research of the team, it is 33%

In the software sector, the office remote mix is more important than the rest of the models. It holds great significance in the software sector because it balances the flexibility of remote work with the advantages of in-person collaboration, meeting the key needs of software development teams. It enables collaborative problem-solving. Software development includes not only brainstorming and discussion on design but also problem-solving complex technical issues. The in-office days allow creativity in problem-solving, and the team can work out any issues more effectively since ideas can flow freely and their refinement is done collaboratively. (Santos et al, 2024)

One other factor is strengthening team dynamics. Regular face-to-face interactions build better interpersonal relationships among team members, improving trust and collaboration in agile software development practices where teamwork plays a major role. It also supports agile methodologies. (Oshri, et al, 2007). When it comes to Agile practices, such as daily stand-ups, retrospective meetings, and sprint planning, they work more effectively if all team members are physically present at the same time. Of course, digital tools help in facilitating remote collaboration, such as video calls, but physical presence may make such sessions more interactive and effective (Oshri, et al, 2007).

Generally, developers and testers are productive with deep-focused tasks in office work conditions, while project managers and/or Scrum Master leads can ensure oversight and coordination of activities effectively, which is more suited to remote (Santos et al, 2024). The hybrid model provides an alignment between individual productivity and team needs through four principles by Lynda Gratton (Gratton, 2021). Moreover, a hybrid environment provides efficiency in project review (Yilmaz, et al, 2021). Software projects require periodic reviews concerning code quality, system architecture, and functionality (De Silva, et al, 2023). However, In-person meetings help all stakeholders take up and resolve issues much faster, thereby better aligning with project goals and priorities. (Yilmaz, et al, 2021)

Many software projects, especially those with financial or health applications, require special consideration under security or compliance regulations (Manock, 2025). In-office days make it safer to access resources or environments that a project might not have wanted to expose remotely (Elahidoost, et al, 2024). This is mainly because these compliance-related facts are not accessible outside the office network. It may be hosted by a third-party company or accessed via that company's external VPN. New hires and junior team members benefit from face-to-face mentoring and training. Office days provide opportunities to learn directly from experienced colleagues, enhance skill development, and quickly they will integrate into the company's environment (Elahidoost, et al, 2024).

This hybrid work culture is not limited to one country, but rather to the entire world. Because the COVID-19 pandemic affected the whole world. Therefore, the whole world had to face the post-pandemic environment. The survey conducted on 'What employees are saying about the future of remote work' (McKinsey Insights, 2021).

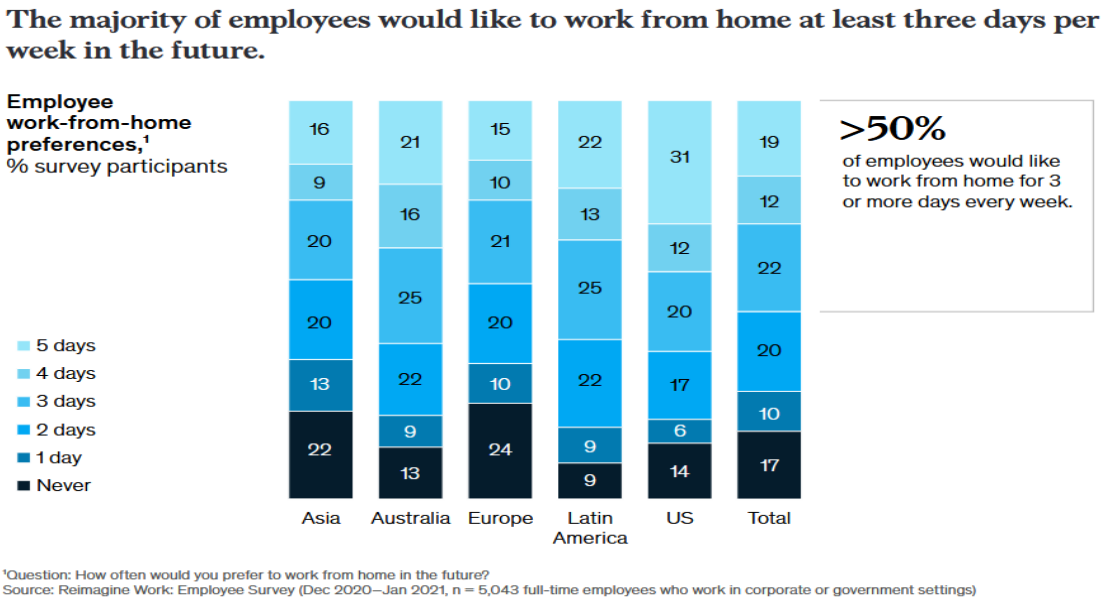


Figure 1. Proportionate for employees who wish to work from home *(McKinsey Insights, 2021)*

According to this survey, more than 50% of people would like to work remotely for at least 3 days. However, this is not 100%, and it means that there are employees who, being fully remote, do not find the work successful, and people would like to have changes in their lives without being at home every day (Santos,Ralph, 2022).

Khanna and the team conducted another survey to assess software companies' responses to hybrid working. In terms of the individual level, it is found that the majority find the working hybrid mode as positive, which is under five codes (Better work life balance, geographical and time ease, comfortable, productivity and efficiency, and ease of online meetings), from 30 responses, whereas 3 codes (lack of job satisfaction, less productivity and more pressure) provided their responses negatively. The majority who provided positive responses emphasized work-life balance mainly. On the other hand, with respect to negative cases, the majority highlighted job satisfaction. (Khanna, et al, 2024)

In the same research, at the team level, seven codes (productivity and efficiency, reliance on online tools, ease of online meetings, geographical and time convenience, comfortable work environment, better work-life balance, and ease of remote work) were identified as positive. Out

of that, productivity and efficiency were the highest. However, in this scenario, fewer points were allocated to work-life balance and ease of remote work. On the other hand, six codes were identified as negative, and they also prioritize productivity as their top priority. It is noted that, at the team level, productivity has both positive and negative effects. (Khanna, et al, 2024)

## 2.2. Agile Methodology

Agile software development is a solution to the problems brought about by traditional and heavyweight development methodologies because it is a lightweight approach (Chen, et al, 2007). It focuses on flexibility, adaptability to changing requirements, and continuous collaboration among stakeholders. Guided by four core values such as "i*ndividuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and responding to change over following a plan*" (Beck, et al, 2001) .

Individuals and interactions mean the aspect of communication and collaboration between the developers, rather than strictly following the formal processes (Chen, et al, 2007). Working software would rather deliver functional software with a minimal amount of time used to create extensive documentation (Gerard, Sietse et al, 2018). Customer collaboration is considered to be more than just contract negotiation, involving continuous customer feedback and participation in understanding and fulfilling customer requirements. Furthermore, even if the development process gets late, responding to change is required rather than just following a plan (Batra, et al, 2017).

Agile emphasizes the ability to incorporate changes in requirements, even those coming pretty late in the cycle of development (Sinha, Das, 2021). Traditional methods like Waterfall follow a linear sequential process in which corrections and changes after the plan has been laid down become very clumsy and highly costly (Andrei, et al, 2019).

Agile practices "just enough" documentation to help communications and progress, often with an emphasis on user stories, sprint backlogs, and collaboration tools. Heavy documentation is expected in every stage under traditional methods, and that could kill agility. (Ly, et al., 2025).

Moreover, Agile works when small, autonomous, cross-functional teams work together collaboratively, emphasizing shared leadership. Traditional methods are typically implemented in large, functionally segmented teams, often employing a top-down management approach. This might kill innovation and responsiveness in return (Ly, et al., 2025).

Agile emphasizes the continuous delivery of incremental value to the customer through feedback loops that ensure alignment with user needs is realized. On the contrary, in the case of a traditional approach, much upfront planning together with milestone-based delivery risks long-term misalignment (Al-Saqqa, et al, 2020).

Besides, Scrum, Feature-Driven Development (FDD), Extreme Programming (XP), and the Dynamic System Development Method (DSDM) are some of the popular agile methodologies.

Scrum is considered as an agile framework used for managing complex projects within specific teams. Work is structured in cycles of work, generally a maximum of 4 weeks, where a particular goal is pursued during this period and kept in mind (Schwaber, Sutherland, 2020). Daily stand-ups, also known as daily scrums, are held where progress is assessed and obstacles are brought forth. (Kenneth, 2013) Additionally, after every sprint, a sprint review is conducted to complete the work, followed by a sprint retrospective that reflects on the process with an eye toward improvement. (Kenneth, 2013). Product owner, Scrum Master, and developer are the main roles of this framework (Kenneth, 2013).

Kent Beck, in 1999, introduced Extreme Programming (XP). It focuses on customer satisfaction, software quality, and adaptability to changing requirements through shorter iterative development cycles (Beck, 1999). The best fit for XP is object-oriented projects with a team of programmers at the same location. XP integrates well-known software engineering practices to an "extreme" level, improving continuous feedback, productivity, and quality, as well as communication and collaboration, iterative development, Test-Driven Development (TDD), and refactoring. It has roles such as programmer, customer, tester, tracker, coacher, consultant, and manager. (Beck, 1999)

Feature-driven development (FDD) is a lightweight, iterative Agile methodology that stresses delivering high-quality software in short incremental cycles, introduced in 1997 by Jeff De

Luca. FDD is a practical and adaptable approach, particularly for large-scale projects where traditional development methods often struggle to deliver on time. (Chai, et al., 2023)

Finally, dynamic system development methods (DSDM) emphasize RAD and iterative, incremental processes. It was initially introduced in 1995 by practitioners in the UK, and it has provided an effective solution (Stapleton, 1999).

## 2.3. Scrum Masters

The Scrum Master today is a critical player in the field of software development, particularly for those companies practicing Agile (Noli, et al, 2019). Though it is considered one of the most misunderstood roles within the Scrum framework, a Scrum Master has important roles in teamwork and adherence to Scrum while facilitating the success of the Scrum Team (Heath, 2021). Scrum Master's responsibility, scope, and impacts within the software industry, especially concerning the Scrum Master being positioned as a servant-leader (Schwaber, Sutherland, 2020).

According to the Scrum Guide, it is the responsibility of the Scrum Master to establish Scrum within the teams as well as the organization (Schwaber, Sutherland, 2020). Mainly, the Scrum Masters should champion the Scrum framework; this means ensuring it is both applied and understood within the team (Shastri, et al, 2021). This guide supports the team in better understanding and applying Scrum practices. This includes coaching the team on Scrum values and ensuring that Scrum events, such as sprint planning, reviews, and retrospectives, are done correctly and time-boxed (Shastri, et al, 2021).

Scrum Masters ensure the transparency of Scrum artifacts and processes for building trust and openness within the team (Shastri, et al, 2021). This would also involve discussing impediments to progress and guiding a team toward self-management and cross-functionality (Schwaber, Sutherland, 2020).

The Scrum Master is a coach for the development team and the Product Owner (Ereiz, 2019). They should be coached on appropriate product backlog management, the usage of prioritization

techniques, and how to increase productivity (Ereiz, 2019). Outside of the team, the Scrum Master helps the organization implement large-scale agile (Shastri, et al, 2021). This would include advising on organizational behavior in line with Agile values, so that stakeholders can interact appropriately with the Scrum Team. Further, when Scrum Masters are working from home, they have to take additional responsibilities to maintain team cohesion and project momentum (Cucolaş, Russo, 2023).

The best description for the role of the Scrum Master would be a servant-leader (Schwaber, Sutherland, 2020). In contrast to traditional managerial positions, they do not impose their authority upon the team and command tasks; for example, they do not dominate the team. Instead, their presence enables the team to develop the ability to accomplish such tasks themselves. Providing self-management ability and support of decision-making processes by the team allows for collaboration and accountability under the Scrum Master's guide (Shastri, et al, 2021). This unique position allows the Scrum Master to facilitate necessary help rather than direct implementation. For example, they do not provide instructions on how to technically develop the product, but instead coach on managing the product backlog, as these are issues to be addressed by the developers and the Product Owner. They advise on process improvements and ensure that the team's efforts are entirely aligned with Scrum principles (Heath, 2021).

While the scope of a Scrum Master is pretty broad, there are distinct boundaries in their responsibilities. They would not be involved in direct product development, people management, or product ownership. (Noli, et al, 2019) This would ensure that the developers maintain self-management and accountability, while the Product Owner retains authority over backlog prioritization. The Scrum Master's concern remains focused on the process, rather than the product or personnel. (Noli, et al, 2019) One of the big challenges faced by Scrum Masters is ambiguity about their role. Sometimes, due to the lack of direct authority, their contributions can be limited. Effective Scrum Masters focus on the concrete benefits they provide, such as improved team dynamics, faster impediment resolution, and increased productivity (Shastri, et al, 2021).

Situations like having to play dual roles-for example, developer and Scrum Master, need to strike a balance (Noli, et al, 2019). Although such arrangements are not restricted, associated

risks include a conflict of interest or the splitting of attention that accompanies such roles. Thus, every organization should make available as many dedicated Scrum Masters as possible (Shastri, et al, 2021). Collaboration, adaptability, and continuous improvement that he brings to a team's approach help them deliver high-value products that meet stakeholders' needs. (Shastri, et al, 2021) Besides that, Agile practices that these personnel often advocate usually provide much-needed organizational transformation through increased efficiency and innovation across all departments (Shastri, et al, 2021).

The Scrum Master is considered the key role in terms of team consistency and efficiency in a dynamic software development environment, especially in team cohesion and efficiency, depending on how well the Scrum guidelines are implemented. (Shastri, et al, 2021) Their unique combination of a servant-leadership role lets them lead teams without undermining the autonomy of their members; this way, creativity and productivity can flourish. As organizations continue to embrace Agile methodologies, competent and dedicated Scrum Masters will be increasingly important in the software industry. (Shastri, et al, 2021).

## 2.4. Self-Determination Theory

This theory is a psychological way of motivation, development, well-being, and human behavior. Edward L. Deci and Richard M. Ryan founded the theory, and it has been refined over the last few decades (Gagné, 2014). It focuses on explaining what motivates people to act. Further, it explores how the different types of motivation influence the performance and behavior of individuals. According to SDT, people naturally possess a set of psychological needs that are critical for growth and well-being (Filomena, 2023). Therefore, as this theory offers a comprehensive and empirically grounded approach to gaining a better understanding of human motivation and psychological well-being, it provides more effective results for a changing working environment, such as a hybrid working environment (Deci, et al, 2017).

SDT in the workplace focuses on motivation as crucial for both employees' well-being and performance (Deci, et al, 2017). It differentiates autonomous motivation, where employees work because the work activity itself is meaningful or pleasant for them, from controlled motivation,

where employees work because of external pressures or rewards (Gagné, 2014). SDT argues that the psychological needs of employees, regarding competence, autonomy, and relatedness, should be elicited to develop autonomous motivation, which will enhance work outcomes like job satisfaction and better performance, along with reduced burnout (Deci, et al, 2017). These needs are supported within organizations, especially by autonomy-supportive leadership, which, in turn, results in more motivated, productive, and satisfied workers. (Deci, et al, 2017)

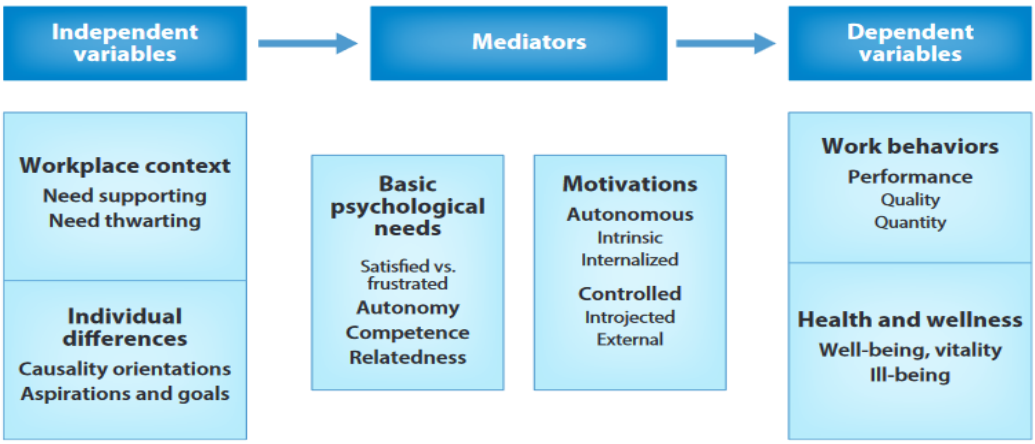


Figure 2. SDT Motivational model for the workplace *(Deci, et al, 2017)*

### 2.4.1. Autonomy

In SDT, autonomy concerns experiencing the action that initiated by him or herself; that is, without controlling by external factors, voluntary accepting and behaving with his or her values and interests (Wu, et al, 2024). It's having that sense that your actions are truly your own, even if you're working towards the goals set by someone else, so long as you agree with those goals and find meaning (Wu, et al, 2024).

It does not mean independence or being left to work in isolation (Gagné, 2014). Rather, it involves being given the choice of how one approaches things and attains a particular goal, maybe with the help of others for a certain piece of work, or even fully independent (Deci, Ryan, 2008). For example, at workplaces, employees feel autonomous when they have a say in how they do their jobs, understand the purpose of their work, and feel their input is valued. Autonomy promotes motivation, accountability, enhances job satisfaction, and improves welfare and

responsibility (Cucolaş, Russo, 2023). When it comes to decision making, it is not just about individual control, but shared understanding will boost autonomy through clarity, not just freedom (Wu, et al, 2024). Further, this autonomy will not be created within an environment in one day, but the stability of autonomy will be gained over a period of time (McAnally, Hagger, 2024).

Workers will be intrinsically motivated if the job environment can provide them with autonomy support, such as letting them take control of the approach toward their tasks or explaining the value of what they do (Gagné, 2014). Where there is autonomy, one can expect to find greater job satisfaction, lower burnout, and overall better performance. The theory, therefore, suggests that managers should create a supportive environment that encourages choice and initiative in ways that foster improved long-term health and productivity outcomes for employees, in addition to better motivation (Deci, et al, 2017). Additionally, when employees have sufficient autonomy, it is easy for them to plan, schedule, and prioritize the tasks (Morgeson, Humphrey, 2006).

### 2.4.2. Competency

According to SDT, competencies are identified as the extent of effectiveness and mastery expressed by an individual within the realm of a specific job (Deci, Edward, 2001). An indication of a person's proficiency in meeting demands, solving problems, and making correct decisions while working. SDT proposes that when employees feel competent, they are motivated and show it in the discharge of duties within organizations and life generally (Deci, Ryan, 2008). Therefore, the organization needs to establish conditions that favor the feeling of competence among human resources through necessary training, challenging opportunities, and helpful feedback. It is further extended to include competition in autonomous and collaborative work, hence integral to the success of individuals and organizations alike (Deci, et al, 2017).

That is, it is the belief that one can effectively carry out their job, develop their skills, and easily manage to complete a task. A person is competent when they receive helpful feedback and are given a chance to develop and see the outcome of hard work. Competence makes the employee

motivated and participatory (Gagné, 2014). Workers, when they believe they are capable of competence and skill, will be more productive and creative, and will become attached to the assigned tasks. An organization can support competence by ensuring that any feedback given is clear, positive, and constructive, hence enabling employees to understand how well they are doing and in which areas they can improve. Accordingly, challenging yet feasible tasks provide stimulation for learning and developing skills (Gagné, 2014). However, for office days, it is required to implement best management practices to enhance the competency (Brunelle, 2021).

### 2.4.3. Relatedness

According to SDT, relatedness, along with autonomy and competence, is one of the three important psychological needs (Gagné, 2014). Relatedness can be considered as a feeling of connection with others, typically described as a sense of belonging and meaningful and supportive relationships. It is critical to motivation and well-being at work (Wehmeyer, et al, 2017).

The relatedness also supported the managerial aspects of the organization. Managers who acknowledge employees' perspectives and let them foster a respectful, inclusive atmosphere help satisfy the need for relatedness (Wehmeyer, et al, 2017). The propensity for relatedness improves in those work cultures that advocate collaboration and mutual help among colleagues. Regular positive feedback and open communication strengthen relationships and a sense of belonging. Thus, SDT does not neglect social connections at work. The fulfillment of this need will evoke much greater motivation and better performance, along with improved well-being among the workers (Wehmeyer, et al, 2017).

This is particularly important in an organization because employees who are connected with their coworkers will start to work effectively with them. It provides the base for trust and teamwork, which again is very crucial to achieving shared objectives (Wehmeyer, et al, 2017). When employees find out the feeling of relatedness, they value it, which enhances their engagement to the work and the organization. Supportive relationships buffer the effects of stress. In workplaces where relatedness is fostered, employees are much practice to deal with

difficulties and sustain personal well-being. The feeling of belonging is higher, and the tendency for turnover is lower since employees are less likely to leave an environment where they feel a sense of connection and acceptance (Gagné, 2014).

The relatedness also supported the managerial aspect of the organization. Managers who acknowledge employee perspectives and foster a respectful, inclusive atmosphere help in satisfying the need for relatedness. Relatedness is enhanced in work cultures that encourage collaboration and mutual support among colleagues (Gagné, 2014). Regular positive feedback and open communication strengthen a sense of connection and belonging. Hence, SDT emphasizes the importance of connections with others in the office environment. When this need is satisfied, employees will experience increased motivation, improved performance, and enhanced well-being. (Wehmeyer, et al, 2017).

# 3. Research Methodology

This research is conducted using qualitative methods. The primary reason for using this approach is to explore the impact of hybrid work in the software sector, with a focus on the experiences of individuals who live and work in this environment. A qualitative approach delves deeply into the insights gained from people's experiences, thoughts, and motivations within their specific social and work settings, which are non-numeric (Oranga, Matere, 2023). It aims to explore how hybrid working influences autonomy, competence, and relatedness among Scrum Masters in the workplace.

Qualitative research would, therefore, be ideal for this kind of study, as it examines complex issues that are context-dependent (Laurie, et al, 2011). It highlights, through personal stories, certain challenges and opportunities faced by Scrum Masters in hybrid work setups that might not have been visible with numbers alone. SDT describes what motivates people and involves their psychological needs. Qualitative approaches help elicit the sort of depth and detail relevant to that theory as they describe how the workplace system and social relationships support or limit the needs (McAnally, Hagger, 2024).

