

MESG
MESTRADO EM ENGENHARIA
DE SERVIÇOS E GESTÃO

**Exploring how agile methodologies can be implemented in a
context of geolocated departments**

Rúben Tiago Vieira da Eira

Master Thesis

Supervisor at FEUP: Prof.^a Doutora Maria Gabriela Beirão dos Santos

Supervisor at Bosch Security Systems: Luana Pinto Rocha



2024-06-28

“Wisdom is not a product from schooling but of the lifelong attempt to acquire it” - Albert Einstein

Resumo

Em todo o mundo, diferentes empresas são constituídas por funcionários que trabalham a partir de locais distintos e que interagem entre si. Isto requer mecanismos que suportem a articulação entre equipas e promovam a produtividade das organizações. A realidade do trabalho remoto representa um grupo de desafios para as empresas, mas também uma oportunidade para as mesmas evoluírem e implementarem melhores e mais eficientes metodologias de trabalho. Um exemplo disso mesmo é o método Agile, composto por um conjunto de ferramentas que fomenta o rendimento geral.

O objetivo do presente trabalho consiste em explorar como é que o Agile pode ser implementado em departamentos que operam desde locais dispersos. Uma série de entrevistas foram conduzidas e posteriormente analisadas para providenciar um profundo reconhecimento dos fatores a considerar durante a implementação do Agile, bem como avaliar se esta abordagem é apropriada para endereçar os desafios das organizações.

Foi demonstrado que o Agile contribui para mitigar os desafios das empresas, através do uso dos seus recursos e procedimentos. Relativamente à implementação da metodologia, foi possível identificar alguns fatores que a podem afetar, como a dimensão do projeto e a sua complexidade, a mentalidade de silo, e a dimensão das equipas. Também foi concluído que a metodologia Agile pode ser implementada com sucesso num departamento com trabalhadores em locais distintos. Isto é possível devido à constante comunicação e feedback dentro das equipas, e pelo uso de diferentes ferramentas, que permitem aos membros das equipas encurtarem a distância física e manter o espírito de equipa.

Palavras-chave: Metodologia Agile; trabalho remoto; organizações; desafios

Abstract

Across the world, different companies are constituted by employees working from distinct places and interacting between themselves. This requires mechanisms that can support the articulation between teams and foster productivity of the organizations. The reality of working remotely represents a group of challenges for the companies, but also an opportunity for them to evolve and implement better and more efficient working methodologies. One example of it is the Agile method, composed by a set of tools that enhance the overall performance.

The purpose of this paper is to explore how Agile can be implemented in departments that are operating from dispersed locations. A series of interviews were conducted and later analyzed to provide a deeper acknowledgement of factors to consider when implementing Agile, as well as evaluating if this approach is suitable to address the organization's challenges.

It was demonstrated that Agile contributes to mitigate companies' challenges, through the use of its resources and procedures. Concerning the methodology's implementation, it was possible to identify some factors that can affect it, as the project's scope and complexity, the silo mentality, and the dimension of the teams. It was also concluded that Agile methodology can be successfully implemented in a department with workers located in distinct locations. This is possible due to a constant communication and feedback within the teams, and because of the use of different tools, which allows team members to short the physical distance and maintain the team spirit.

Keywords: Agile methodology; remote work; organizations; challenges

Acknowledgments

Gostaria de agradecer a todos os que de alguma forma contribuíram para que esta etapa se tornasse realidade.

Um especial agradecimento à minha orientadora, a Professora Gabriela Beirão, pelo apoio incansável, assim como pela excelente mentoria e orientação científica.

Aproveito para agradecer ao Professor Jorge Grenha Teixeira pela importante orientação inicial e disponibilidade para me ajudar.

Obrigado à Luana Rocha, a minha orientadora na empresa, por toda a sua cooperação para com o desenvolvimento deste projeto.

Um enorme agradecimento aos meus pais, Márcia e Francisco, por todo o seu apoio ao longo da minha vida e, por desde cedo me darem a liberdade de escolher o meu caminho, e ao mesmo tempo me apoiarem de forma incondicional.

Aos meus avós, Áurea e Constantino, agradeço por me incentivarem a ir mais longe e por estarem sempre ao meu lado.

À minha namorada, Joana, agradeço por ter sido o meu maior apoio nesta etapa, estando ao meu lado nos momentos mais difíceis e incentivando-me.