## 3.1. Research Question

Qualitative research questions serve as the starting points for an investigation of a topic in depth. These research questions (RQ) are to assist the researcher in understanding how and why people think, feel, or behave in particular ways in specific situations. They do not seek a "yes" or "no" answer; instead, they invite exploration and discovery. Good qualitative research questions can provide a proper guide to the study (Agee, 2009-07). The study examines the impact of hybrid work on Scrum Masters in the software industry, necessitating an understanding of the complex experiences and perspectives involved.

The study was initiated by identifying my interest in understanding the impact of hybrid working on Scrum Masters, in view of the social and cultural setting that characterizes a software

development environment. An explanation was attempted to be given regarding how hybrid working combines with the factors of autonomy, competence, and relatedness, which are considered the prime ingredients of SDT.

Then, it started with broad questions related to how hybrid work influences everyday working life and career development. The questions are designed to explore and frame my study, refining its direction. In the light of SDT, I framed my questions in terms of autonomy, competence, and relatedness. The theory has helped narrow down how these basic psychological needs are satisfied or challenged in hybrid work environments.

I divided my main questions into sub-questions to ensure depth and detail of the objective of the question. For example, investigate strategies that keep the connection and collaboration alive in hybrid teams. I also reflected on how my questions might influence participants, and how to show sensitivity and conduct ethical research. It is through this iterative and reflective process that focused and meaningful research questions were developed to guide qualitative inquiry.

**RQ 1: How does the hybrid work influence the autonomy of Scrum Masters in managing their work?**

In any given job, satisfaction and productivity partly depend on the ability to manage the work independently and make decisions on one's own. Research how workload management, decision-making, and work-life balance in a hybrid work model empower or cause problems for Scrum Masters.

This is important to understand, as hybrid work is increasingly a feature of the software industry and influences approaches to jobs and responsibilities. Findings from this study can help organizations support Scrum Masters by meeting their needs for autonomy in a hybrid work environment.

Furthermore, the Scrum Master must identify how this autonomy will contribute to achieving a better work-life balance, along with the workload they are carrying out. Findings can help Scrum Masters achieve a better work-life balance. Additionally, it is important to consider to what extent the Scrum Master can make decisions independently while working. This makes it understandable why hybrid work favors independence in decision-making.

**RQ 2: What are the perceived impacts of hybrid work on the competence and career development opportunities for Scrum Masters in the software sector?**

The research question of competence examines how hybrid work affects or influences one's ability to perform the Scrum Master role effectively, as well as the opportunities for growth in this profession. It would be highly relevant to learn from Scrum Masters' perspectives on self-efficacy, specifically their perceived capacity for accomplishing tasks and projects, whether concerning skills or resources that can enhance their performance in a hybrid job environment. Hybrid remote work has changed how everyone learns and develops professionally.

It seeks to determine whether this working style creates more or fewer career development opportunities within the software industry by examining those changes. This section explores the lived experience of Scrum Masters, focusing on the challenges they face in absorbing new skills or developing in their careers. Practical examples from their experiences will help give a deeper insight into hybrid work. This, therefore, will elaborate on how hybrid work influences professional effectiveness and development, underlining whether it supports or hinders the growth of Scrum Masters in the software industry.

**RQ 3: How does the hybrid work affect the relatedness of the Scrum Master with their teams?**

Relationships play a critical role in effective collaboration in a work environment. However, in hybrid work, the team members may work from both their homes and offices. For this reason, it might be hard to maintain professional connections while meeting team goals, ensuring that all individuals feel included and aligned. Since Scrum Masters are the pivots through which guidance and support are provided to their teams, it is essential to understand how they maintain these connections.

**RQ 4: What strategies do Scrum Masters use to maintain collaboration and a sense of connection?**

This research focuses on relatedness to explore how hybrid work affects teamwork, team consistency, and communication. The study also examines the strategies exercised by Scrum Masters to ensure that cooperation among team members is encouraged. The findings will be

presented as recommendations for good practice in managing hybrid teams, ensuring that sound professional relations, considered a core component of success in the software sector, are maintained.

## 3.2. Why Scrum Masters

The research involves a total of 10 Scrum Masters who work in hybrid environments and practice agile methodologies. Participants include both male and female Scrum Masters. The primary reason for using Scrum Masters in this research is that, in agile teams, the central role is typically considered to be that of Scrum Master. Such Scrum Masters are important in Agile frameworks, mainly in facilitating all Scrum ceremonies, team collaboration, and they ensure that the team follows the principles set forth by Agile (Noli, et al, 2019). They would develop extensive knowledge of team interaction and organizational structure, making them well-placed to provide valuable perception into how hybrid work influences teamwork, communication, and autonomy.

The number of Scrum Masters was determined based on research conducted by Guest and the team. According to the study, it is identified that to get the accurate number of themes, it is best to have 6-12 participants (Guest, et al, 2006). Therefore, I considered only 10 participants in this research.

The next reason is that the Scrum Masters have good insight into the organizational culture and dynamics within a team. They have firsthand experience with regard to maintaining health in a team, effective communication, and conflict resolution. Their experiences offer valuable insights into how hybrid work environments impact collaboration, communication, and overall employee morale, which are essential components of relatedness and competence derived from Self-Determination Theory (SDT).

Given the nature of the Agile framework, most Scrum Masters have experienced hybrid work arrangements in their roles, which involve facilitating virtual and in-person collaboration (Dron et al, 2024). That makes them valuable participants who are capable of providing specific insights into the challenges and opportunities that hybrid work brings forth, especially for

women in leadership or management positions. They balance the dynamics of remote and in-person work, so their points will be very timely.

The Scrum Master is well-positioned to foster an environment in which team members can thrive, ensuring that autonomy and competence are realized within the team (Heath, 2021). With hybrid working, therefore, the development of well-being, productivity, and motivation becomes the responsibility of team members, clearly falling into the psychological needs described within SDT. In this position, they hold a unique advantage in observing and potentially influencing how hybrid work may impact these needs, particularly those related to relatedness.

In this research, I have considered both female and male Scrum Masters in hybrid work who experience autonomy, competence, and relatedness. It would therefore avoid all kinds of biases and ensure findings that are more generalizable to a greater population of Scrum Masters in the software industry. With the participation of both males and females, the diversity of perspectives will widen, enriching the data and yielding a high level of insight into hybrid work.

Furthermore, I have invited not only those with fewer years of experience as Scrum Masters but also more years of experience as Scrum Masters. Therefore, in this study, the participants varied in experience from 1 to 10+ years in the Scrum Master role. Additionally, I have invited a diverse range of other experiences/job roles previously other than Scrum Master role. It is because, before they became Scrum Masters, they had experience in the environment as team members or cross-functional employees. Then their response will be spread across a wide range.

Finding appropriate Scrum Masters was quite challenging, especially within Finland. I consider only Scrum Masters within or working in Finland because, to maintain cultural and environmental stability, including any political and regional differences that may exist, they need to remain consistent. I did not consider their nationality as they are working according to Finnish culture.  I found these participants by inviting them to the discussion on LinkedIn, and the rest through their own networks.

## 3.3. Interview Planning & Process

The interviews were planned to be conducted as a 40-minute discussion via Microsoft Teams, and all the interviewees were aware that the discussion was being recorded in advance. Based on the convenience of participants, the discussions were organized. The discussions were planned to be in English. The first interview was conducted in the second week of February, and all the interviews were completed by the first week of March 2025.

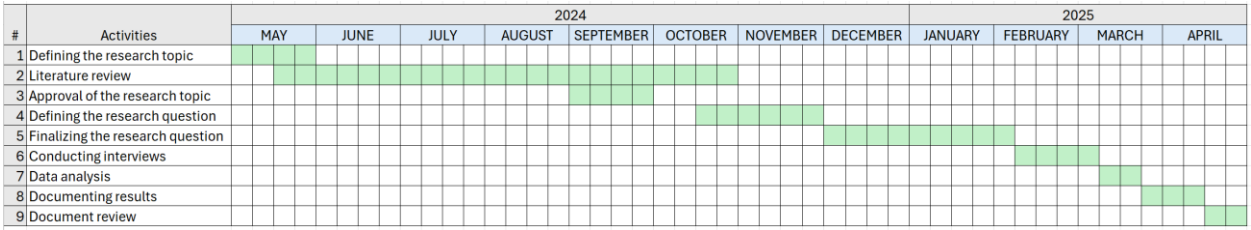


Figure 3. The thesis timeline

The interview is designed with open-ended questions. Open-ended questions have been used in this research because respondents have the freedom to convert their views, feelings, and experiences in to their own words in a deeper manner rather than just "yes," "no," or specific options in closed questions.

In this study, the flexibility to explore diverging perspectives should be allowed. The investigation will, therefore, focus on the experiences and perceptions of Scrum Masters, which may differ significantly due to personal, organizational, and cultural variables in hybrid environments. Thus, these semi-structured questions will enrich exploration.

These research questions were formatted into parts so that they covered the objective of the research. (*Appendix 1*). It started with general questions that covered the professional background of the interviewees. This is because some Scrum Masters may not have been engaged in the software sector early in their careers or may have received education in fields other than IT or CS. Then it is followed by their working environment. These two sections brought the interviewee into their comfort zone.

Next, the main objective was covered. First, a brief introduction about autonomy, competence, and relatedness to the interviewees. Then, for each sector, a couple of questions were raised where the interviewees exposed his/her experiences, which is really important for this research.

## 3.4. Demographic Profile

The interviewee's privacy and confidentiality were protected and maintained by not disclosing the participant's information such as the names and organizations. They all remain anonymous. This is mainly to protect their privacy and confidentiality. Before starting the interview, the interviewee was informed of the anonymous nature of the interview. This puts the interviewee in a better position to provide more in-depth responses without fear of judgment, professional harassment, or misuse of information. Anonymity refers to ethical research practices and guidelines. It helps establish trust between the interviewer and interviewee.

## 3.5. Audio Transcription Process

Microsoft Teams includes a transcription facility that converts spoken dialogue during meetings to written text. This advance makes meetings far more accessible and provides a record of the discussion. Since these interviews were done in English, the transcript is available through a live recording. This live transcription immediately gives a written record of the conversation, therefore allowing one to focus on the discussion without the distraction of taking detailed notes. It will be an immediate transcription that gives more accuracy to the researcher because this captures exactly word for word what these participants are answering, which proves very helpful during qualitative analysis. Instant transcription speeds up data analysis efficiently and swiftly to the identification of themes and insights. Generally, live transcription supports the improvement of research workflow and builds confidence in the results of findings. These transcripts are fed into NVivo, which generates the codes appropriately, followed by the identification of themes.

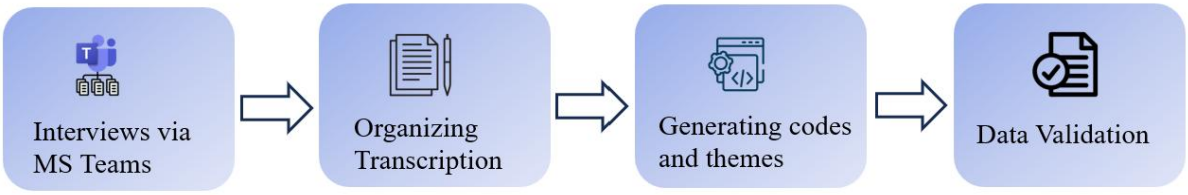


Figure 4. Data processing flow

Even though the plan was to complete the interviews by the first week of March 2025, due to the unavailability of time from Scrum Masters, the interviews were extended until the end of March 2025. However, the initial interview started as planned. Each of the participants faced for same interview questions and separately provided a brief introduction of what is meant by STD so that the answers will be provided to the point and without repetition. No interview questions were provided in advance.

## 3.6. Data Collection & Analysis

According to the research approach, interviews were conducted at appropriate time intervals, and all data were collected. All interviews were conducted via MS Teams, recorded, and transcripts were generated.

### 3.6.1. Interview Analysis

Initially, the interview was planned to be approximately 30 minutes. However, some participants took more than planned as well, while some to less time than planned. Table 1 depicts the duration of each respondent.

Table 1. Duration analysis of the interview

| Respondent | Date | Interview Duration (minutes) |
|---|---|---|
| 1 | 28.01.2025 | 36.45 |
| 2 | 13.02.2025 | 21.46 |
| 3 | 17.02.2025 | 31.14 |

| | | |
|---|---|---|
| 4 | 06.03.2025 | 29.45 |
| 5 | 19.03.2025 | 22.10 |
| 6 | 22.03.2025 | 48.46 |
| 7 | 24.03.2025 | 29.14 |
| 8 | 24.03.2025 | 28.19 |
| 9 | 24.03.2025 | 26.10 |
| 10 | 25.03.2025 | 25.54 |

To identify the different aspects of males and females and avoid gender bias, the interview was conducted with both male and female Scrum Masters. Furthermore, it is necessary to determine their educational background because some participants may have initially pursued education in one domain but later transitioned their career into the software sector. Additionally, some participants initially involved in software development later transitioned to management.

Interview participants of this research, none of whom started their career as Scrum Masters. They have been working in different professions. Furthermore, some individuals have been working in the software industry from the beginning, while others entered the field later. It is also identified that their experiences as Scrum Masters also vary. Additionally, some are working in an agile environment quite a lot of the time.

One of the most important things to identify is the number of teams they are handling as Scrum Masters. It is because, if they are acting as a Scrum Master for multiple teams, it can be an identity with which they can work autonomously. Also, to what extent do they feel competent, and how are they making a professional connection with those teams. Furthermore, the team size is also considered, which may have an impact on relatedness. Additionally, it is checking about teams' hybrid work arrangement, especially if the Scrum Master is working with multiple teams, whether all teams are in the office same day or the arrangement varies for teams, and also it can be identified whether teams adhere to organizational hybrid work policy, or they have their own arrangements.

The table depicts a summary of the above information.

Table 2. Summary of background information of the participants

| Participant No | Male / Female | Educational Background | Reason for being a Scrum Master | Previous designations | Number of years in the Software Industry | Number of years as Scrum Masters | Number of years worked in an Agile environment | Number of teams handling | Teams size | Teams' hybrid arrangement (per week) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Male | Technical Business Management and specialized in Marketing | Not a special reason. Interested in Scrum Master. | Test Manager Project Manager | 10 | 10 | 15 | 2 | Team 1: 10 Team 2: 10 | Vary for each team |
| 2 | Male | at a commercial college in public administration | Manager insists on becoming a Scrum Master | Developer and many more | 32 | 2 | 2 | 2 | Team 1: 9 Team 2: 6 | No specific day to come to the office |
| 3 | Male | Master's in business technology | Top management insists on becoming a Scrum Master | QA Engineer Trainee | 19 | 10 | 16 | 2 | Team 1: 10 Team 2: 10 | Two days' work in the office |
| 4 | Male | Bachelor's in computer science and currently studying a Master's in software product | To gain experience in different aspects of the software industry | Software engineer | 6 | 1 | 6 | 3 | Team 1: 11 Team 2: 7 Team 3: 4 | All team members have to come same day |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | management and business | | | | | | | | |
| 5 | Female | Bachelor's in early childhood, Master's, and PhD in educational sciences | As it is related to human psychology, and is unable to find a job outside the tech industry | Scrum Master | 5 | 5 | 5 | 2 | Team 1: 6<br>Team 2: 12 | One day in the office |
| 6 | Female | Bachelor’s in business administration and majoring in human resources, and currently studying a Master’s in software product management and business | Make it beneficial for the studies. | Consulting Career tech recruiter | 10 | 2.5 | 10 | 2 | Team 1: 4<br>Team 2: 19 | No specific day to come to the office except for PI planning |
| 7 | Female | High school mathematics and programming Bachelor's in software and systems engineering. | Preferred methodologies and interested in organizing things | None | 1 | 1 | 1 | 1 | Team 1: 7 | One or two days in the office |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Female | Master's in business administration. Major in human resources. | A Scrum Master vacancy exists in the company | Freelancer tester<br>Web developer<br>Software engineer | 10 | 3 | 6 | 2 | Team 1: 12<br>Team 2: 16 | Two days, but if required, three days, and it is different for each team |
| 9 | Female | Master's of engineering | Headhunted and received an opportunity to become a Scrum Master | QA engineer<br>Product Manager | 25 | 4 | 6 | 2 | Team 1: 10<br>Team 2: 10 | Two days in the office, but it is not mandatory |
| 10 | Female | Bachelor's in software and systems engineering. Currently studying cloud and network infrastructures | Due to the Scrum Master training provided by the university | Software developer | 1 | 3 months | 1 | 1 | Team 1: 8 | Been in the office for specific needs |

Hybrid work is something very attractive to organizations. However, this was started to practice so widely after the COVID pandemic. In this research, it is to identify how many years they have been practicing and familiar with the hybrid working environment. Also, it is trying to identify what is the provided hybrid policy for each of their organizations. This is important because it will help to identify whether employees are adhering to policy and also to check whether, even though they have a hybrid policy, it is strict or not. However, based on the responses, it seems that they are not strict on time because most of them are not aware of the policy provided by the organization. Table 3 provides information on when the organization began practicing a hybrid environment and details its hybrid working policy.

Table 3. Organization information

| Respondent | When the organization starts a hybrid environment | The hybrid policy of the organization |
|---|---|---|
| 1 | Before COVID | Not aware of the company's hybrid policy |
| 2 | Before COVID | One or two days at the office |
| 3 | After COVID | Two or three days at the office |
| 4 | After COVID | Minimum 2 days at the office. |
| 5 | After COVID | One day at the office. But varies for different departments. |
| 6 | After COVID | No specific hybrid policy |
| 7 | After COVID | No specific hybrid policy, as it is a startup company |
| 8 | After COVID | Two days at the office |
| 9 | After COVID | Not aware of the company's hybrid policy |
| 10 | After COVID | Not aware of the company's hybrid policy |

### 3.6.2. Transcript Upload & Organizing

After the interviewee's background has been analyzed, started with the content analysis starts. For that, first, all the respective files were uploaded to the NVIVO application. These files were truncated as explained in the previous section, as many misleading and not understandable words exist in the generated transcript. Further, uploaded file names also remain anonymous to maintain the anonymity of the interview participants.

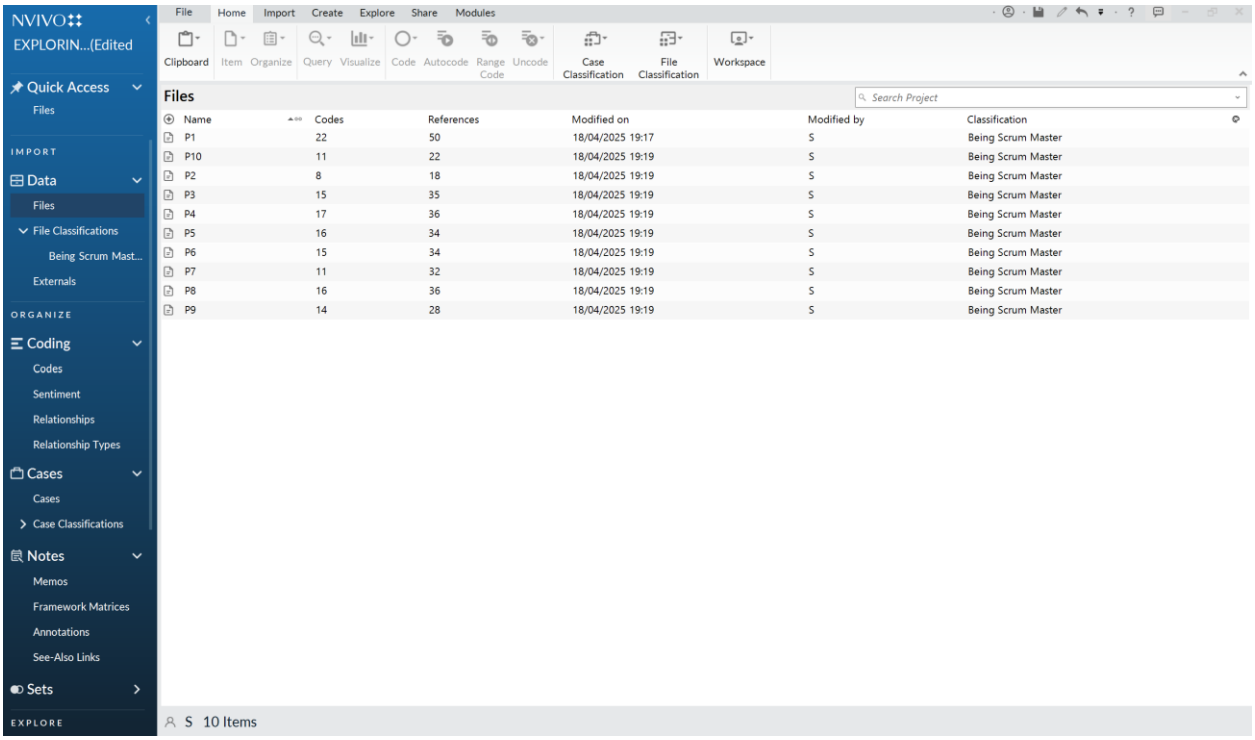


Figure 5. After uploading the transcript files.

After the files were uploaded, a file classification called ‘Scrum Master’ was created. For that case, appropriate attributes were generated. These attributes were generated based on the analysis of the interview data from the previous section.

Table 4. Summary of the codes and references generated for each participant

| # | Participant | Number of codes generated | Number of references |
|---|---|---|---|
| 1 | P1 | 58 | 162 |
| 2 | P2 | 32 | 60 |
| 3 | P3 | 52 | 130 |
| 4 | P4 | 42 | 84 |
| 5 | P5 | 54 | 135 |
| 6 | P6 | 48 | 139 |
| 7 | P7 | 42 | 110 |
| 8 | P8 | 42 | 93 |
| 9 | P9 | 52 | 128 |
| 10 | P10 | 31 | 63 |

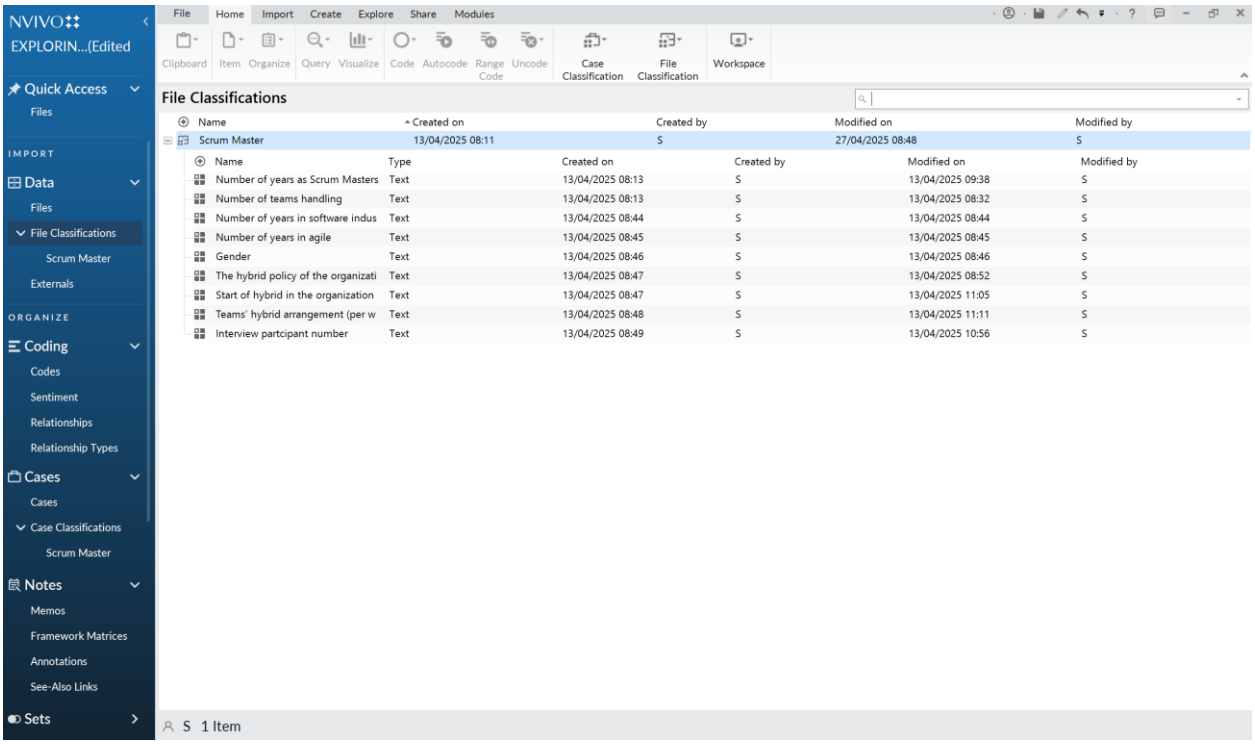


Figure 6. File classification

According to the above attributes, the values below were set.

Table 5. Attributes of the participants

| # | Attribute Name | Description | Attribute Values |
|---|---|---|---|
| 1 | Interview Participant Number | Participant's unique identification | 1 to 10 |
| 3 | Gender | Gender of the participant | • Male.<br>• Female |
| 2 | Number of Years in the Software Industry | How many years that the participant been engaged in the software industry | • 1 to 10<br>• 10+ |
| 4 | Number of Years in Agile | How many years that the participant been engaged in the agile | • 1 to 10<br>• 10+ |
| 5 | Number of Years as Scrum Master | Number of years that the participant has acted as a Scrum Master | • 1 to 10<br>• 10+ |
| 6 | Number of Teams Handling | The number of teams that the participant is currently handling | • 1 to 10 |
| 5 | Hybrid Policy of the Organization | Whether a specific hybrid policy exists in the organization | • Have a specific policy<br>• No specific policy<br>• Not aware of the policy |

| | | | |
|---|---|---|---|
| 6 | Start of Hybrid in the Organization | Checking whether the organization starts practicing hybrid from the beginning or after COVID | • Before COVID<br>• After COVID |
| 8 | Teams' Hybrid Arrangement (per week) | In each week, what is the team's hybrid practice | • One day at the office<br>• Two days at the office<br>• Occasionally at the office<br>• One or two days at the office<br>• No specific day to come to the office |

For each research question, I initially created appropriate codes based on the research papers I have reviewed so far. However, through further analysis, new codes were identified later on. The table below displays the number of initial codes and, following analysis, the number of codes identified, along with their respective appendices.

Table 6. Code distribution and theme generation

| # | Research Question | Number of codes | | | | No of Themes | Appendix Number |
|---|---|---|---|---|---|---|---|
| | | Initial number of codes | Appendix No | Final number of codes | Appendix No | | |
| 1 | RQ 1 | 15 | Appendix 2 | 52 | Appendix 3 | 6 | Appendix 4 |
| 2 | RQ 2 | 15 | Appendix 5 | 48 | Appendix 6 | 5 | Appendix 7 |
| 3 | RQ 3 | 9 | Appendix 8 | 24 | Appendix 9 | 4 | Appendix 10 |
| 4 | RQ 4 | 9 | Appendix 11 | 19 | Appendix 12 | 5 | Appendix 13 |

# 4. Results

After analyzing the above data, the results have been obtained. This result is discussed based on each research question.

## 4.1. RQ1: Impact of Hybrid Work on Scrum Master's Autonomy in Work Management.

**Research Question: How does hybrid work influence the autonomy of Scrum Masters in managing their work?**

As the Scrum Master plays a significant role in an agile environment, in the hybrid environment, do they enjoy autonomy while managing their work? As the answer to these questions, it is identified that most interviewees agreed that autonomy exists. However, some participants did not 100% agree that hybrid work influences the autonomy of Scrum Masters in managing their work. Based on the codes, first-order codes, second-order codes, and overarching dimensions were identified. The result for this question was obtained by the following interview questions.

**a.** As a Scrum Master, does hybrid working influence your capability of managing workload and time while keeping a balance between private and professional life? How?

**b.** Has hybrid work influenced your independence in daily work and while making decisions? If it has so, how?

Figure 7. Result for research question 1

After analyzing the data concerning the research question on the impact of the hybrid working environment on Scrum Masters' autonomy for workload management, it is identified that the majority of Scrum Masters emphasize autonomy in planning and scheduling tasks. For instance, 7 participants agreed on this. As per the P3 participant,

> *'The meeting was planned for the first day. On Monday morning, we can decide if anyone has personal issues, just some agendas, or everyone wants to take leave. So we can always have that kind of planning on Monday morning to make a decision based upon their ability and all.' – P3.*

According to the P3, on the first day of the week, the whole team is aware of who is available and who is not. This allowed the Scrum Master to organize, plan, and schedule work independently. Additionally, according to the P7, when work is done fully or partially remotely, more autonomy exists because Scrum Masters have greater freedom in organizing work.

> '*I think that there is, in hybrid work, in any work that is done partially or fully online, there is a lot more independence that you have to have and that you can have. So, for example, organizing how you want to do your work is a lot easier*.' *– P7.*

Two participants (P4 and P6) highlighted that; hybrid environment provides more autonomy for task prioritization. Most of the Scrum Masters in this research are handling more than one team and more than one project. Therefore, their task allocation is also complicated as there are many team members. However, unlike onsite task prioritization, they believe that the hybrid model offers greater flexibility, as per participant P4.

> *'When you are working in a hybrid model, you have much more time to work on the different projects because you get a lot of time to save' – P4.*

This implies that significantly more autonomy exists when the Scrum Master works on multiple projects, and it facilitates greater flexibility in task prioritization. In other words, it is noted that when they are at home, they have more independence to choose what work they will do within the week.

Additionally, four participants further argued that workload management sometimes depends on various factors in a hybrid environment, which influence autonomy. In that sense, the degree of autonomy in managing the workload varies.

> *'It depends on what aspects of work we are looking at. Because if we are speaking about. A lot of the planning work that sometimes is just more effective when doing it face to face, particularly when you start a new project.' – P1*

Here, P1 explains that, depending on the situation, autonomy is affected by various factors, not just the hybrid environment. For example, in a new project, it is necessary to have more face-to-face meetings with multiple people, which can impact autonomy. However, due to the project's success, these steps need to be taken.

Work-life balance and well-being are two main areas that Scrum Masters mainly focus on. They said that when they could work from home, they would be in a working mindset and would not have to waste their time traveling. Furthermore, they could complete their homework simultaneously. This is much easier for females. P10 said that.

> *'At the end of the day, it balances out, so there are days where it makes life easier and more flexible. But then I think quite often. For me, at least it also comes with flexibility to do some extra work.'-P10*

According to the Scrum Masters, a hybrid working environment is both relaxing and can also be worked in professionally. However, the drawback of these home working days is that there is no clear boundary between work and personal life, and one must switch frequently between professional and personal tasks, especially for women. Irrespective of the country, most of the household work falls on women (Babych, 2021), which means it requires a balance between professional and private life. This affects the autonomy of the person's workload management. P5 explained it in this way.

> *'But I also observe that women have another. Side off coin, which is like. Still, most of the housework falls on women. Doesn't matter which country you are. I said in other cases as well, just working from home makes you sit maybe longer on your computer than you would otherwise, in terms of decisions, the decisions are the same.* -P5

However, P6 argued that such autonomy can be affected if the Scrum Master does not structure their work before going to the office on a given day. For example, if the Scrum Master does not organize their day to go to the office and it will be full of online meetings, they will be more productive working from home. Therefore, in advance, it is advisable to manage and organize the work for the days when it is required to go to the office.

> *'So, for instance, if I have a day full of meetings and calls. It might make sense for me to be at home where I have much better.' – P6*

P9 explained that a hybrid working environment does not affect decision-making. According to her, if the employee is comfortable with both the location at home and the office, it makes no difference at all. If someone is comfortable working from either home or the office, their preference may vary.

> *' Even if you are at the office or home, it does not matter in terms of autonomy in making decisions. But then, this is good for those who are comfortable with home and office work.' – P9*

Another way in which hybrid work influences autonomy for the Scrum Master while managing their work is through the dynamics of communication and interaction. This is mainly an argument that it reduces the autonomy of the Scrum Master. The primary challenge is communication in a hybrid setup. According to P9, hybrid work is considered a form of 'waiting'. With 6 years of experience in an agile environment, P9 believes that

> *'Hybrid work is waiting. Somebody to read your message and answer it.' -P9*

P9 was elaborating on the wording, stating that during hybrid work, if the Scrum Master is working remotely, whenever they send a message to a respective party, the recipient must wait until they see the message. In other words, until the recipient responds, the sender must wait before making a decision. Therefore, the autonomy of the Scrum Master is affected.

Besides the above concern, many participants highlighted that some events, such as PI planning and P2, emphasize that they should either be held online with the entire team or on-site.

*'We had some PI planning online, but then everyone should be either on site or remote because it doesn't work that some people are on site and some people are online.' – P2*

However, he then mentioned that it is much more worthwhile to do them on premises rather than online. He is not encouraging a hybrid environment in this scenario. Additionally, P1 noted that when it comes to making big decisions, face-to-face meetings or onsite availability are crucial for making a complete decision. This means that, for high-level decisions, autonomy is not taken into account. It is a cumulative decision.

*'When it comes to big decisions, and you need to talk face-to-face, that you need in order to make a complicated decision.' – P1.*

P8 has made this comment because, with the team's help, a decision is being made. In other words, it's negatively influencing the autonomy. When making a decision, it is not entirely independent when working with a team and considering their thoughts as well. This is in contrast to previous elaborations, such as autonomy in planning and scheduling.

*'I don't think so much because we are quite transparent with the communications. We follow all the dailies every day, and we are quite active with the teams. '- P8.*

One interesting point is resistance to the loss of autonomy. P6 explained that when people are given hybrid environments, such as spending one or two days at the office and the rest at home, they have full autonomy in doing their work and making decisions while at home. However, when they are accustomed to such an environment, it will be very difficult to ask them to return to the office.

*'People have this kind of feeling that once they have already gained this kind of benefit of being able to work full remote, it's really, really hard to take it away from them.' – P6.*

According to P5, in hybrid environments, it has some time working from home, and it is experiencing that even though the work is completed for the day, if some of the pending work remains, the mind is not getting sufficient power to relax, but starts thinking about the pending work. This is affecting both the autonomy of workload management and the well-being.

> *'I think it is quite similar for everybody that now that we're working at home, it is harder to differentiate between where we also relax is the place where we also work. So, leaving the work thoughts behind is harder.' – P5*

Nevertheless, P7 argued that a hybrid environment encourages autonomy in any decision. For example, as a Scrum Master, he has the freedom to decide whether to have an online or on-location meeting. This is an important aspect in terms of autonomy in decision-making.

> *'But then on the other hand, it was always nice to have the option of meeting in person whenever that was possible. So, I would say that it did help quite a lot in the overall progress of the project.' – P7*

According to P7, when someone is present in person, it is easier to discuss and reach a conclusion on a complex project. However, it is beneficial when it is used to make a stable decision. In autonomy, the influence seems to be less than when working at the office all day and making decisions.

A hybrid environment increases individual control and responsibility, especially when the team works from home, which in turn expands the scope of responsibility and accountability. According to the P4 participant, the team is not always available when working from home. Then the Scrum Master has more responsibility for finding out what they really do and whether they are waiting for the assistant.

> *'I guess exactly when you're working in a hybrid model, you can also look into many more things as compared to working from the office '- P4.*

According to the participant, it affects autonomy both positively and negatively. The positive aspect is that it enhances decision-making power. At the same time, it decreases autonomy by increasing monitoring.

Based on the results obtained from this research, a conceptual framework was developed.

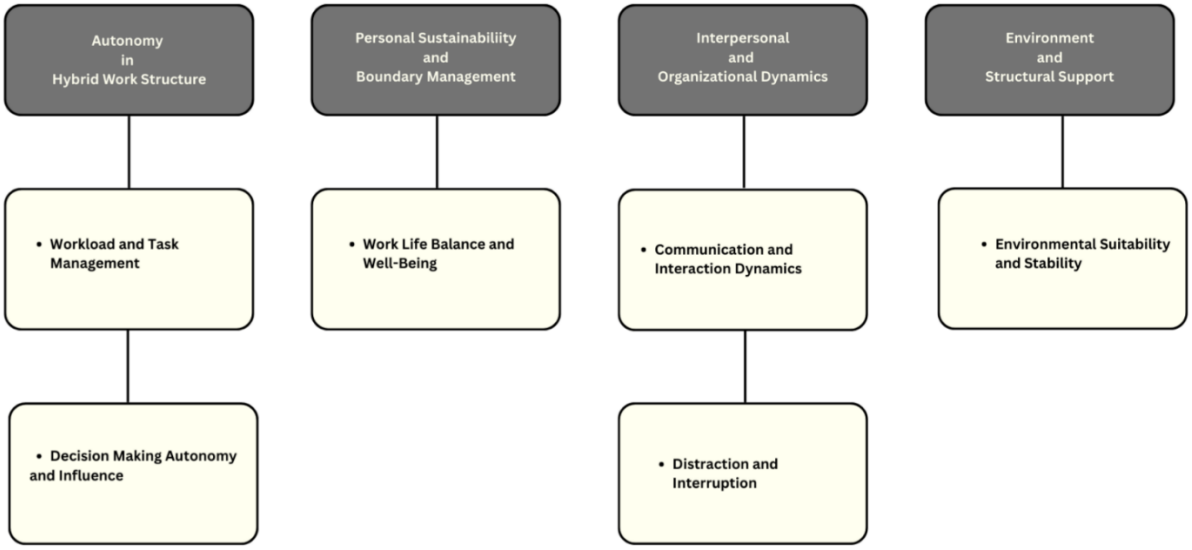


Figure 8. Conceptual framework for the impact of the hybrid environment on autonomy

This conceptual framework focuses on autonomy in a hybrid environment and how the hybrid environment is impacting autonomy in terms of workload management. In other words, this framework presents what autonomy looks like for the Scrum Masters and how autonomy might be influenced in a hybrid work setup. This framework comprises of four main components that address different aspects of how hybrid work impacts their role, specifically in terms of autonomy, including well-being, collaboration, and support.

## 4.2. RQ 2: Impact of Hybrid Work on Competence Development and Career Advancement

**Research Question: What are the perceived impacts of hybrid work on the competence and career development opportunities for Scrum Masters in the software sector?**

Research question 2 aims to investigate how hybrid work for Scrum Masters affects their competencies and career development in the software sector. This question was quite interesting for the participants because, except for the P5 participant, almost all had their first career as something other than a Scrum Master. They have held various job roles. (Table 2). In this

research question, the participants' views had a significant number of codes that spanned different areas. The following interview questions obtained the result for this question.

**a.** As a Scrum Master, how confident do you feel managing tasks and projects in a hybrid work setup? Can you elaborate?

**b.** What skills or resources could improve your effectiveness?

**c.** In your opinion, what is the impact of the hybrid work on learning and growth opportunities for you in the software industry?

**d.** Based on your experiences as a Scrum Master, what are the challenges and opportunities you have experienced in acquiring new skills or advancing your career in hybrid work? If possible, could you share some examples?

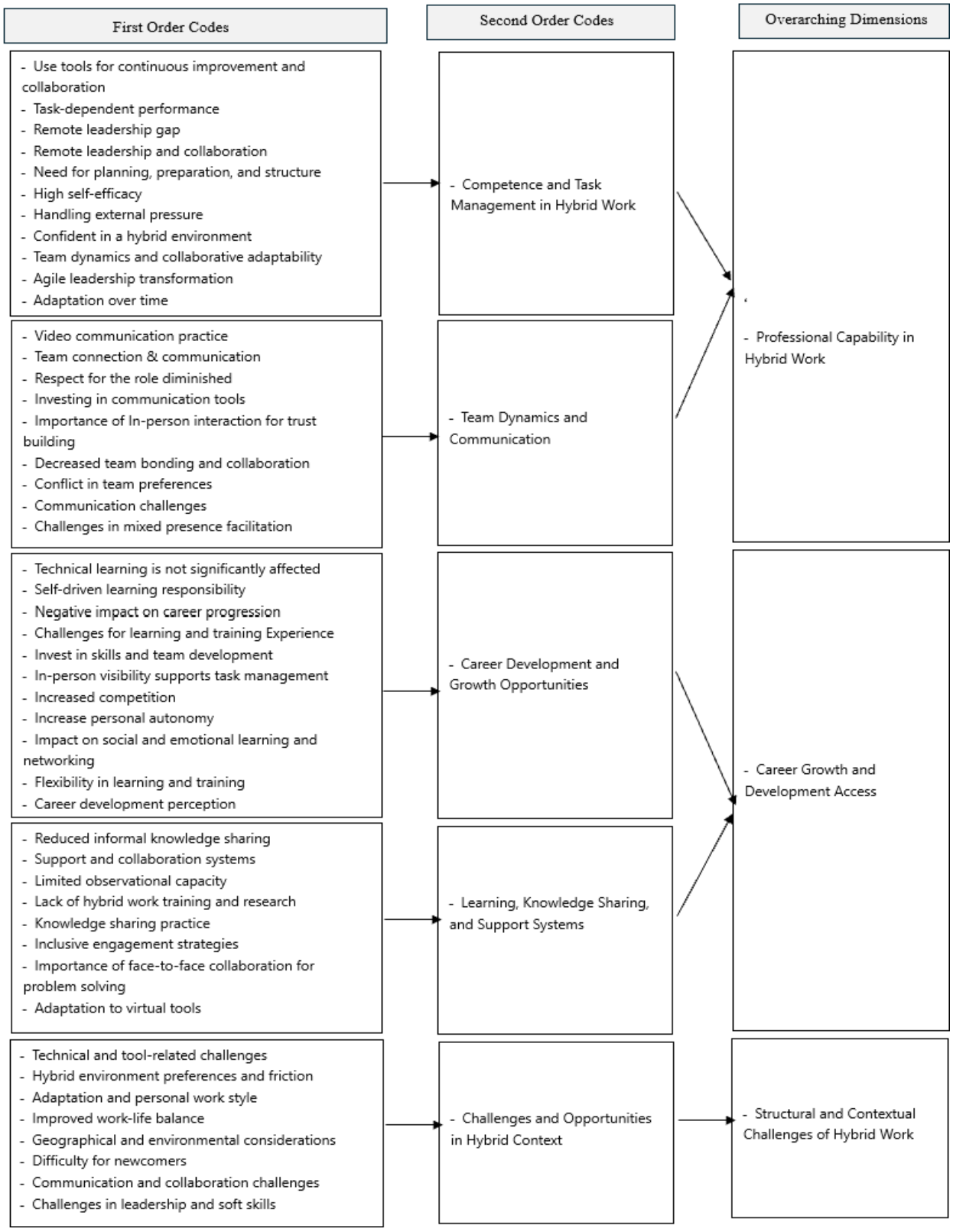


Figure 9. Result for research question 2

Following key aspects are discussed below based on the findings of this study. In terms of competency in a hybrid environment, Scrum Masters have shown a preference for task management. This has arisen due to confidence in working in a hybrid environment. It is believed that tasks that can be performed on-site can also be accomplished in a hybrid environment. This was explained by P2, implying that the appropriate and sufficient tools and techniques were available to perform the duties. This makes him confident in doing their routines and managing their tasks.

> *'I could do anything that I can do on-site' – P2.*

On the other hand, daily stand-ups make the work easier as team members are aware of what is going on within the team. Collaboration and flexibility enhance the confidence of the Scrum Master. P3 further explains this as the flexibility to strike a balance between family and work priorities. Along with a collaborative environment, it leads to confidence in the work.

> *'He can come to the office and we can create a collaborative environment in the team and have metro interaction. So it's really a collaboration of better, the balance between your priorities, family priorities, and work priorities. And you can create a good repo within the team by doing that.' – P3*

Another important aspect that many participants highlighted is the adaptation over time in a hybrid environment. This is especially highlighted by participants who have extensive experience in the hybrid environment, such as P1 and P8. Moreover, P9 explained that when a team member joins the team, training needs to be provided so that they can work with full confidence.

> *'When new people join the team, I need to be cautious for a while, they learn how I treat people and how we talk to each other, so kind of onboarding them into the team, but onboarding them to my style.' – P9*

Furthermore, Scrum Masters emphasize the importance of having a structured preparation. Two participants raised this. Structured preparation is mostly required on days when the Scrum Master is available on-site. This is because most companies require all their team members to

come to the office on specific days. If the Scrum Master is prepared beforehand, no shortcomings will occur, and the work can be done more effectively.

*'Sometimes I feel that I should prepare things and go gradually with the team.' – P9*

While exploring the influence of hybrid work on competencies, the need for team dynamics and communication is identified. In this regard, the majority of the participants had different perspectives. However, it has become a concern that people are not habituated to using video while in a meeting. This may be the reason for being shy or not confident in showing themselves when they are at home. In that scenario, the facilitator may doubt whether the participants are doing what they say behind the camera, which makes them less confident in what they deliver to the participants. Furthermore, this affects the effectiveness of what Scrum Masters intend to accomplish within the project. The more experienced Scrum Masters mostly brought this argument.

*'But when it is hybrid, when people are online, it doesn't go that way. I'll be honest. We drift apart. We do something else on the side. We don't pay attention. So, it really impacts.' –P5*

P4 Scrum Master elaborates on the need for improvement in remote leadership and collaboration. According to her, it's quite challenging because when she works remotely, she sometimes isn't aware of whether she can find the right person online to get things done, as that person isn't physically present with her. According to P4, it is affecting the ability to move forward with the project, and in a hybrid environment, it is necessary to acquire the skill of working independently.

*'I think the one thing which improves a lot is that you learn to work as an independent because it's not always your leads are present physically with you, so you learn to resolve a lot of issues on your own' -P4.*

According to the participants in this research, numerous career development and growth opportunities emerged in a hybrid environment. A significant number of participants discussed that the advantage of in-person visibility supports task management. This is particularly applicable for large organizations, as it enables the Scrum Master to communicate effectively with team members and resolve issues promptly. Further, it is also an advantage for Scrum

ceremonies to be in person. This will increase career growth and enhance the capability to solve complex situations.

> *'If you're in person, it's a lot easier to know where everyone is at, then what stage of work everyone's at when you're in person, and you can just look over and ask someone what's, uh, how they're doing.' – P7*

Another common aspect that emerged in this research is the importance of self-driven learning. In a hybrid environment, a significant amount of online learning materials exists for career growth. Although there are plenty, it is the employee's responsibility to take full advantage of this. In other words, this is purely up to the employee to take advantage of these resources or not. Participant P4 clearly states that.

> *'So, actually, it is solely upon you how much knowledge you are getting through, like online resources' – P4*

Additionally, it is discussed that, in a hybrid environment, Scrum Masters may occasionally need to work from home on certain days. However, it sometimes does not give the same comfort as when you are at the office. You do not have a peer or coworker to turn to for support if needed. However, P7 argues that this is a good opportunity to build confidence and become independent in the workplace, as well as to support career growth.

> *'A lot of the time, if you are working remotely, you don't have the same comfort that being able to look over to your coworker or someone and say Hey, please help me. So you have to be more independent than that, I think that can be a good thing' – P7*

Besides the career development and growth opportunity, learning, knowledge sharing, and support systems provide significant support in a hybrid environment. As a Scrum Master, adapting to virtual tools enables more efficient work. Some Scrum Masters are not familiar with an organization-specific virtual tool. In that situation, they get the opportunity to learn as well. If they were masters in a particular area, they could easily share their knowledge with these virtual tools.

> *'I learned some extra tools. I mean to engage the people. I mean, for example. How can I track the individual or their? I mean work, so in that sense, now we have JIRA metrics there, and we use some inside the tools themselves, at the company level. '– P8*

Finally, the challenges and opportunities in hybrid work are identified. It has already been discussed regarding career growth and development opportunities. Other than that, they were emphasising more on challenges rather than opportunities. The main challenge most of them highlighted is the challenges in distributed teams across countries. This is going to be worse when time zone differences are for like 5 to 6 hours.

> *'Some of the worst challenges are probably time zones. When you are managing projects across time zones. That can be challenging indeed.' -P1*

One more challenge that was highly discussed was the communication and collaboration challenge. According to P3, this challenge depends on honesty and trust. If the person is working from home, there is no way to track what they are really doing, which means that if they are idling, it will affect the team's progress and ultimately impact career improvements as well.

> *'If a person is at home, you never know whether he is working for home or working for the organisation, right? Because you cannot always be there. So that is kind of trust and honesty.' – P3*

According to the participants, work-life balance is considered an opportunity. This is especially important for female Scrum Masters, who often emphasize that they can also manage household work alongside office work, as well as reduce their commute. According to P7, a hybrid working environment makes life comfortable.

> '*So, I think that there's a lot of opportunity in that, that it just makes life a bit more comfortable, I guess. I can use my time for learning or any other work soon after I sign out from work. No time spent on commute.'–P7*

Based on the results of the interview responses, a conceptual framework was developed, incorporating subcategories for each dimension. In this framework, professional capability in hybrid work, access to career growth and development, and structural and contextual challenges are considered as key dimensions.

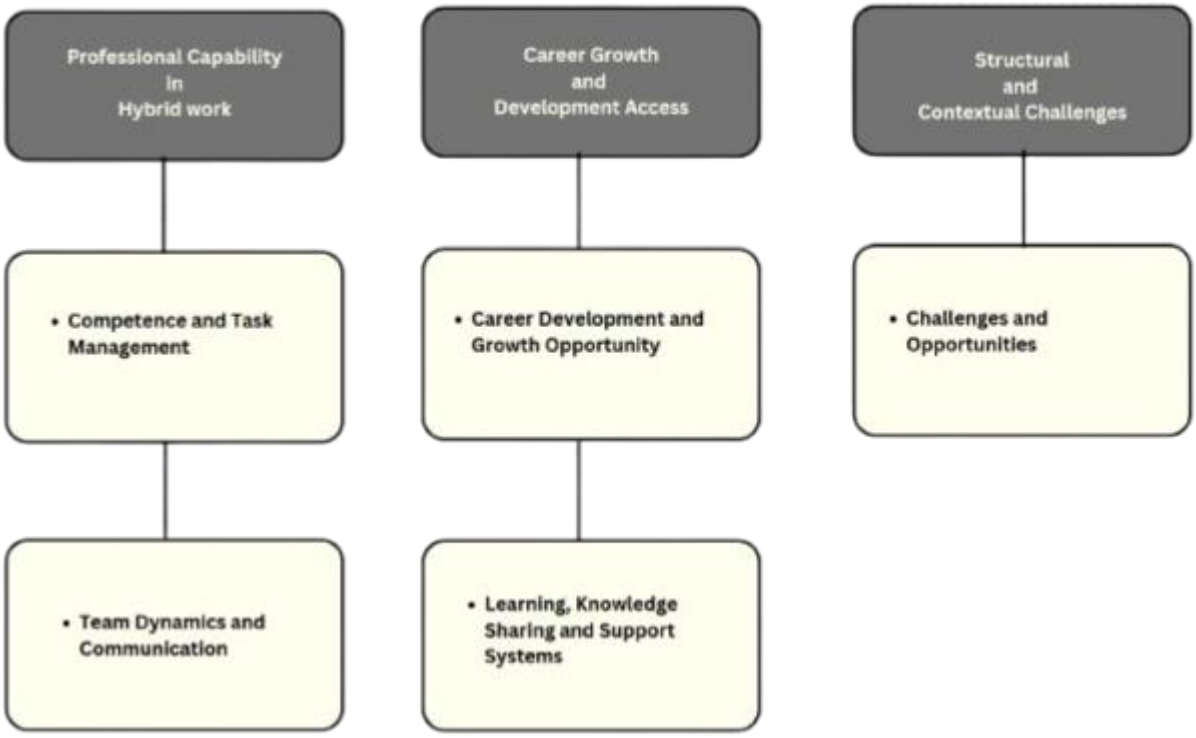


Figure 10. Conceptual framework for the impact of the hybrid environment on competency

This analysis identifies how hybrid work impacts Scrum Masters' ability to perform their roles effectively, including remote communication, utilizing digital tools, facilitating agile ceremonies, managing distributed teams, and maintaining team consistency despite physical separation.

## 4.3. RQ 3: Impact of Hybrid Work on Scrum Master's Sense of Relatedness with Their Teams

**Research Question: How does the hybrid work affect the relatedness of the Scrum Master with their teams?**

In this research question, the primary focus is on exploring how hybrid work will impact Scrum Masters in terms of their relatedness. In hybrid work, team members typically come to the office once or twice a week, or occasionally for special events. In that situation, the research question examines Connection to their team, and exposing examples of their experiences is the objective

of this research question. This is discussed by providing the following question to the participants.

a. According to your experiences as a Scrum Master, how does hybrid work affect your collaboration with your team and your connection to the team's progress?'

Here, too, the codes generated are quite diverse. Participants have different perspectives on these questions. Also, it includes contradictory aspects as well. For example, P1 emphasized that collaboration and connection to the team in a hybrid environment are affected not because of location differences but because of the attitude of the people. He mentioned that people's attitudes can make a significant change in a company. According to him, if they want to work truly, they will do so honestly; otherwise, they will not. Some people, however, do not want to engage in teamwork, which can then affect progress.

> *'It really depends a lot more on the attitude of the people. I think if people are not engaged and if people are not interested and they don't want to work.' – P1*

On the other hand, other participants elaborate on their experiences, stating that relatedness is affected based on the team members' location. If the team member resides or stays nearby, it is easy to meet face-to-face at least and get the work done. This is much easier if the developers are mostly in a nearby location. As a Scrum Master, it is easy for them to explain the context, especially in complex problems.

> *'Well, I think it depends on where the members are based. For example, as I said, the developers were also in the same location, so it was a bit easier for us to connect and talk because we could also meet face to face.' – P10*

Most participants explained the importance of face-to-face communication in team collaboration. It further enhances the team's progress. It is highlighted that for relatedness, trust is essential, and if you find the team members more frequently and being with them, it means it will enhance and build trust, which will be easier during work

> *'I didn't see my closest colleague for, let's say like half a year at first, and it is due to the fact that they live. They live so far away from Helsinki, but I always remember that after the*

*first time when we met and we got to spend some time together and I built that super important trust, it was quite different.' – P6'*

Another significant impact that the participants mostly highlighted is that remote work will limit connections and, hence, affect the team's progress. For example, it is harder to build or maintain strong relational ties, such as with product owners, because they hardly come to the office and mostly will meet in virtual communities. Because of this, even if the team member has a complex situation, they have to wait for some days to rectify.

*'But with the product owner, maybe sometimes it was a bit harder because. We couldn't really meet in person' – P10*

This is not only with the product owner, as the participants explained, but the role of Scrum Masters is also significant when it comes to supporting the team. However, one Scrum Master explained that it was necessary to maintain a balance between providing support and simply offering direction on how to complete the work.

*'It's more delicate. It's something that you'd probably need every now and then, and yet you need to know that when you cannot interfere anymore. So that it's kind of finding the balance where we can do the work together when my help is needed. And when I need to step back and let it be. And of course, in certain cases it also escalates.' – P9*

In addition to the above fact, one Scrum Master explained the need to remove blockers. If any blocker exists, it is the Scrum Master's responsibility to act and remove it. For that, he suggests daily standups providing a good hand.

*I think that the dailies, of course, are the main thing because in those dailies you can discuss what is going on, what needs attention, what, if we have any, like Blockers or issues that should be, and I would. Of course, I would like to hear about those, and I ask, and normally, team members tell me that they have an issue with this and they are stuck, and then they might meet the same difficulties, and the way to help it. It's basically the same. – P2*

Scrum Masters mostly worry about the loss of casual interaction. P1 elaboration is clear that, if a certain person is sitting near you and if an issue arises, it is not necessary to have a separate time for a meeting and discuss that. Still, a casual conversation will lead to the best solution.

> *'Resolve certain issues or have this kind of more casual conversation when you are sitting close to people. Again, this kind of famous conversation over lunch or around a coffee machine. That is definitely something that is missing.' – P1*

One of the important facts the P5 Scrum Master explained is that a hybrid working environment encourages them to communicate with other Scrum Masters in the organization. According to her, there can be organization-level decisions to be made, and for that, having a relationship with other Scrum Masters at any time via an online tool is possible, allowing them to make decisions collaboratively.

> *'But of course it's Scrum Masters must not only work with development teams, but we are also a team within ourselves with other Scrum masters, and you can observe that. We have less of a problem reaching out, so we can collaborate relatively easily. – P5*

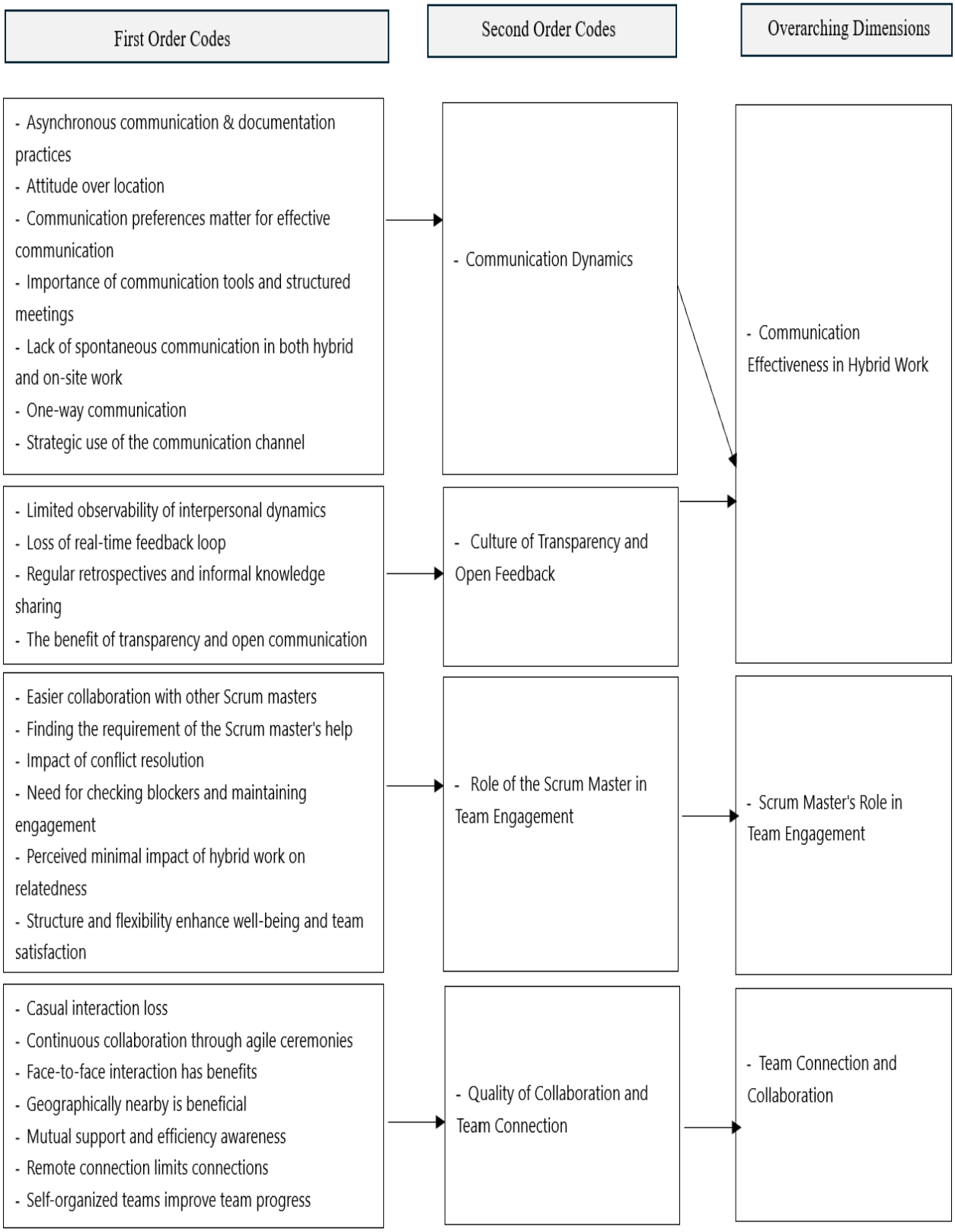


Figure 11. Result for research question 3

According to the results, the conceptual framework that was created is as follows.

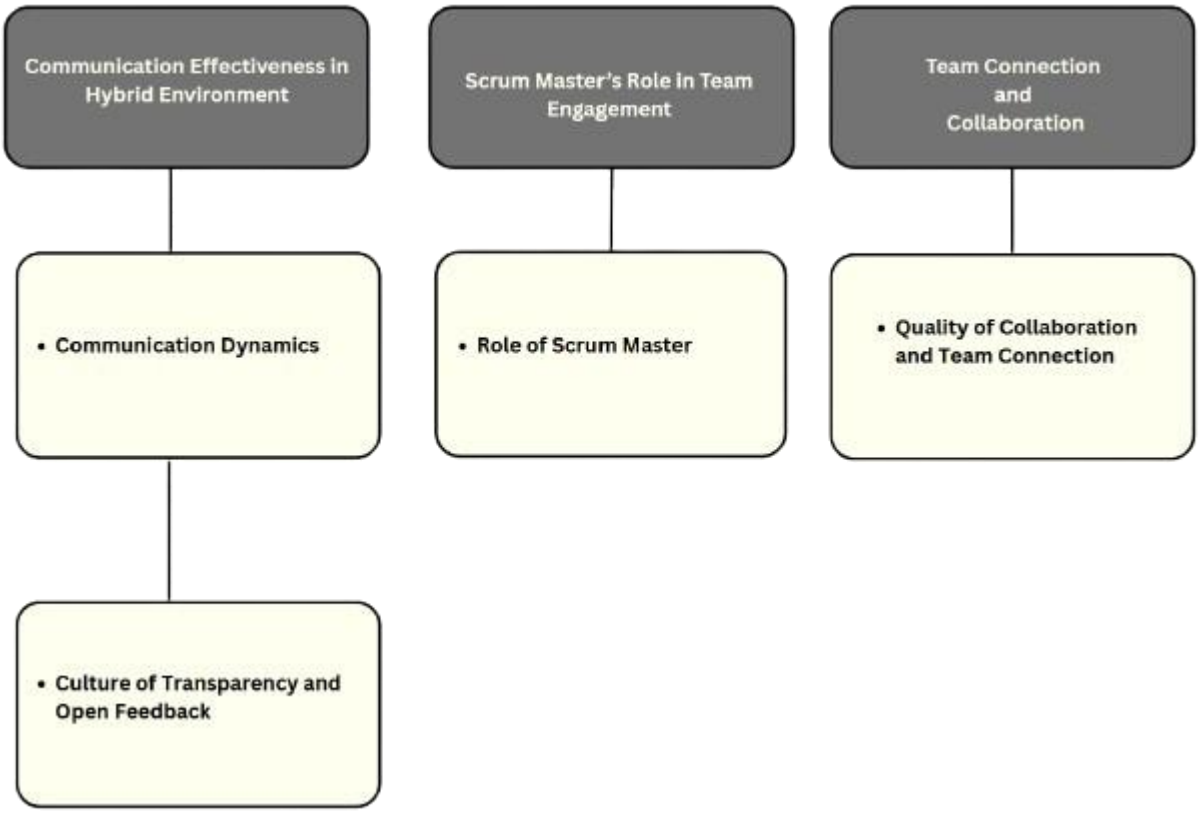


Figure 12. Conceptual framework for the impact of the hybrid environment on relatedness

This framework consists of three dimensions: communication effectiveness in hybrid environments, the Scrum Master's role in team engagement, and team connection and collaboration. Each of these dimensions consists of subcategories that favor these dimensions. These subcategories contain facts that encourage them.

## 4.4. RQ 4: Exploring the Strategies to Maintain Collaboration and Connection with the Teams

**Research Question: What strategies do they use to maintain collaboration and a sense of connection?**

In this final research question, the aim is to determine how Scrum Masters maintain collaboration with team members in hybrid work environments, as well as the methods used to maintain connections with team members. This has become quite an interesting topic for participants to discuss. For this research question, the interview question is discussed as follows.

a. In hybrid work, how do you establish and maintain professional relationships with your team members? Any strategies you work on? Can you share some examples?

Regarding the research question, the generated codes were a smaller number compared to other research questions. However, most participants practice similar strategies for collaboration and connection within the team. For example, most of them value personal conversations beyond work.

> *'It's usually the people that you work closely with where you start to get to know each other a little bit and make sense as well to maybe talk about things other than work' – P1*

As the P1 participant who has had a significant number of experiences in the software industry, he elaborates on this strategy because he believes that conversations outside of work will make the person more comfortable talking with others, and hence it will be beneficial for work too. However, he highlights that this is only applicable for the closed colleagues, and it will take some time to build that closeness with others.

Another important strategy that most participants discussed is holding regular video calls.

> *'So, actually, what we do is like at the end of every month the last Friday, we have an online chit chat meeting. So what the guys do like everyone brings something to eat in the meeting, and we have like all the cameras on meeting.' – P4*

The P4 participant was excited about this strategy because, in a hybrid environment, not everyone may be coming to the office at the same time. In that situation, a specific time is allocated for a virtual meeting so that they can see each other via video. This helps bring all team members together at one table and facilitates relaxed conversations.

Another important aspect of maintaining team collaboration is conducting team-building activities. It is not necessary to participate in physical activity, but it can be performed virtually.

P1 participant provided practical experience related to this. According to his experience, his team included members from different countries, including his own. Therefore, the culture-related differences can be identified from these activities, such as cooking recipes from various countries etc.

> *'Organising some remote activities like remote cooking clubs, meaning that we have been sharing recipes, and then. Everybody has been cooking recipes from another country and then we kind of compared our results or we have been. Picture taking competitions and these kinds of things.' – P1*

The P6 participant highlighted the importance of setting mutual expectations in the early stages. As she said, when the new team member is onboard, they will provide a full, detailed explanation of the requirements expected from the team, both individually and organization-wide. This will create a mutual agreement, making it easy and beneficial for maintaining team bonding.

> *'When I'm hiring these people, I will already try to set expectations in a sense that I will, of course, in addition to trying to ensure that they know. What kind of company and role they are joining, I also like that I get to hear their expectations. I think that's super important because then when the people join me, we already have a mutual agreement on that, but I also do have team members whom I call every week. '– P6*

She also emphasizes that face-to-face interaction in the initial stage builds the foundation of the relationship between them. The reason she prefers the onboarding process to be practiced face-to-face is that the new person will also be comfortable with the rest of the team members. For example, having lunch together is suggested as a good practice.

> *So at the beginning, when the person joins me, I will always try to ensure that I offer them lunch. I think it's a nice practice, but then I have personally liked good experiences of, like, building, building a good foundation for the joint venture with the person*.' *– P6*

Participants in this research discussed the barriers to adhering to these strategies. One is the instability of project teams. As a P1 participant with a significant number of years of experience, he mentioned that many team members have changed over time. In that situation, it isn't easy to

maintain the relationship. If team members are changing frequently, he has to repeat the same exercise to explain how work is done within the team and the organization. Furthermore, he mentioned that if a stable team exists, it is easier for him to maintain relationships with the team.

> *'If you have a stable team, the challenge sometimes in the project world is that people come and go, and that it sometimes just is. Short-term arrangements in a way' – P1*

Another barrier discussed in these interviews was the extra effort required for the online connections. According to him, most companies do not provide a home internet connection, and when the team works from home, a video call is often required, which in turn requires more bandwidth, thereby arising as an issue. It will affect the communication.

> *'If you want to build personal connections online, it really requires an extra effort. Like, I don't just really reach out to people and have this kind of personal conversations or video calls. Or, in a group setting, coming up with ways to do something as a team remotely. We are still doing a lot. Most of our calls are not done this video. It's also a bandwidth issue. Company will not provide internet for home.' – P1*

Therefore, in this research question, both strategies used to maintain the relationship with the team were discussed, as well as all barriers that affect these strategies.

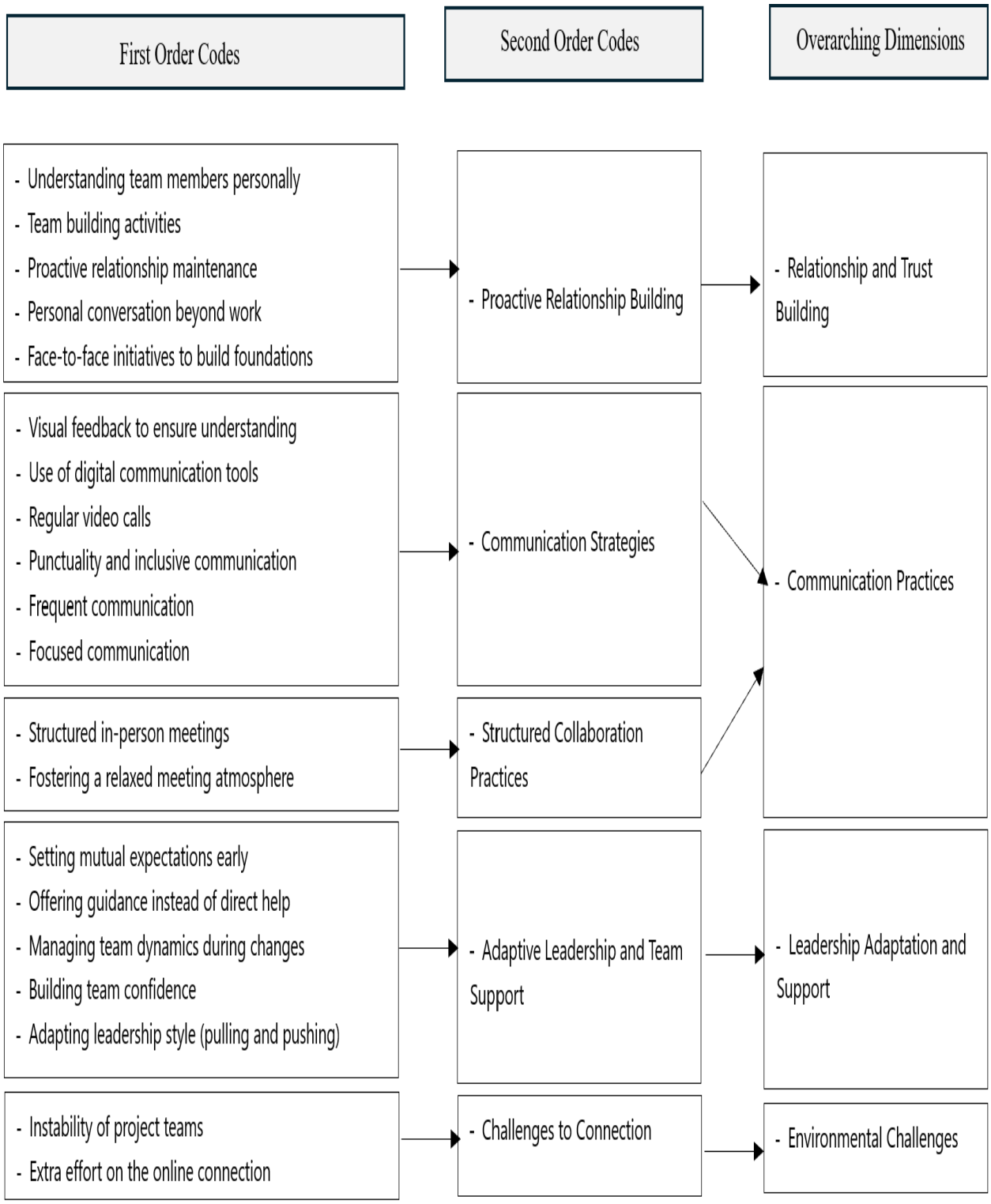


Figure 13. Result for research question 4

Based on the identified dimensions, the created conceptual framework is as follows. Relationship and trust building, communication practices, leadership adaptation and support, and environmental challenges were identified as dimensions.

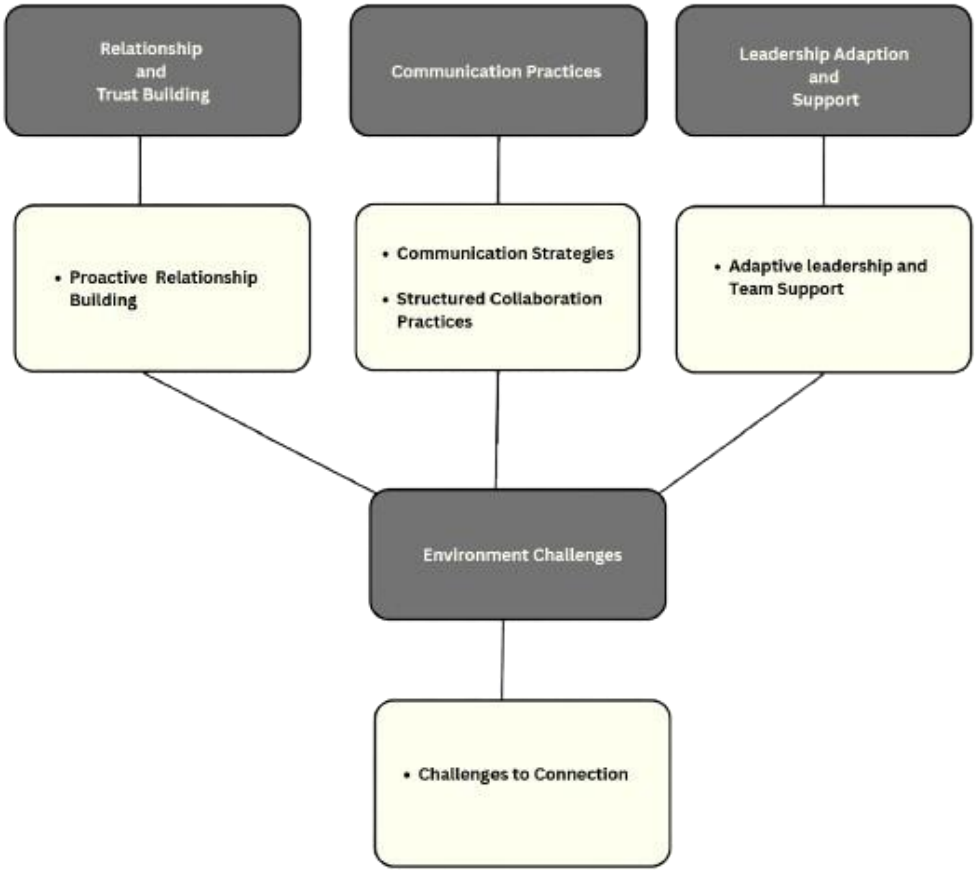


Figure 14. Conceptual framework for strategies to maintain team connection and collaboration

However, it is noted here that the relationships between dimensions, trust building, leadership adaptation, and support have been impacted by environmental challenges.

# 5. Discussion

In this section, the results of each research question are discussed. Furthermore, the background of the participants is considered, as presented in Chapter 4.

## 5.1. RQ1: Impact of Hybrid Work on Scrum Master's Autonomy in Work Management

**Research Question: How does hybrid work influence the autonomy of Scrum Masters in managing their work?**

This research question aims to identify whether the hybrid environment is impacting the autonomy of Scrum Masters. Autonomy plays a critical role in the Scrum Master's domain, who must balance team facilitation, stakeholder engagement, and their own responsibilities across both virtual and physical environments. Based on the participants in this research, the factors that affect autonomy in a hybrid environment are both favorable and unfavorable, as well as the challenges they face, particularly in maintaining a balance between private and work life.

**Autonomy in workload and task management**

Hybrid work enhances the freedom to schedule work and decide on their daily work (Morgeson, Humphrey, 2006). In this study, most Scrum Masters, seven out of 10, discuss their autonomy in planning, scheduling, and prioritization. These Scrum Masters coordinate with developers, product owners, and other stakeholders who may be working on different projects and are required to switch teams for each one. Hence, this research found that a hybrid working environment offers greater flexibility for switching between projects.

The research done by Wu explains how it is difficult for females when they work from home, and how it is challenging to balance the workload with home affairs (Wu, et al, 2024). Female Scrum Masters in this research discussed the need to adapt to workload management across

various contexts, which means they frequently need to switch between their private and work lives when working from home.

When there is autonomy, employees take more responsibility and are more deeply involved in the tasks (Cucolaş, Russo, 2023). In this research, it is identified that, along with autonomy, greater accountability comes hand in hand because it requires more responsibility for outcomes, which in turn influences how workload is managed and perceived. Hence, autonomy can have both positive and negative impacts, such as an increase in decision-making power, which increases autonomy, and on the other hand, an increase in monitoring, which reduces autonomy.

This study further identifies that autonomy in workload management is influenced by several factors, including project demands, team dynamics, organizational expectations, and stakeholder pressure.

**Autonomy in decision-making and influence**

According to the results, the majority of Scrum Masters find it quite challenging, and they mostly discuss the constraints and influences on autonomy, as well as hybrid-specific challenges and opportunities related to autonomy in managing workload in a hybrid setup.

Specific constraints identified in this research include resolving issues proactively and making decisions in complex situations. According to the literature review, it is highlighted that employees with high autonomous motivation have a high ability to handle complex tasks and make sound decisions (Deci, et al, 2017). It is therefore a contradiction between the literature review and the research findings in terms of the situation as described.

However, this research identifies that context-dependent factors have an impact on autonomy in decision-making. Some Scrum Masters in this research occasionally come to the office, and that is the hybrid practice they follow. In that case, according to them, decision-making will purely depend on onsite-related factors.

Autonomy in decision-making is not just about individual control, but is also enabled through supportive team interactions and communication mechanisms in hybrid work tools (Wu, et al, 2024). In this study, it was identified that autonomy affects decision-making is empowerment

through team collaboration. Because, in a hybrid environment, it mainly involves daily stand-ups, and then the whole team comes to a collective decision, which also becomes a firm decision.

However, in this research, one Scrum Master emphasized that there is no impact on decision-making autonomy whether one is in an on-premises or hybrid environment; instead, external factors, such as project complexity and stakeholder influence, affect decision-making. This contradicts the literature review. However, according to Wu's research, it is highlighted that volition and personal values require autonomy rather than external factors (Wu, et al, 2024).

**Personal stability and boundary management**.

Work-life balance, which directly supports the autonomy of workers in managing their time and workload (McAnally, Hagger, 2024). Four of the Scrum Masters in this research clearly stated that hybrid work supports a better work-life balance. Although the research initially emphasized the positive aspects mentioned above, it later shifted in different directions, questioning, "Does it really provide work-life balance?" Participants in this research explained that this hybrid work environment leads to extra work. Scrum Masters often struggle to set boundaries that prevent overworking. According to the literature review, Heuristic Principle H2 highlights that maintaining a clear separation between work and personal life is crucial for preserving a sense of control (Wu, et al, 2024).

This research found that the hybrid environment supports mental health while also reducing psychological detachment from work. In other words, during their non-working hours, it is difficult for Scrum Masters to mentally disconnect from work-related thoughts, responsibilities, or stress. This is clearly explained in the research carried out by Deci and the team, where, when the employees find that autonomy is compromised, they find it harder to mentally switch off from work when they're not working (Deci, et al, 2017).

**Interpersonal and organizational dynamics**

In a hybrid environment, it is a challenge to have proper communication, which then leads to undermining autonomy by reducing clarity, choice, feedback, and employees' sense of ownership over their tasks (McAnally, Hagger, 2024). In this research, participants explained that in hybrid environments, online communication is more frequently used, which can lead to

delays in communication; therefore, effective communication tools are necessary. These challenges directly affect the autonomy of the Scrum Master.

Then again, this research identified that these remote tools mitigate the loss of in-person benefits. For example, in this research, a Scrum Master explains that when the team is conducted via MS Teams, it is not a situation where all participants are on camera and challenging to see the facial expressions and cannot identify whether that person is on the same page as others and also about the work status. On the other hand, according to the results, maintaining and having a sustainable relationship with the team enhances the autonomy of the Scrum Masters. Therefore, if a better relationship exists, it reduces the need for face-to-face meetings. This is a further challenge in PI planning.

One additional important aspect identified in this research is the development of documentation that supports autonomy. In a hybrid environment, it is common for these documents to be available online.

According to Scrum Masters in this research, in a hybrid environment, those who go to the office at least one day a week may have more focused work than those working from home. Besides, they argued that it will also be a challenge when the Scrum Master is in the office, as ad hoc interruptions, social pressure, distractions, or micromanagement may occur, thereby reducing autonomy in a co-located environment. This is true with the literature review, as if the employees are in the co-located environment, then close supervision will exist, especially when the managerial style is controlling (Deci, et al, 2017).

**Environment suitability and stability**

This elaborates on how the physical, digital, and organizational environments support or limit Scrum Masters' ability to maintain autonomy and stability in a hybrid work environment. Scrum Masters have more freedom and flexibility in their work schedule, which is particularly beneficial in a hybrid environment. They adapt their work to get the best result. But this is not possible when it comes to being in the office for a specific period. Therefore, greater individual control over the work environment leads to higher autonomy. This is proven in research studies

where it is found that in individuals who experience the freedom to experiment and initiate their own behaviors leads to autonomy in managing workload (Deci, et al, 2017).

However, this research finds that when team members are getting changes continuously, it affects the Scrum Master's autonomy. In hybrid settings, maintaining a stable team is key to enabling self-managed leadership by the Scrum Master. Furthermore, tools like Jira, Miro, or Slack enable Scrum Masters to plan, communicate, and track work independently, eliminating the need for face-to-face interaction. If the Scrum Master requires an instant status update, it is possible to obtain it immediately by simply dropping a message in any of the tools.

Table 7. The key findings of the impact of the hybrid work environment on autonomy.

| **Aspects** | **Impact on autonomy by the hybrid work environment** |
|---|---|
| **Workload and task management** | Autonomy increased in planning, scheduling, and prioritization in a hybrid environment. |
| | Autonomy increases in adapting work management across contexts. |
| | Autonomy is influenced by several factors beyond the hybrid work setup. |
| | Increasing individual control and responsibility affects autonomy in both positive and negative ways. |
| **Decision-making and influence** | The challenge is in resolving issues proactively and making decisions in complex situations. |
| | Context-dependent situations significantly impact autonomy in decision-making. |
| | Empowering autonomy through team collaboration |
| | No influence on the autonomy of making decisions |
| **Personal stability and boundary management** | Work-life balance in a hybrid environment supports autonomy. |
| | Reducing psychological detachment from work affects autonomy. |
| | The need to set work boundaries to maintain autonomy |
| **Interpersonal and organizational dynamics** | The challenge in PI planning in hybrid work is that it decreases autonomy. |
| | The development of documentation increases autonomy. |
| | Focus on work in the office increases autonomy. |
| | Ad hoc interruptions reduce autonomy. |

| | |
|---|---|
| | Uncertainty in team status reduces autonomy. |
| **Environment suitability and stability** | More individual control in behaviours over the work environment, increased autonomy. |
| | Team stability increases autonomy. |

## 5.2. RQ 2: Impact of Hybrid Work on Competence Development and Career Advancement

**Research Question: What are the perceived impacts of hybrid work on the competence and career development opportunities for Scrum Masters in the software sector?**

This research question aims to investigate the impact of hybrid work on competence and career development opportunities, as well as the associated challenges. Interview responses provided mixed perceptions regarding the competence among Scrum Masters operating in hybrid environments. Further, regarding learning and development, they discussed both flexibility and barriers.

**Competence in task management**

Most of the Scrum Masters in this research emphasized the need for planning, preparation, and structure, which is a prominent marker of competence. The Scrum Master should plan and prepare thoroughly for on-premises days to ensure a successful event. This proved how well the Scrum Master manages their tasks, responsibilities, and team processes in the hybrid environment.

This research identifies that Scrum Masters developed the ability to manage tasks and roles more effectively over time through a hybrid work experience. Therefore, long-term adaptability indicates sustained competence and evolution in professional capability. This aspect is found in the literature review that individuals adjust themselves over time in a hybrid environment (Deci, Ryan, 2008). Furthermore, it is essential to utilize digital tools to create a collaborative

workspace. According to the participants, the initiation of these tools mostly occurs through Scrum Masters, which leads to improved team performance.

However, this research found that remote leadership and collaboration are quite challenging in terms of competency in task management, as team members are unlikely to come to the office on additional days, even if they are based in Finland. This challenge is also explained in the research done by McAnally and the team, where if the team is mostly working online, then they feel less sense of responsibility, and that makes the job performance decrease (McAnally, Hagger, 2024).

**Team dynamics and communication**.

Suppose the team connection or communication breaks down or is insufficient. In that case, Scrum Masters may feel less effective in their role, leading to a perception of diminished competence, which will affect the career growth of both the team and the Scrum Master. In this research, the factors and situations that will enhance or diminish team communication and affect competency are identified. Such as based on their experience, some individuals are not confident in the video camera, and hence, the other party does not know what the person is doing, whether the person understands the context of the meeting, which reduces the availability of learning and makes it difficult to make judgments about the team member for further developments.

Furthermore, this study found that collaboration, trust, and team structure influence confidence. One of the Scrum Masters explained that he felt confident with the team because of the good communication within the team. Besides, when the team is adapting to the process, the perceived leadership capability and career growth are affected. This is also identified in the literature review that individuals adapt their skills and behaviors to effectively function in changing team dynamics, and individuals adapt and engage in collaborative environments (Deci, Ryan, 2008).

**Career growth and development access**

It is evident from the discussions held with these experienced Scrum Masters that hybrid work reshapes learning opportunities, mentoring, visibility, and promotions, as well as how they are distributed or accessed.

Most of the Scrum Masters in this study emphasized the importance of flexibility in learning and training. This provides the opportunity for blended learning. It is not always the time in the office, and in a hybrid environment, it is possible to access the materials online (SharePoint). Not only subject matters, but also, it is possible to learn the work ethic through experience. Therefore, regardless of your location, opportunities are available for learning and training. This is proven in the literature review that, if not paired with workplace training or competence-building, it may undermine employees' ability to manage their work (McAnally, Hagger, 2024)

At the same time, the participants in this research argue that, as it is flexible, employees are not taking it seriously to study and are becoming lazy, especially when they are at home, and it is a challenge for them. Moreover, research has shown that a hybrid work environment can negatively impact career progression. Some employees have their own preferences for career growth, which can create a mismatch between their personal working preferences and the organization's hybrid policies, resulting in limited career progression.

In-person visibility support is one aspect identified in this research that affects an employee's career growth. If the team member is in a difficult situation while completing the task, this hybrid work environment sometimes challenging. It is because the Scrum Master is physically available that supporting the task is much easier and effective. This fact is also identified in the literature review. The workplace context may be an essential moderator that supports career development (McAnally, Hagger, 2024).

**About learning, knowledge sharing, and the support system.**

This elaborates on how Scrum Masters acquire new skills, navigate their roles, and pursue upward mobility. This is not just about formal progression, but as a continuous learning journey shaped by the hybrid context. For this, most of the Scrum Masters discussed the support and collaboration systems. Identifying and practicing strong support systems is critical for identifying growth paths and developing competencies. For example, peer support. However, inclusive engagement strategies maintain team engagement across hybrid formats, which touch directly on competence and evolving facilitation skills, and are relevant to career development.

Hybrid work must intentionally adapt team collaboration and idea exchange to promote competence, and a lack of a support system will reduce confidence and developmental growth (Deci, Ryan, 2008). The same was found in this research. This is not only applicable for team members but also for sharing knowledge with cross-functional Scrum Masters. This tends to support career development if deliberate knowledge-sharing practices are maintained.

Informal knowledge sharing, often driven by spontaneous conversations and face-to-face interactions, leads to career development (Deci, et al, 2017). In this research, it is identified that the hybrid working environment reduces informal knowledge sharing because employees are not coming to the office every day.

Scrum Masters rely heavily on collaborative problem-solving as part of agile methodologies (Noli, et al, 2019). Therefore, without regular, in-person interactions, these professionals experience fewer opportunities for real-time feedback and mentoring, which are vital for learning and growth. The importance of face-to-face collaboration for problem solving was identified in this research as crucial for career development. Scrum Masters in this research explained that it is difficult to manage complex problems if the respective parties are not available in person. Furthermore, if they exist, she could solve the problem with a broader perspective, which would then be a career advancement and valuable experience for her.

**Challenges and opportunities to acquire competency in the hybrid environment**

This is where the focus is mainly on external factors, organizational policies, team distribution, communication structures, and leadership approaches that impact competencies in a hybrid environment. The identification is to uncover systemic or environmental barriers that might limit self-efficacy. From that, it could identify the challenges and opportunities that Scrum Masters will face in a hybrid environment.

According to this research, it is highlighted that hybrid work encourages anyone to work from anywhere. McAnally and Hagger discussed adaptation and personal work style. This, depending on individual motivation, values, and adaptability, significantly influences how well employees function in hybrid settings. (McAnally, Hagger, 2024). Similarly, in this research, it is found that, either occasionally or on a single day, they have to come to the office. However, this

research also reveals that time zone changes will be a challenge, as remote team setups and home-office conditions can create logistical and environmental issues that impact collaboration and leadership efficiency.

Hybrid work improves work-life balance, which may positively affect morale and job satisfaction (Deci, et al, 2017). Scrum Masters in this research also agreed that a hybrid working environment improves work-life balance and has a favorable impact on performance, career focus, and long-term development.

One of the challenges identified in this research is the development of leadership and soft skills in a hybrid work context. Participants in this research noted that they have lost confidence in remote contexts when involved in complex projects. Furthermore, it is noted that this environment is significantly more challenging for newcomers, as they require a substantial amount of knowledge to continue their work.

This research found that technical and tool-related challenges affect day-to-day work. Some of the Scrum Master's companies do not provide home broadband connections, which may result in low bandwidth for connecting to the camera. This affects the Scrum Master's competency in terms of career development.

Table 8. The key findings of the impact of the hybrid work environment on competency

| **Aspects** | **Impact on Competency by the hybrid work environment** |
|---|---|
| **Task management** | Proper planning, preparation, and structure increase competency. |
| | Adaptation to a hybrid work environment over time increases competency in task management. |
| | Remote leadership for task management decreases competency. |
| **Team dynamics and communication** | Loss of team connection and communication reduces the competency. |
| **Career growth and development access** | Flexibility and opportunities are available in learning and training. |
| | Challenges in learning and training due to a hybrid working environment |
| | In-person visibility supports career growth. |

| | |
|---|---|
| **Learning, knowledge sharing, and support systems** | The availability of support systems leads to continuous improvement. |
| | Reduces informal knowledge sharing |
| | Face-to-face collaboration is favourable for complex problem-solving. |
| **Challenges and opportunities to acquire competency** | A work-life balance enhances career growth and long-term development. |
| | Lost confidence in a remote context, which affects the acquisition of knowledge |
| | Digital tool-related challenges |
| | Time zone changes affect logistical and environmental issues, which impact leadership. |

## 5.3. RQ 3: Impact of Hybrid Work on Scrum Master's Sense of Relatedness with Their Teams

**Research Question: How does hybrid work affect the relatedness of the Scrum Master with their teams?**

The research question is relevant to the concept of relatedness in SDT. Here, investigate how hybrid work impacts the relationship between the Scrum Master and their team. In other words, the nature, quality, and influencing factors of the Scrum Master's relationship with their team under hybrid work conditions will be discussed.

According to the results, the conceptual framework that was created is as follows. This framework consists of three dimensions: communication effectiveness in hybrid environments, the Scrum Master's role in team engagement, and team connection and collaboration. Each of these dimensions consists of subcategories that favor these dimensions. These subcategories contain facts that encourage them.

**Communication dynamics**

Irrespective of the environment, communication is more challenging (Brunelle, 2021). It will become increasingly crucial in the hybrid environment, as it will limit face-to-face interaction and diminish social presence, potentially weakening interpersonal bonds with coworkers and supervisors (Brunelle, 2021). According to their view, effective communication is important for maintaining a sense of relatedness between Scrum Masters and their teams in a hybrid environment.

This research highlights the importance of communication tools and structured meetings. For example, in hybrid environments, it is essential to have well-organized meetings, whether they are held online or in person. Tools such as Microsoft Teams, Zoom, Slack, and JIRA can be used.

To extend this, Scrum Masters in this research emphasized the need to use the correct communication channel for better communication. To extend this, Scrum Masters in this research noted the need to use the correct communication channel for better communication. It is essential to select the appropriate communication channel based on the urgency and content of the message. Therefore, this concept of using the correct communication channel will impact the relatedness of the Scrum Masters.

However, asynchronous communication and documentation practices lead to filling the gap between remote and on-premises employees (Santos et al, 2024). This is also demonstrated in this research. As Scrum Masters explained in this research, if proper updated documentation exists, it is worth more than hundreds of meetings. This influences how well the team stays informed about team activities and issues.

However, it was identified that communication is influenced more by attitude than by location, which means that effective collaboration depends more on individuals' willingness to communicate proactively than on their physical location. Furthermore, it is identified that communication preferences matter in effective communication. Additionally, some team members rarely respond to emails or chats, which can be considered one-way communication.

In such a situation, it weakens mutual understanding and the sense of being together, and it has a negative impact on relatedness.

**Culture of transparency and open feedback**

This means that maintaining open and honest communication becomes a key strategy for preserving relatedness in hybrid teams. It demonstrates that communication practices are crucial to how Scrum Masters experience and manage their relationships with teams in hybrid environments.

When the team is working from home, even if many urgent emails are sent, it does not guarantee that the recipient will see the email and act accordingly. Also, it is possible that '*Working from home loses team spirit and accuracy of work'* (Al-Habaibeh et al., 2021). Current research also indicates that the hybrid model provides fewer opportunities for Scrum Masters to engage in informal conversations with team members. Therefore, it is important to observe the members' interactions, moods, and engagement levels. The effect of this is that it weakens the relationship and hinders effective involvement when collaboration issues arise.

Furthermore, in a hybrid environment, it is possible that the entire team may not be present in the office at the same time. In that case, it is possible to have less interaction or less direct interaction where there is no clue on what exactly others are doing, as well as it is challenging to get real-time feedback (Cucolaş, Russo, 2023). This research identified that practices such as regular retrospectives and casual knowledge exchanges provide both structured and informal opportunities for Scrum Masters and their teams to reconnect and maintain a sense of shared understanding.

**Scrum Master's role and team engagement**

As is known, a Scrum Master is not considered a management person but a servant-leader (Schwaber, Sutherland, 2020). As the Scrum Master is considered a servant leader by Schwaber, they are always available for help to all, even if they do not belong to his/her Scrum team (Schwaber, Sutherland, 2020) This is expressed by the Scrum Masters who participated in this research, as team members will require Scrum Masters' help at any time. However, they also explained that it is necessary to balance between when the team works independently and when

Scrum Masters must assist. This gives insight into how hybrid work facilitates their day-to-day relatedness and dependency structures.

Being a Scrum Master, it is general that they check for barriers and remove them so that the team can continue the work without delay (Noli, et al, 2019). This aspect is identified in this research as a responsibility of Scrum Masters in a hybrid setup: to identify blockers and maintain team engagement to foster connection.

Scrum Masters are responsible for conflict resolution (Noli, et al, 2019).This conflict resolution is important in relatedness to the team because it will create the team bond and desire for interpersonal connection (Adisaputri et al, 2023) Most of the Scrum Masters who participated in this research manage more than two teams, with a total of more than 10, which, according to them, makes them prone to conflicts. According to the participants, the hybrid environment may be one where misunderstandings arise and reduce natural opportunities for conflict resolution, such as face-to-face discussions**.**

As a Scrum Master, it is necessary to communicate with other Scrum Masters in the development program, and they may be cross-functional (Noli, et al, 2019). According to the results of this research, it is identified that a hybrid working setup enables or enhances cross-team collaboration among Scrum Masters. Furthermore, this research also identifies that sharing these practices with other Scrum Masters within the organization is beneficial.

**Quality of team collaboration and connection**

Relatedness in a hybrid environment involves emotional connection, mutual understanding, and the feeling of being part of a team, analyzing the quality of collaboration**,** and the team connection ( Olafsen et al., 2017). The quality of the collaboration reflects how hybrid work conditions shape the everyday dynamics of collaboration between Scrum Masters and their teams. According to the results, it provides both positive and negative aspects.

In this research, it is found that the hybrid environment diminishes casual interaction. Generally, informal or casual discussions often build trust and friendship. In the hybrid model, this kind of conversation is significantly less likely unless that person meets in an on-premises environment. As per these Scrum Masters' results, except for a few, most of them come to the premises once

or twice, or maybe occasionally. This is also described in Santos and the team's research. It is found that remote work mostly reduces the opportunity for casual or spontaneous discussions (Adisaputri et al, 2023)

One positive aspect identified in this research is continuous collaboration through agile ceremonies. These are improving the quality of team collaboration and connection. Agile ceremonies ensure a structured form of interaction where formal collaboration serves as an anchor for maintaining team-relatedness.

In this research, it is found that remote connection limits connections. This is considered the negative aspect of the hybrid working environment. According to the participants in this research, working from home regularly makes it difficult to maintain a connection with the team, as they often only meet with the team during online meetings, which negatively impacts relatedness.

Table 9. The key findings of the impact of the hybrid work environment on relatedness.

| **Aspects** | **Impact on relatedness by the hybrid work environment** |
|---|---|
| **Communication dynamics** | A correct and effective communication channel increases the relatedness. |
| | Well-organized and structured meetings increase relatedness. |
| | Asynchronous communication and documentation practices bridge the gap, keeping online and offline team members together. |
| | Attitude over location reduces relatedness. |
| **Culture of transparency and open feedback** | Maintaining open and honest communication in a hybrid environment favours relatedness. |
| | Reducing informal conversations with team members in a hybrid working environment reduces the relatedness. |
| | Regular retrospectives and casual knowledge sharing increase team connection |
| | Maintain a balance between when the team works independently and when Scrum Masters must help. |

| | |
|---|---|
| **Scrum master's role and team engagement** | Checking for barriers continuously and removing them promptly will enhance the team's connection. |
| | Effective communication with other Scrum Masters will maintain a connection to the organization-level context. |
| **Quality of team collaboration and connection** | Agile ceremonies increase the quality of team collaboration and connection. |
| | A hybrid working environment can diminish casual interaction, which in turn reduces team connection. |
| | Remote connection limits the quality of the team's connection. |

## 5.4. RQ 4: Exploring the Strategies to Maintain Collaboration and Connection with the Teams

**Research Question: What strategies do they use to maintain collaboration and a sense of connection?**

This research question identified strategies that can be used to maintain collaboration and connection. This is particularly important in a hybrid environment, as it differs from an everyday office environment, where the team typically meets once a week. Therefore, it is likely that the team may not be adhering to the company's expectations, and it is possible that team members do not have a strong connection with one another. To maintain team collaboration and connection, this research identified the strategies that can be discussed here.

**Proactive relationship building and maintaining**

This research identifies the importance of establishing a proactive and strong relationship, as well as a personal bond. Based on the results, it is evident that building a good and proactive relationship requires personal conversations beyond work, team-building activities, face-to-face initiatives to establish foundations, proactive relationship maintenance, and a genuine understanding of team members as individuals.

In this research, it is identified that the strategy to build a strong relationship is proactive relationship building and maintenance. This strategy is primarily employed by Scrum Masters who have been involved in the software sector and agile environments for over five years. They have practiced and experienced the effect of this proactive relationship-building strategy. In this research, it was explained that simply having a cup of coffee can lead to a strong relationship.

Conducting team-building activities is implemented in many organizations to build positive social relationships (Wehmeyer, et al, 2017). This is also identified in this research. According to the Scrum Masters in this research, team-building activities do not have to be in person; they can also be conducted online, such as online cooking classes, sharing cooking recipes, or even a virtual lunch.

It is an interesting strategy, such as getting to know team members personally. This is a psychological aspect, as per the respective Scrum Master, but it is considered a worthy strategy to maintain the relationship. Because if you understand the member, you will have the opportunity to act accordingly, and thus no conflicts will arise, which can damage the relationship.

Face-to-face interactions are valuable for promoting motivation and psychological need satisfaction, especially in early-stage employee experiences, such as onboarding (Deci et al., 2017). Similarly, this research identified the importance of having a face-to-face onboarding process because it allows both parties to gain a better mutual understanding.

**Communication practices**

According to the results of this research, it is found that having regular video calls is the most popular communication strategy. It is considered an important aspect because, from the regular video calls in the first place, team members will be more familiar with these meetings, and in the long run, they will not be off camera as a habit. Additionally, visual feedback is used to ensure a clear understanding of the context. Participants emphasize that when the camera is on, other parties can judge if a person is not actively participating in the meeting, and then it can be directly identified.

Apart from these two major aspects of communication strategies, it is noted that individual-level options were also provided, such as focused communication. This means having a concise discussion and planning the work beforehand.

**Structured collaboration practice**

This research found that a relaxed meeting atmosphere is important for maintaining relationships, as noted by the participants. If the environment is uncomfortable, they will not actively participate. This is explained by Tkalich and the team that, when it comes to a relaxing team atmosphere, it provides psychological safety so that participants will express their concerns more freely ( Tkalich et al, 2024).

When a structured in-person meeting exists, it will increase the psychological safety, facilitating open communication, trust, and effective knowledge sharing among team members (Moe et al, 2023). The same is also identified in this research. According to the Scrum Master's explanation, structured in-person meetings are typically required during PI planning or other Scrum ceremonies.

**Leadership adaptation and support**

Here, the research identified how leadership and support will be utilized as a strategy to maintain the relationship with the team. According to Scrum Masters, this pulling and pushing leadership style is flexible and helps maintain a sense of connection and collaboration, fitting different team needs in a hybrid environment. This research also indicates that individuals with high experience profiles are more likely to engage in this practice. However, participants further express that according to the different teams, adjusting the leadership style is not that simple.

Support from peers helps build team confidence by creating a safe environment (Wehmeyer, et al, 2017). This is also identified in this research, which means that if you keep the team confident and support in what they do, it is easier for team collaboration and for them to stay strong, especially after a disruption.

According to the participants' explanations in this research, it is found that in a hybrid environment, providing help to colleagues or subordinates is not always straightforward, and

they suggested guiding the person instead of offering direct assistance. To make it effective, both parties must be present on the premises on the same day.

Finally, it is identified that setting up mutual expectations early will ensure that members are aware of their responsibilities and how they should collaborate with the rest of the team. According to the Scrum Masters in this research, it creates a clear understanding of the current way of working within the team and reduces future misunderstandings. This is explained by the research done by Wehmeyer and the team. Structured support guides a way that maintains an individual's autonomy and promotes learning, rather than taking over and completing tasks for them (Wehmeyer, et al, 2017).

**Environmental challenges**

However, in this research, environmental challenges are identified as barriers that hinder relationships, trust building, leadership adaptation, and support. There can be many disruptions that the team can experience frequently, and it is also possible to experience a change in configuration, which results in inconsistent team presence and interaction patterns contributing to instability in team development (Adisaputri et al, 2023). This fact, namely the instability of project teams, is also identified in this research. This is where employees frequently resign.

As Scrum Masters explained in this research, in hybrid environments, it is required to make an extra effort to establish a stable or separate connection to maintain a constant link. Because not all companies provide internet access for home usage.

Table 10. The key findings of the strategies to maintain team connection and collaboration.

| **Aspects** | **Strategies to maintain team connection and collaboration** |
|---|---|
| **Proactive relationship building and maintaining** | Conducting team-building activities either online or offline |
| | Getting to know team members personally |
| | Face-to-face interaction in the onboarding process |
| **Communication practices** | Regular video call practices make team members habituated to it. |
| | Visual feedback ensures a clear understanding of team members' expressions. |
| | Maintain a relaxing meeting environment. |

| | |
|---|---|
| **Structured collaboration practices** | Ensure psychological safety for open communication, trust, and effective knowledge sharing among team members. |
| **Leadership adaptation** | Guiding the person instead of offering direct assistance to maintain team connection |
| | Setting up mutual expectations in the early stage |
| **Environment challenges** | The instability of the team negatively affects team connection and collaboration. |
| | Extra effort is required in the hybrid environment to establish and maintain a stable connection. |

## 5.5. Limitation

This research was conducted on Scrum Masters working or residing in Finland. The interview was planned to be approximately 30 minutes. With these constraints, limitations exist within this research.

The first limitation identified in this research is the number of Scrum Masters. Only 10 Scrum Masters are considered in this study because, from research, it is identified that to get the accurate number of themes, it is ideal to have 6-12 (Guest, et al, 2006). But I believe that the number of participants considered in this study restricts the generalizability of the findings. However, the insights gained are very valuable; it would be better to have a broader population of Scrum Masters working in a hybrid environment.

The next limitation is gender distribution. This research was carried out with four male and six female participants. I consider both genders to make the research unbiased. However, if the gender distribution is equal, then the balance could provide deeper insights into perceptions of gender differences. Future research will consider an equal number of participants to understand gender-specific impacts better.

In this research, all participants are based in Finland and work with Finnish companies. The findings may be influenced by specific cultural and organizational practices inherently. For example, the impact of hybrid working environments on Scrum Masters may differ in other regions, such as Asia or the Pacific, with different cultural norms, tax regulations, and work practices. Therefore, results need to be interpreted with caution when applied to Scrum Masters in different geographical and cultural contexts.

In this study, interviews were structured to last approximately 30 minutes, and the duration was informed to all participants before they were invited for the interview. As most Scrum Masters are busy during their working day, they allocate their time for this interview within a strict time frame. Therefore, they are more concerned with limit to those 30 minutes. This is a relatively shorter duration, and because of that, it restricted the depth of information gathered from each interviewee. However, a longer interview or multiple sessions could provide more comprehensive data. Furthermore, if this is the case, it allows for a deeper exploration of the topic discussed and could generate a wider range of insights. Hence, future research requires more time for individual interviews, which may help capture more detailed responses.

Finally, in this research, only Scrum Masters have been considered as the main entity because they are considered servant leaders in agile, which means that they are involved in facilitating and supporting the team dynamics (Schwaber, Sutherland, 2020). Their view of the hybrid working environment might be influenced by their interaction with team members and their roles in managing the team. Furthermore, most of the Scrum Masters in this research are unaware of the company's policy on a hybrid working environment; hence, data collection might be biased. Therefore, when applying the results of this research, it is also necessary to consider other roles within the organization.

## 5.6. Future Research

I suggest having further distinctions based on gender. This is because existing research found quite different answers from female Scrum Masters compared to male Scrum Masters. However, it cannot conclude this because the probability of male to female Scrum Masters is not the same,

and therefore, it would be biased if it were to conclude this in this situation. Therefore, the research question is open for future research.

**Do male and female Scrum Masters experience the impact of hybrid work differently, particularly in terms of autonomy, competence, and relatedness?**

Here, research will explore the differences that hybrid work has made in male and female Scrum Masters, based on three fundamental psychological needs of employees: autonomy over tasks and decisions, competence through opportunities to enhance skills and career growth, and relatedness, or the feeling of connection and helpfulness to teammates.

That will be a very important question, considering how hybrid work affects people differently due to their gender. Finding understanding and appreciation for how each of these differing effects allows for the identification of unique challenges that men and women may face, and their understanding can be crucial in achieving better workplace equality, particularly through hybrid work models that serve everyone. With this, the research will contribute toward inclusiveness and a supportive environment among Scrum Masters in the software industry.

# 6. Conclusion

The research was inspired by the question of how hybrid work arrangements influence the autonomy, competency, and relatedness of Scrum Masters in the software sector. Does it really matter? The result is provided with different aspects, but it is not an exact and stable correct answer. It is not something we can directly say; yes, the hybrid environment is strongly influencing autonomy, competency, and relatedness, either negatively or positively. However, during the discussions, it was found that some workarounds or possibilities may impact autonomy, competency, and relatedness.

The research was conducted with ten Scrum Masters working in Finland-based companies, each with varying years of experience as Scrum Masters. Based on the findings, hybrid environments have both negative and positive effects on autonomy. In terms of positives, a hybrid working environment provides Scrum Masters with the flexibility to adapt workload management across different contexts and freely carry out planning, scheduling, and prioritizing tasks. Digital tools will help bridge the gap between in-person meetings; however, there are circumstances where Scrum Masters face social pressures in physical office environments, uncertainty in team dynamics, and unclear boundaries between work and personal life, which can lead to overwork and affect their autonomy. Additionally, organizational structures or context-specific limitations constrain decision-making autonomy.

It has been identified that, over time, many have adapted to the hybrid working environment, and this is not an overnight process; rather, confidence in navigating hybrid dynamics grows with experience. A hybrid environment requires a high level of planning, preparation, and structure to maintain competence in task management. Leveraging digital tools to foster continuous improvement and collaboration, perceived competence.

It has been identified that hybrid work offers flexibility in accessing learning and training resources, which leads to career growth. Besides, potential barriers for future opportunities are identified as a lack of physical presence, which could limit visibility and recognition. Furthermore, it has been determined that a hybrid working environment diminishes informal

knowledge sharing, which typically occurs through casual office interactions. However, to bridge the gap in in-person problem-solving, structured support systems and collaborative platforms exist. Furthermore, it has been found that a hybrid working environment enhances work-life balance and job satisfaction, but struggles with technical limitations, communication challenges, and the demands of hybrid leadership, which affect its competency.

Relatedness is shaped by communication effectiveness, proactive relationship-building, structured communication practices, adaptive leadership, and environmental challenges. It is found that the importance of choosing the right tools lies in maintaining both structured and informal communication. However, in-person communication is identified as of high importance.

It is found that proactive relationship building plays a major role in maintaining connections, for example, actively engaging in personal conversations, organizing team-building activities, and taking the initiative to understand team members on an individual level. These efforts are identified as important to creating and maintaining trust in a hybrid work environment.

In a hybrid environment, it is required to adapt a suitable leadership style. Building team confidence, setting mutual expectations early, and guiding teams toward autonomy support both task accomplishment and relational needs. However, environmental challenges such as project instability and the effort required for online connection highlighted the extra burden that hybrid workplaces place on maintaining relatedness. These barriers are considered challenges for the strategies used to maintain the relationship with the team.

Further, regular video calls and in-person meetings, with flexibility and focused communication, are considered communication practices. It is found that a relaxed meeting atmosphere ensures clarity. Frequent communication keeps team members on the same page.

# 7. References

Khanna, Christensen et al, 2024. *Hybrid Work meets Agile Software Development.* Online, New York, p. 57–67.

Olafsen et al., 2017. Self-Determination Theory in Work Organizations: The State of a Science. *Annual Review of Organizational Psychology and Organizational Behavior,* 4(https://doi.org/10.1146/annurev-orgpsych-032516-113108), pp. 19-43.

Scrum.org and Berlin Product People GmbH, 2020. *Scrum Master Trends Report 2019.* [Online]
Available at: https://scrumorg-website-prod.s3.amazonaws.com/drupal/2019-02/2019 Scrum Master Trends (2019-02-06).pdf
[Accessed 24 12 2024].

Tkalich et al, 2024. What Happens to Psychological Safety When Going Remote?. *IEEE software,* 41(1)(Online), pp. 1-9.

Accenture, Mimmit Koodaa & Tekniikan Akateemiset, 2022. *Womenintech.fi.* [Online]
Available at: https://womenintech.fi/wp-content/uploads/2022/08/Research-Report-Female-Tech-Student.pdf
[Accessed 20 12 2024].

Adisaputri et al, 2023. *Post-pandemic Resilience of Hybrid Software Teams.* Online, IEEE/ACM, p. 1–12.

Agee, 2009-07. Developing qualitative research questions: a reflective process. *International journal of qualitative studies in education,* 22(4)([Online]), p. 431–447.

Al-Habaibeh et al., 2021. Challenges and opportunities of remotely working from home during. *Global Transitions,* 3(https://doi.org/10.1016/j.glt.2021.11.001), pp. 99-108.

Al-Saqqa, et al, 2020. Agile Software Development: Methodologies and Trends.. *International Journal of Interactive Mobile Technology,* 14(https://online-journals.org/index.php/i-jim/article/view/13269), pp. 246-270.

Anastasia, Leonie, 2024. The Experiences and Views of Employees on Hybrid Ways of Working. *Administrative sciences,* 14 (10)(Online), pp. 263-.

Anastasiia, Brede et al, 2023. *Pair Programming Practiced in Hybrid Work.* Online, ACM/IEEE, p. 1–7.

Andrei, et al, 2019. A STUDY ON USING WATERFALL AND AGILE METHODS IN SOFTWARE PROJECT MANAGEMENT.. *Journal of Information Systems & Operations Management,* Issue Print, p. 125–135.

Anon., 2023. *Annual Report.* [Online]
Available at: https://annualreport.bankoffinland.fi/2023/annual-report/financial-stability/

Anon., 2023. *helsinkitimes.fi/.* [Online]
Available at: https://www.helsinkitimes.fi/finland/finland-news/domestic/23105-finnish-women-see-technology-as-key-to-solving-climate-crisis-but-few-find-tech-industry-attractive.html
[Accessed 20 12 2024].

Babych, 2021. *Free Network.* [Online]
Available at: https://freepolicybriefs.org/2021/12/20/gender-gap-unpaid-care
[Accessed 1 12 2024].

Barath, Schmidt, 2022. Offices after the COVID-19 Pandemic and Changes in Perception of Flexible Office Space. *Sustainability,* 14(18)(https://doi.org/10.3390/su141811158), p. 11158.

Bartholomew, Ntoumanis et al, 2011. Self-Determination Theory and Diminished Functioning: The Role of Interpersonal Control and Psychological Need Thwarting. *Personality & social psychology bulletin,* 37 (11)(Online), p. 1459–1473.

Batra, et al, 2017. Collaboration in Agile Software Development: Concept and Dimensions. *Communications of the Association for Information Systems,* 41(Web), p. 429–449.

Beck, et al, 2001. *Manifesto for Agile Software Development.* [Online]
Available at: http://agilemanifesto.org/principles.html
[Accessed 01 12 2024].

Beck, K., 1999. Embracing Change with Extreme Programming. *Computer (Long Beach, Calif.),* 32.10 (Web), p. 70–77.

Brunelle, F., 2021. Distance Makes the Heart Grow Fonder: An Examination of Teleworkers' and Office Workers: Job Satisfaction Through the Lens of Self-Determination Theory. *Job Satisfaction Through the Lens of Self-Determination Theory,* 11(1)(Online).

Chai, et al., 2023. Lightweight and Fast Physical-Layer Key Generation in FDD Systems Using Random Forest. *Ad hoc networks,* 150(Web), p. 103261.

Chen, et al, 2007. *Light-Weight Development Method: A Case Study..* Web, IEEE, p. 1–6. .

Cucolaş, Russo, 2023. The impact of working from home on the success of Scrum projects: A multi-method study. *The Journal of systems and software.,* 197(Online), p. 197111562–111562.

Darja, Anastasiia et al, 2025. *Dual Effects of Hybrid Working on Performance: More Work Hours or More Work Time.* Bozen-Bolzano, Italy, Online, pp. 63-.

David J. Cord, 2022. *This is finland.* [Online]
Available at: https://finland.fi/business-innovation/finnish-organisation-gets-women-into-coding-and-opens-career-paths
[Accessed 20 12 2024].

De Silva, et al, 2023. The Effectiveness of Code Reviews on Improving Software Quality: An Empirical Study. *International Journal of Recent Technology and Engineering (IJRTE,* Volume 12, pp. 2277-3878.

Deci, Edward, 2001. Need Satisfaction, Motivation, and Well-Being in the Work Organizations of a Former Eastern Bloc Country: A Cross-Cultural Study of Self-Determination.. *Personality & social psychology bulletin,* 27.8(Web), p. 930–942..

Deci, et al, 2017. Self-Determination Theory in Work Organizations: The State of a Science. *Annual Review of Organizational Psychology and Organizational Behavior,* 4(https://doi.org/10.1146/annurev-orgpsych-032516-113108), pp. 19-43.

Deci, Ryan, 2008. Self-determination theory: A macro theory of human motivation, development and health. *Canadian Psychology/Psychologie Canadienne,* 49(3)(Online), p. 182–185.

Dron et al, 2024. *Hybrid Work Meets Agile Software Development: A Systematic Mapping Study..* Web, IEEE, p. 57–67..

Dron, et al, 2024. *Software Companies' Responses to Hybrid Working.* Web, IEEE, p. 244–251.

Elahidoost, et al, 2024. *Practices, Challenges, and Opportunities When Inferring Requirements From Regulations in the FinTech Sector - An Industrial Study.* Online, IEEE, p. 137–145..

Ereiz, Z. a. D. M., 2019. *Scrum Without a Scrum Master..* Web, IEEE International Conference on Computer Science and Educational Informatization (CSEI). IEEE,, p. 325–328.

Filomena, 2023. Self-Determination Theory. In: *Encyclopedia of Quality of Life and Well-Being Research.* s.l.:Cham: Springer International Publishing, p. 6229–6235.

Gagné, M. E. L. D. a. M. G., 2014. The History of Self-Determination Theory in Psychology and Management. In: Web, ed. *he Oxford Handbook of Work Engagement, Motivation, and Self-Determination Theory.* s.l.:United States: Oxford University Press.

Gates, M. F., 2023. *Melinda French Gates on how leaders can boost women's economic power.* [Online]
Available at: https://www.gatesfoundation.org/ideas/articles/melinda-french-gates-how-leaders-boost-womens-economic-power
[Accessed 15 12 2024].

Gerard, Sietse et al, 2018. Working software over comprehensive documentation – Rationales of agile teams for artefacts usage. *Journal of software engineering research and development,* 6(1)(Online), p. 1–2.

Golić, Zorica, 2019. *FINANCE AND ARTIFICIAL INTELLIGENCE: THE FIFTH INDUSTRIAL REVOLUTION AND ITS IMPACT ON THE FINANCIAL SECTOR.* s.l., Web, pp. 61-81.

Gratton, 2021. Four Principles to Ensure Hybrid Work Is Productive Work. *MIT Sloan management review,* Volume 62.2, pp. 11A-16A.

Guest, et al, 2006. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field methods,* 18(1)(Online), pp. 59-82.

Hayata, Han, 2011. *A Hybrid Model for IT Project with Scrum.* Web, IEEE, p. 285–290.

Heath, F., 2021. Introducing the Scrum Master. In: 1st, ed. *The Professional Scrum Master Guide: The Unofficial Guide to Scrum with Real-World Projects.* Birmingham: Packt Publishing, Limited., pp. 30 - 32.

Hyrynsalmi, S. & Sutinen, E., 2019. *The role of women software communities in attracting more women to the software industry in 2019 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC).* Online, IEEE pp. 1–7..

Hyrynsalmi, S. M. et al., 2024. *The Second Round: Diverse Paths Towards Software Engineering', in 2024 IEEE/ACM Workshop on Gender Equality, Diversity, and Inclusion in Software Engineering (GEICSE). 2024 ACM. pp. 29–36.* Lisbon, Portugal, IEEE.

Jerri Ledford, 2024. *Lifewire.* [Online]
Available at: https://www.lifewire.com/big-tech-boys-club-failing-women-8703816
[Accessed 20 12 2024].

Kemell, Saarikallio, 2023. Hybrid Work Practices and Strategies in Software Engineering-Emerging Software Developer Experiences. *IEEE Access,* 11(IEEE), pp. 112861-112876.

Kenneth, 2013. *Sprints.* s.l.:Upper Saddle River, NJ: Addison-Wesley.

Khanna, et al, 2024. *Software Companies Responses to Hybrid Working..* Online, IEEE, p. 244–251.

Khanna, et al, 2024. *Software Companies Responses to Hybrid Working.* Web, IEEE, p. 244–251.

Knopf, J. W., 2006. Doing a Literature Review. *PS, political science & politics,* Issue Cambridge University Press, pp. 127-132.

Komron Rahmonbek, 2024. *strongdm.* [Online]
Available at: https://www.strongdm.com/blog/women-in-tech-statistics
[Accessed 1220 2024].

Ladouceur, J., 2024. *Female Leaders' Lived Experience of Transitioning to Leaders of Knowledge Workers in a Hybrid Workplace Model.* s.l., Doctoral dissertation, Walden University.

Laurie, et al, 2011. Qualitative Research on Software Development: A Longitudinal Case Study Methodology. *Empirical software engineering : an international journa,* 16(1)(Web), p. 430–459.

Le, T. V. & Barboza-Wilkes, C, 2024. How Self-Determination Moderates Burnout in Public Organizations Across Gender, Race, and Generation. *Public personnel management,* Volume 53 (1), p. 113–147.

Ly, et al., 2025. The Power of Words in Agile vs. Waterfall Development: Written Communication in Hybrid Software Teams.. *The Journal of systems and software,* 219(Web), p. 112243.

Lynda, 2021. How to do hybrid right. *Harvard Business Review,* Volume 99(3), pp. 65-74.

Manock, 2025. *Compliance for Software Development in Regulated Industries.* [Online]
Available at: https://www.seriouslyrad.com/compliance-for-software-development-in-regulated-industries
[Accessed 12 02 2025].

McAnally, Hagger, 2024. Self-Determination Theory and Workplace Outcomes: A Conceptual Review and Future Research Directions. *Behavioral sciences.,* 14 (6)(Online), p. 428.

McKinsey Insights, 2021. *What employees are saying about the future of remote work.* [Online]
Available at: https://www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/what-employees-are-saying-about-the-future-of-remote-work
[Accessed 15 12 2024].

Mekler, Tyack, 2020. *Self-DeterminationTheoryinHCIGamesResearch:CurrentUsesandOpenQuestions.* s.l., s.n.

Moe et al, 2023. Understanding the Difference between Office Presence and Co-presence in Team Member Interactions. *arXiv.org.*

Morgeson, Humphrey, 2006. The Work Design Questionnaire (WDQ): Developing and validating a comprehensive measure for assessing job design and the nature of work.. *Journal of Applied Psychology,* 91(6)(https://doi.org/10.1037/0021-9010.91.6.1321), p. 1321–1339..

Neumann, et al, 2022. *What Remains from Covid-19? Agile Software Development in Hybrid Work Organization: A Single Case Study.* Web, IEEE, p. 29–38.

Nolan, et al, 2021. To Work from Home (WFH) or Not to Work from Home? Lessons Learned by Software Engineers During the COVID-19 Pandemic. In: Nolan, ed. *Systems, Software and Services Process Improvement.* Switzerland: Springer International Publishing AG,, p. 14–33.

Noli, et al, 2019. A Study of the Scrum Master's Role.. *arXiv.org,* Issue Web.

Oranga, Matere, 2023. Qualitative Research: Essence, Types and Advantages. *Open Access Library Journal,* Volume 10, p. 12.

Oshri, et al, 2007. Global Software Development: Exploring Socialization and Face-to-Face Meetings in Distributed Strategic Projects. *The journal of strategic information systems,* 16.1(Web), pp. 25-49.

Petrescu, M. A. et al., 2023. *'Women in Scrum Master Role: Challenges and Opportunities', in 2023 IEEE/ACM 4th Workshop on Gender Equity, Diversity, and Inclusion in Software Engineering (GEICSE)..* [Online], IEEE pp. 49–55..

Prenner, et al, 2021. Goals and Challenges in Hybrid Software Development Approaches. *Journal of software : evolution and process,* 33.11(Web).

Rahmatullah. et al, 2022. Team Dynamics in a Hybrid Work Environment: Effective Strategies for Enhancing Employee Performance and Well-being. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting.,* 66 (1)(Online), p. 1085–1089.

Santos et al, 2024. *Post-Pandemic Hybrid Work in Software Companies: Findings from an Industrial Case Study',.* New York, NY, USA, IEEE.

Santos, Paul et al, 2022. *A Grounded Theory of Coordination in Remote-First and Hybrid Software Teams.* New York, NY, USA, IEEE/ACM, p. 25–35.

Santos, Ronnie de Souza et al., 2024. *Exploring Hybrid Work Realities: A Case Study with Software Professionals from Underrepresented Groups..* Web, New York, NY, USA: ACM, p. 27–37.

Santos,Ralph, 2022. *A Grounded Theory of Coordination in Remote-First and Hybrid Software Teams.* New York, NY, USA, IEEE, p. 25–35.

Satu Kiiskinen, 2023. *Helsinki Times.* [Online]
Available at: https://www.helsinkitimes.fi/finland/finland-news/domestic/23105-finnish-women-see-technology-as-key-to-solving-climate-crisis-but-few-find-tech-industry-attractive.html
[Accessed 15 12 2024].

Schwaber, Sutherland, 2020. *The Scrum Guide™.* [Online]
Available at: https://scrumguides.org/docs/scrumguide/v2020/2020-Scrum-Guide-US.pdf
[Accessed 10 12 2024].

Shastri, et al, 2021. Spearheading Agile: The Role of the Scrum Master in Agile Projects.. *Empirical software engineering : an international journal,* 3(Web), p. 26.

Sheryl, Scovell, 2015. *Lean in : women, work, and the will to lead.* London: W. H. Allen.

Sinha, Das, 2021. *Agile Methodology Vs. Traditional Waterfall SDLC: A Case Study on Quality Assurance Process in Software Industry..* Web, IEEE, p. 1–4.

Smart Office, 2024. *21 Updated Hybrid Work Statistics for 2024.* [Online]
Available at: https://smartofficesolutions.com/21-updated-hybrid-work-statistics-for-2024/
[Accessed 15 12 2024].

Stapleton, J., 1999. *DSDM: Dynamic Systems Development Method.".* Web, IEEE, p. 406–406.

Stoyanchev, 2023. *OfficeRnD.* [Online]
Available at: https://www.officernd.com/blog/hybrid-work-quotes/
[Accessed 10 09 2024].

Vansteenkiste, M. et al., 2007. On the relations among work value orientations, psychological need satisfaction and job outcomes: A self-determination theory approach. *Journal of occupational and organizational psychology,* Volume 80 (2), p. 251–277.

Wehmeyer, et al, 2017. Self-determination theory. In: *Development of Self-Determination Through the Life-Course.* 1 ed. s.l.:Dordrecht: Springer Netherlands., pp. 47-54.

Wu, et al, 2024. A Heuristic Design Toolkit for Web Conferencing Software Based on Self-Determination Theory.. *Computer standards and interfaces,* 89(Web), p. 103831.

Yang, et al, 2023. Does Working from Home Work? Experience of Working from Home and the Value of Hybrid Workplace Post-COVID-19. *Journal of corporate real estate,* 25.1(Web), p. 50–76.

Yilmaz, et al, 2021. To Work from Home (WFH) or Not to Work from Home? Lessons Learned by Software Engineers During the COVID-19 Pandemic. In: *Systems, Software and Services Process Improvement.* Ireland: Springer Nature, 2021, pp. 35-54.

Yogeshwar, Hoda, Amor, 2021. Spearheading Agile: The Role of the Scrum Master in Agile Projects.. *Empirical software engineering : an international journal,* 26.1(Web).

Zippa, 2024. *Zippa.* [Online]
Available at: https://www.zippia.com/project-manager-scrum-master-jobs/demographics
[Accessed 24 12 2024].

Zomer, 2023. *The Balancing Act of Valuing Relatedness and Autonomy: A Qualitative Study among Young Professionals Entering the Hybrid Workforce.* s.l., University of Twente.

Appendix 1. Interview questions

1. **General Questions (Professional Background)**
   - **a.** How long have you been working in the software industry, and how long have you been using agile?
   - **b.** How long have you been working as a Scrum Master?
   - **c.** What is your educational background?
   - **d.** Why did you choose to be a Scrum Master? (If the interviewee has some different educational background)
2. **Working environment**
   - **a.** How many teams do you work as a Scrum Master for?
   - **b.** Could you please tell us how big the team is/are
   - **c.** When did your company move to hybrid work? Has it been practiced from the start
   - **d.** Could you describe your company's hybrid work policy?
   - **e.** What is the work arrangement regarding the hybrid work of each team? Is it the same for all the teams, or is it different for each team?
3. **Autonomy**
   - **a.** As a Scrum Master, does hybrid working influence your capability of managing workload and time while keeping a balance between private and professional life? How?
   - **b.** Has hybrid work influenced your independence in daily work and while making decisions? If it has so, how?
4. **Competence**
   - **a.** As a Scrum Master, how confident do you feel managing tasks and projects in a hybrid work setup? Can you elaborate?
   - **b.** What skills or resources could improve your effectiveness?
   - **c.** In your opinion, what is the impact of the hybrid work on learning and growth opportunities for you in the software industry?
   - **d.** Based on your experiences as a Scrum Master, what are the challenges and opportunities you have experienced in acquiring new skills or advancing your career in hybrid work? If possible, could you share some examples?

5. **Relatedness**
    - **a.** In hybrid work, how do you establish and maintain professional relationships with your team members? Any strategies you work on? Can you share some examples?
    - **b.** According to your experiences as a Scrum Master, how does hybrid work affect your collaboration with your team and your connection to the team's progress?
6. **Closing Question**
    - **a.** Anything else that you would like to add that we haven't discussed yet?

Appendix 2. Initial codes generated for research question 1

| # | Name | Reference |
|---|---|---|
| 1 | Autonomy in planning, scheduling, and prioritization | (Morgeson, Humphrey, |
| 2 | Increase control and responsibility | (Cucolaş, Russo, 2023) |
| 3 | Adaptive workload management across contexts | (Wu, et al, 2024) |
| 4 | Reduced psychological detachment from work | (Deci, et al, 2017) |
| 5 | Constraints and influences on autonomy | (Deci, et al, 2017) |
| 6 | Best practice for work-life-balance | (McAnally, Hagger, 2024) |
| 7 | The Initial phase requires face-to-face interaction | ( Tkalich et al, 2024) |
| 8 | Stability of work independence | (McAnally, Hagger, 2024) |
| 9 | Empowerment through team collaboration | (Wu, et al, 2024) |
| 1 | Uncertainty in team status limits to make a decision | (Deci, et al, 2017) |
| 1 | Overworking tendency | (Deci, et al, 2017) |
| 1 | Hybrid flexibility leads to extra work | (Wu, et al, 2024) |
| 13 | No current impact of hybrid work on autonomy | (Wu, et al, 2024) |
| 14 | Communication challenges in a hybrid setup | (McAnally, Hagger, 2024) |
| 15 | Reduced autonomy in a co-located environment | (Deci, et al, 2017) |
| 16 | Control over the work environment | (Deci, et al, 2017) |

Appendix 3. Final codes generated for research question 1

| # | Name | Files | References |
|---|---|---|---|
| 1 | Autonomy in planning, scheduling, and prioritization | 7 | 16 |
| 2 | Workload management depends on various factors | 4 | 5 |
| 3 | Increase control and responsibility | 3 | 4 |
| 4 | Voluntary in-person collaboration | 1 | 1 |
| 5 | Structured hybrid schedule | 1 | 1 |
| 6 | Stability of work independence | 1 | 1 |
| 7 | Adaptive workload management across contexts | 2 | 2 |
| 8 | Reduced commute increases productivity | 1 | 1 |
| 9 | Best practice for work-life-balance | 4 | 6 |
| 10 | Self-management breaks | 1 | 1 |
| 11 | Efficiency gain through reduced commuting (Time Autonomy) | 1 | 1 |
| 12 | Support for personal and family well-being | 1 | 1 |
| 13 | Mental health consideration | 1 | 1 |
| 14 | Creation of an employee-friendly environment | 1 | 1 |
| 15 | Overworking tendency | 1 | 2 |
| 16 | Hybrid flexibility leads to extra work | 2 | 2 |
| 17 | Work-life balance challenges | 2 | 2 |
| 18 | Reduced psychological detachment from work | 1 | 1 |
| 19 | Gendered distribution of domestic responsibilities | 1 | 1 |
| 20 | Reduced autonomy in a co-located environment | 1 | 1 |
| 21 | Consistency in autonomy across work settings | 1 | 1 |
| 22 | Digital tools supporting autonomy in hybrid settings | 1 | 1 |
| 23 | Control over the work environment | 2 | 2 |
| 24 | Importance of a stable team for autonomy | 1 | 2 |
| 25 | Optimizing the work setting | 1 | 1 |
| 26 | PI planning challenges | 1 | 1 |
| 27 | The Initial phase requires face-to-face interaction | 1 | 1 |
| 28 | Better relationships reduce the need for face-to-face | 2 | 2 |
| 29 | Limitations of remote communication for complex | 1 | 1 |
| 30 | Remote tools mitigating loss of in-person benefits | 2 | 2 |
| 31 | Development of documentation supports autonomy | 1 | 1 |
| 32 | Open communication mitigates any loss of autonomy | 1 | 1 |
| 33 | Communication challenges in a hybrid setup | 3 | 5 |
| 34 | Constraints and influences on autonomy | 3 | 5 |
| 35 | Increase decision-making autonomy | 1 | 2 |

| | | | |
|---|---|---|---|
| 36 | Outcome-oriented decision-making | 1 | 1 |
| 37 | Empowerment through team collaboration | 2 | 2 |
| 38 | Decision-making autonomy unaffected by work setting | 1 | 1 |
| 39 | Context-dependent impact on decision-making autonomy | 2 | 2 |
| 40 | Hybrid-specific challenges and opportunities | 3 | 4 |
| 41 | Problem-solving autonomy | 1 | 1 |
| 42 | No current impact of hybrid work on autonomy | 1 | 1 |
| 43 | Resistance to loss of autonomy | 1 | 1 |
| 44 | Reduced informal interruptions | 1 | 1 |
| 45 | Social pressure in the physical office environment | 2 | 2 |
| 46 | Reduce time waste and office distraction | 2 | 2 |
| 47 | Reduced team sensing | 1 | 1 |
| 48 | Uncertainty in team status limits to make a decision | 1 | 1 |
| 49 | Adaptation to remote limitations | 1 | 1 |
| 50 | High workload, but focused on the office | 1 | 2 |
| 51 | Pressure to multitask | 1 | 1 |
| 52 | Lack of downtime and continuous task switching | 1 | 1 |

Appendix 4. Themes generated for research question 1

| Name | Files | References |
|---|---|---|
| (Theme) Autonomy in Workload and Task Manage- | 9 | 31 |
| Autonomy in planning, scheduling, and prioritization | P2, P3, P4, P6, P7, P8, | 16 |
| Workload management depends on various factors | P1, P6, P7, P10 | 5 |
| Increase control and responsibility | P4, P6, P7 | 4 |
| Voluntary in-person collaboration | P7 | 1 |
| Structured hybrid schedule | P8 | 1 |
| Stability of work independence | P5 | 1 |
| Adaptive workload management across contexts | P5, P7 | 2 |
| Reduced commute increases productivity | P10 | 1 |
| (Theme) Work-Life Balance and Well-being | 8 | 19 |
| Best practice for work-life-balance | P1, P2, P9, P10 | 6 |
| Self-management breaks | P2 | 1 |
| Efficiency gain through reduced commuting (Time Autonomy) | P4 | 1 |
| Support for personal and family well-being | P3 | 1 |
| Mental health consideration | P3 | 1 |
| Creation of an employee-friendly environment | P3 | 1 |
| Overworking tendency | P1 | 2 |
| Hybrid flexibility leads to extra work | P1, P9 | 2 |
| Work-life balance challenges | P5, P8 | 2 |
| Reduced psychological detachment from work | P5 | 1 |
| Gendered distribution of domestic responsibilities | P5 | 1 |
| (Theme) Environmental Suitability and Stability | 5 | 8 |
| Reduced autonomy in a co-located environment | P4 | 1 |
| Consistency in autonomy across work settings | P1 | 1 |
| Digital tools supporting autonomy in hybrid settings | P1 | 1 |
| Control over the work environment | P6, P7 | 2 |
| Importance of a stable team for autonomy | P8 | 2 |
| Optimizing the work setting | P6 | 1 |
| (Theme) Communication and Interaction Dynamics | 5 | 14 |
| PI planning challenges | P2 | 1 |
| The Initial phase requires face-to-face interaction | P1 | 1 |
| Better relationships reduce the need for face-to-face | P1, P10 | 2 |
| Limitations of remote communication for complex | P1 | 1 |
| Remote tools mitigating loss of in-person benefits | P1. P8 | 2 |
| Development of documentation supports autonomy | P8 | 1 |
| Open communication mitigates any loss of autonomy | P8 | 1 |
| Communication challenges in a hybrid setup | P8. P9. P10 | 5 |
| (Theme) Decision-Making Autonomy and Influences | 7 | 20 |

| | | |
|---|---|---|
| Constraints and influences on autonomy | P4, P5, P6 | 5 |
| Increase decision-making autonomy | P4 | 2 |
| Outcome-oriented decision-making | P3 | 1 |
| Empowerment through team collaboration | P3, P8 | 2 |
| Decision-making autonomy unaffected by work setting | P1 | 1 |
| Context-dependent impact on decision-making autonomy | P1, P6 | 2 |
| Hybrid-specific challenges and opportunities | P1, P5, P9 | 4 |
| Problem-solving autonomy | P8 | 1 |
| No current impact of hybrid work on autonomy | P9 | 1 |
| Resistance to loss of autonomy | P6 | 1 |
| (Theme) Distractions and Interruptions | 4 | 12 |
| Reduced informal interruptions | P4 | 1 |
| Social pressure in the physical office environment | P3, P4 | 2 |
| Reduce time waste and office distraction | P3, P4 | 2 |
| Reduced team sensing | P9 | 1 |
| Uncertainty in team status limits to make a decision | P9 | 1 |
| Adaptation to remote limitations | P9 | 1 |
| High workload, but focused on the office | P5 | 2 |
| Pressure to multitask | P5 | 1 |
| Lack of downtime and continuous task switching | P5 | 1 |

Appendix 5. Initial codes generated for research question 2

| # | Name | Reference |
|---|---|---|
| 1 | Adaptation over time | (Deci, Ryan, 2008) |
| 2 | Team dynamics and collaborative adaptability | (Deci, Ryan, 2008) |
| 3 | Remote leadership and collaboration | (McAnally, Hagger, |
| 4 | Improved work-life balance | (Deci, et al, 2017) |
| 5 | Flexibility in learning and training | (McAnally, Hagger, |
| 6 | In-person visibility supports task management | (McAnally, Hagger, |
| 7 | Support and collaboration systems | (Deci, Ryan, 2008) |
| 8 | Reduced informal knowledge sharing | (Deci, et al, 2017) |
| 9 | Importance of face-to-face collaboration for problem solving | (Noli, et al, 2019) |
| 10 | Adaptation and personal work style | (McAnally, Hagger, |
| 11 | Improved work-life balance | (Deci, et al, 2017) |
| 12 | Flexibility in learning and training | ( Olafsen et al., 2017) |
| 13 | Knowledge sharing practice | ( Olafsen et al., 2017) |
| 14 | Inclusive engagement strategies | (Deci, Edward, 2001) |
| 15 | Decreased team bonding and collaboration | (Deci, Ryan, 2008) |

Appendix 6. Final codes generated for research question 2

| # | Name | Files | Refer- |
|---|---|---|---|
| 1 | Career development perception | 3 | 4 |
| 2 | Challenges for learning and training Experience | 2 | 3 |
| 3 | Flexibility in learning and training | 4 | 4 |
| 4 | Impact on social and emotional learning and networking | 2 | 3 |
| 5 | Increase personal autonomy | 1 | 1 |
| 6 | Increased competition | 1 | 1 |
| 7 | In-person visibility supports task management | 4 | 4 |
| 8 | Invest in skills and team development | 4 | 6 |
| 9 | Negative impact on career progression | 2 | 2 |
| 10 | Self-driven learning responsibility | 4 | 4 |
| 11 | Technical learning is not significantly affected | 1 | 1 |
| 12 | Adaptation and personal work style | 6 | 9 |
| 13 | Challenges in leadership and soft skills | 2 | 2 |
| 14 | Communication and collaboration challenges | 4 | 7 |
| 15 | Difficulty for newcomers | 1 | 1 |
| 16 | Geographical and environmental considerations | 3 | 5 |
| 17 | Hybrid environment preferences and friction | 4 | 4 |
| 18 | Improved work-life balance | 2 | 2 |
| 19 | Technical and tool-related challenges | 4 | 5 |
| 20 | Adaptation over time | 4 | 4 |
| 21 | Agile leadership transformation | 1 | 1 |
| 22 | Confident in a hybrid environment | 4 | 4 |
| 23 | Handling external pressure | 1 | 1 |
| 24 | Need for planning, preparation, and structure | 5 | 5 |
| 25 | Remote leadership and collaboration | 2 | 2 |
| 26 | Remote leadership gap | 1 | 1 |
| 27 | Self-management and discipline in hybrid settings | 2 | 2 |
| 28 | Task-dependent performance | 1 | 1 |
| 29 | Team dynamics and collaborative adaptability | 4 | 7 |
| 30 | Use tools for continuous improvement and collaboration | 3 | 5 |
| 31 | Adaptation to virtual tools | 2 | 3 |
| 32 | Importance of face-to-face collaboration for problem solving | 1 | 1 |
| 33 | Inclusive engagement strategies | 2 | 2 |
| 34 | Knowledge sharing practice | 3 | 4 |
| 35 | Lack of hybrid work training and research | 1 | 1 |
| 36 | Limited observational capacity | 2 | 2 |
| 37 | Reduced informal knowledge sharing | 1 | 1 |
| 38 | Support and collaboration systems | 4 | 4 |
| 39 | Building psychological safety in one-to-one meetings | 3 | 3 |

| | | | |
|---|---|---|---|
| 40 | Challenges in mixed presence facilitation | 1 | 1 |
| 41 | Communication challenges | 3 | 5 |
| 43 | Decreased team bonding and collaboration | 1 | 1 |
| 44 | Importance of In-person interaction for trust building | 5 | 6 |
| 45 | Investing in communication tools | 1 | 1 |
| 46 | Respect for the role diminished | 1 | 1 |
| 47 | Team connection & communication | 2 | 3 |
| 48 | Video communication practice | 2 | 3 |

Appendix 7. Themes generated for research question 2

| Name | Files | References |
|---|---|---|
| (Theme) Career Development and Growth Opportunities | 9 | 33 |
| Career development perception | P1, P3, P7 | 4 |
| Challenges for learning and training Experience | P2, P4 | 3 |
| Flexibility in learning and training | P3, P5, P7, P10 | 4 |
| Impact social and emotional learning and networking | P1, P5 | 3 |
| Increase personal autonomy | P4 | 1 |
| Increased competition | P1 | 1 |
| In-person visibility supports task management | P1, P6, P7, P8 | 4 |
| Invest in skills and team development | P3, P4, P6, P10 | 6 |
| Negative impact on career progression | P6, P7 | 2 |
| Self-driven learning responsibility | P3, P4, P7, P8 | 4 |
| Technical learning is not significantly affected | P5 | 1 |
| (Theme) Challenges and Opportunities in Hybrid Context | 10 | 35 |
| Adaptation and personal work style | P2, P3, P4, P6, | 9 |
| Challenges in leadership and soft skills | P7, P8 | 2 |
| Communication and collaboration challenges | P3, P5, P7, P9 | 7 |
| Difficulty for newcomers | P1 | 1 |
| Geographical and environmental considerations | P1, P5, P8 | 5 |
| Hybrid environment preferences and friction | P2, P5, P6, P9 | 4 |
| Improved work-life balance | P3, P7 | 2 |
| Technical and tool-related challenges | P1, P2, P3, P5 | 5 |
| (Theme) Competence and Task Management in Hybrid | 10 | 33 |
| Adaptation over time | P1, P5, P8, P9 | 4 |
| Agile leadership transformation | P3 | 1 |
| Confident in a hybrid environment | P2, P6, P9, P10 | 4 |
| Handling external pressure | P9 | 1 |
| Need for planning, preparation, and structure | P2, P5, P6, P7, P9 | 5 |
| Remote leadership and collaboration | P3, P6 | 2 |
| Remote leadership gap | P4 | 1 |
| Self-management and discipline in hybrid settings | P1, P10 | 2 |
| Task-dependent performance | P10 | 1 |
| Team dynamics and collaborative adaptability | P3, P5, P7, P8 | 7 |
| Use tools for continuous improvement and collaboration | P1, P6, P8 | 5 |
| (Theme) Learning, Knowledge Sharing, and Support System | 8 | 18 |
| Adaptation to virtual tools | P8, P9 | 3 |
| Importance of face-to-face collaboration for problem solv-ing | P9 | 1 |
| Inclusive engagement strategies | P8, P9 | 2 |
| Knowledge sharing practice | P2, P3, P9 | 4 |

| | | |
|---|---|---|
| Lack of hybrid work training and research | P5 | 1 |
| Limited observational capacity | P1, P5 | 2 |
| Reduced informal knowledge sharing | P4 | 1 |
| Support and collaboration systems | P3, P4, P6, P9 | 4 |
| (Theme) Team Dynamics and Communication | 9 | 25 |
| Building psychological safety in one-to-one meetings | P3, P8, P9 | 3 |
| Challenges in mixed presence facilitation | P9 | 1 |
| Communication challenges | P2, P7, P9 | 5 |
| Decreased team bonding and collaboration | P3 | 1 |
| Importance of In-person interaction for trust building | P1, P5, P6, P9, | 6 |
| Investing in communication tools | P7 | 1 |
| Respect for the role diminished | P5 | 1 |
| Team connection & communication | P3, P7 | 3 |
| Video communication practice | P1, P5 | 3 |

Appendix 8. Initial codes generated for research question 3

| # | Name | References |
|---|---|---|
| 1 | Casual interaction loss | (Santos et al, 2024) |
| 2 | Impact of conflict resolution | (Adisaputri et al, 2023) |
| 3 | Finding the requirement of a Scrum Master's help | (Schwaber, Sutherland, 2020) |
| 4 | Loss of real-time feedback loop | (Cucolaş, Russo, 2023) |
| 5 | Mutual support and efficiency awareness | (Wehmeyer, et al, 2017) |
| 6 | Need for checking blockers and maintaining engage- | (Noli, et al, 2019) |
| 7 | Asynchronous communication & documentation practices | (Santos et al, 2024) |
| 8 | Regular retrospectives and informal knowledge sharing | (Cucolaş, Russo, 2023) |
| 9 | Limited observability of interpersonal dynamics | (Al-Habaibeh et al., 2021) |

Appendix 9. Final codes generated for research question 3

| # | Name | Files | References |
|---|---|---|---|
| 1 | Asynchronous communication & documentation practices | 1 | 1 |
| 2 | Attitude over location | 1 | 1 |
| 3 | The benefit of transparency and open communication | 1 | 1 |
| 4 | Casual interaction loss | 3 | 3 |
| 5 | Communication preferences matter for effective communication | 1 | 1 |
| 6 | Continuous collaboration through agile ceremonies | 1 | 1 |
| 7 | Easier collaboration with other Scrum Masters | 1 | 1 |
| 8 | Face-to-face interaction has benefits | 2 | 2 |
| 9 | Finding the requirement of a Scrum Master's help | 1 | 1 |
| 10 | Geographically nearby is beneficial | 2 | 2 |
| 11 | Impact of conflict resolution | 1 | 1 |
| 12 | Importance of communication tools and structured meetings | 2 | 2 |
| 13 | Lack of spontaneous communication in both hybrid and on-site work | 1 | 1 |
| 14 | Limited observability of interpersonal dynamics | 2 | 2 |
| 15 | Loss of real-time feedback loop | 1 | 1 |
| 16 | Mutual support and efficiency awareness | 1 | 1 |
| 17 | Need for checking blockers and maintaining engagement | 1 | 1 |
| 18 | One-way communication | 1 | 1 |
| 19 | Perceived minimal impact of hybrid work on relatedness | 1 | 1 |
| 20 | Regular retrospectives and informal knowledge sharing | 1 | 1 |
| 21 | Remote connection limits connections | 3 | 3 |
| 22 | Self-organized teams improve team progress | 1 | 1 |
| 23 | Strategic use of the communication channel | 1 | 1 |
| 24 | Structure and flexibility enhance well-being and team satisfaction | 2 | 2 |

Appendix 10. Themes generated for research question 3

| Name | Files | References |
|---|---|---|
| (Theme) Communication Dynamics | 6 | 8 |
| Asynchronous communication & documentation practices | P6 | 1 |
| Attitude over location | P1 | 1 |
| Communication preferences matter for effective communication. | P7 | 1 |
| Importance of communication tools and structured meetings | P2, P6 | 2 |
| Lack of spontaneous communication in both hybrid and on-site work | P2 | 1 |
| One-way communication | P5 | 1 |
| Strategic use of the communication channel | P4 | 1 |
| (Theme) Culture of Transparency and Open Feedback | 5 | 5 |
| Limited observability of interpersonal dynamics | P5, P9 | 2 |
| Loss of real-time feedback loop | P4 | 1 |
| Regular retrospectives and informal knowledge sharing | P6 | 1 |
| The benefit of transparency and open communication | P3 | 1 |
| (Theme) Quality of Collaboration and Team Connection | 9 | 13 |
| Casual interaction loss | P4, P7, P10 | 3 |
| Continuous collaboration through agile ceremonies | P3 | 1 |
| Face-to-face interaction has benefits | P1, P6 | 2 |
| Geographically nearby is beneficial | P9, P10 | 2 |
| Mutual support and efficiency awareness | P3 | 1 |
| Remote connection limits connections | P4, P7, P10 | 3 |
| Self-organized teams improve team progress | P8 | 1 |
| (Theme) Role of the Scrum Master in Team Engagement | 6 | 7 |
| Easier collaboration with other Scrum Masters | P5 | 1 |
| Finding the requirement of the Scrum Master's help | P9 | 1 |
| Impact of conflict resolution | P1 | 1 |
| Need for checking blockers and maintaining engagement | P2 | 1 |
| Perceived minimal impact of hybrid work on relatedness | P2 | 1 |
| Structure and flexibility enhance well-being and team satisfaction | P3, P7 | 2 |

Appendix 11. Initial codes generated for research question 4

| # | Name | References |
|---|---|---|
| 1 | Building team confidence | (Wehmeyer, et al, 2017) |
| 2 | Structured in-person meetings | (Moe et al, 2023) |
| 3 | Fostering a relaxed meeting atmosphere | ( Tkalich et al, 2024) |
| 4 | Instability of project teams | (Adisaputri et al, 2023) |
| 5 | Setting mutual expectations early | (Wehmeyer, et al, 2017) |
| 6 | Face-to-face initiatives to build foundations | (Deci, et al, 2017) |
| 7 | Team building activities | (Wehmeyer, et al, 2017) |
| 8 | Use of digital communication tools | (Rahmatullah. et al, 2022) |
| 9 | Managing team dynamics during changes | (Santos, Paul et al, 2022) |

Appendix 12. Final codes generated for research question 4

| # | Name | Files | References |
|---|---|---|---|
| 1 | Adapting leadership style (pulling and pushing) | 1 | 1 |
| 2 | Building team confidence | 1 | 1 |
| 3 | Face-to-face initiatives to build foundations | 1 | 1 |
| 4 | Focused communication | 1 | 1 |
| 5 | Fostering a relaxed meeting atmosphere | 1 | 1 |
| 6 | Frequent communication | 1 | 1 |
| 7 | Instability of project teams | 1 | 1 |
| 8 | Managing team dynamics during changes | 1 | 1 |
| 9 | Offering guidance instead of direct help | 1 | 1 |
| 10 | Personal conversation beyond work | 5 | 7 |
| 11 | Proactive relationship maintenance | 1 | 1 |
| 12 | Punctuality and inclusive communication | 1 | 1 |
| 13 | Regular video calls | 4 | 4 |
| 14 | Setting mutual expectations early | 1 | 1 |
| 15 | Structured in-person meetings | 2 | 2 |
| 16 | Team building activities | 3 | 3 |
| 17 | Understanding team members personally | 1 | 1 |
| 18 | Use of digital communication tools | 2 | 2 |
| 19 | Visual feedback to ensure understanding | 1 | 1 |

Appendix 13. Themes generated for research question 4

| Name | Files | References |
|---|---|---|
| (Theme) Structured Collaboration Practices | 3 | 3 |
| Structured in-person meetings | P3, P8 | 2 |
| Fostering a relaxed meeting atmosphere | P5 | 1 |
| (Theme) Proactive Relationship Building | 8 | 14 |
| Understanding team members personally | P9 | 1 |
| Team building activities | P1, P2, P8 | 3 |
| Proactive relationship maintenance | P7 | 1 |
| Personal conversation beyond work | P1, P4, P5, P6, P10 | 7 |
| Face-to-face initiatives to build foundations | P6 | 1 |
| (Theme) Communication Strategies | 8 | 10 |
| Visual feedback to ensure understanding | P5 | 1 |
| Use of digital communication tools | P2, P4 | 2 |
| Regular video calls | P1, P4, P5, P6 | 4 |
| Punctuality and inclusive communication | P10 | 1 |
| Frequent communication | P5 | 1 |
| Focused communication | P3 | 1 |
| (Theme) Adaptive Leadership and Team Support | 2 | 5 |
| Setting mutual expectations early | P6 | 1 |
| Offering guidance instead of direct help | P9 | 1 |
| Managing team dynamics during changes | P9 | 1 |
| Building team confidence | P9 | 1 |
| Adapting leadership style (pulling and pushing) | P9 | 1 |
| (Theme) Challenges to Connection | 2 | 2 |
| Instability of project teams | P1 | 1 |
| Extra effort on the online connection | P1 | 1 |

Appendix 14. AI declaration

LUT University

## Declaration of AI Usage

First name: Kasuni
Last names: Sugathadasa
Degree Programme: Master's Program in Software Product Management and Business
The title of the thesis work in English: Explore the impact of hybrid work in the software sector through the lens of self-determination theory.
Supervisor(s): Ms. Maria Paasivaara - Professor (Tenured) | Software Engineering
Ms. Sonja Hyrynsalmi - Post Doctoral Researcher | Software Engineering

I, the undersigned, in line with LUT AI usage recommendations and policy (https://elut.lut.fi/en/completing-studies/rules-and-regulations/ai-based-tools-policies ) hereby declare the following regarding the usage of AI tools in the development of the contents of my thesis work:

*1a) AI Tool Name: Grammarly AI tool*
*1b) Purpose of Use: Language maintenance*
*1c) Detailed explanation of how and in which sections the tool was used: Throughout the document, grammar and spelling checking are done via the Grammarly AI tool*

*2a) AI Tool Name: Copilot AI tool*
*2b) Purpose of Use: Understand the concepts.*
*2c) Detailed explanation of how and in which sections the tool was used: Searching for information within constraints, understanding the concepts, and testing own knowledge.*

I declare that no other AI assistance or tools were used in the development of the contents of my thesis work other than the above-mentioned.

Date: 14.01.2025
Signature: Kasuni Gayanthika Sugathadasa