Agradeço aos meus sogros, Lúcia e Mário, por todo o apoio durante esta fase.

Obrigado ao meu tio Zé que, apesar de agora estar mais longe, continua a encorajar-me a ir mais além.

Agradeço ao meu amigo Diogo, por todo o seu companheirismo e força que me deu durante este percurso.

Table of Contents

1	Introduction	1
1.1	Project background	1
1.2	Problem Description	1
1.3	Research Questions	2
1.4	Study and Project Development at Bosch Security Systems.....	2
1.5	Report outline	2
2	Literature Review	3
2.1	Organizations' context.....	3
2.2	Types of work approaches	3
2.3	Agile Methodologies	4
2.3.1	Characteristics, benefits, and challenges	4
2.3.2	Types of methodologies.....	5
2.4	Integration of Agile in the organizations	8
3	Problem Characterization	10
4	Methodology.....	11
4.1	Comparative analysis of existing approaches.....	11
4.2	Method used in the project	11
4.3	The sample.....	12
4.4	Data collection and analysis	13
5	Results.....	15
5.1	Dispersed work locations	15
5.1.1	Factors that facilitate remote work	15
5.1.2	Negative aspects of remote work.....	18
5.2	Types of working approaches.....	20
5.2.1	Remote vs hybrid.....	20
5.2.1.1	Common aspects	20
5.2.1.2	Hybrid benefits.....	20
5.3	Agile methodology	21
5.3.1	Reasons for choosing Agile	21
5.3.2	Agile implementation.....	23
5.3.3	Agile difficulties and benefits.....	24
5.3.4	Opinion about the methodology.....	27
5.3.5	Teams dimension	27
5.3.6	Agile contribution to short the distance in remote environment.....	28
6	Discussion	29
7	Conclusion, limitations and future work.....	32
7.1	Conclusion.....	32
7.2	Limitations and future work	33
	References.....	34
	Project's contribution for the Sustainable Development Goals (SDGs).....	36
	APPENDIX A: Interview guide for senior profile.....	37

APPENDIX B: Interview guide for junior profile.....	38
APPENDIX C: Informed consent	39

List of Tables

Table 1 - Interviewees' Sociodemographic information	12
Table 2 - Factors facilitating remote work	16
Table 3 - Factors that are negatively affected by online work	18
Table 4 - Factors given for choosing Agile	21
Table 5 - Agile's difficulties and benefits.....	27

List of Figures

Figure 1 - The different phases of Scrum	7
Figure 2 - Process of codification in the Nvivo	14

List of Abbreviations

DSDM – Dynamic Systems Development Method

IT – Information Technology

SDGs – Sustainable Development Goals

1 Introduction

This master's thesis is focused on analyzing the organizations challenges in geolocated working environments and evaluate how Agile methodologies can be implemented within teams that operate in dispersed locations. Considering the existent need of identifying and implementing a work methodology in a department at Bosch Security Systems, the thematic in question will be studied from a literature point of view and data will be collected to support the conclusions.

1.1 Project background

Organizations are existent places where workers can cocreate value and knowledge. The technological evolution enabled the creation of remote work, allowing people to operate away from their company's offices (Sokolic, 2022).

Considering the escalation of usage of remote work in latest times as well as entities' objectives, it is indispensable that companies embrace a work methodology based on agility (Hamouche, 2023). Agile methodology appeared in Japan, in the 1980s, and was then further refined in other nations (Raharjo & Purwandari, 2020). These methodologies were firstly used in the Information Technology (IT) field, and then expanded to other fields of knowledge (Raharjo & Purwandari, 2020).

Even though Agile Methods are greatly used by many organizations and their value is recognized, it is still not clear their impact in improving the group work activities, especially in a context in which the elements are dispersed and the scalability of the programs may vary (Coram & Bohner, 2005). Thus, further research is needed, and this dissertation aims to contribute to better understanding this gap.

1.2 Problem Description

While remote work presents some benefits for the employees and companies, as it leads to bigger levels of production and satisfaction, there are also some downsides on introducing telework, starting for the dubiety of some members regarding the perks of this approach. For example, some companies may have difficulty in identifying who is on service or who is not. Also, the organization's culture and the sharing of know-how can be compromised (Popovici & Popovici, 2020).

Following the mentioned challenges that organizations face, Agile presents a set of best practices that aim to increase the efficiency in a department's processes.

This project aims to determine how Agile methodologies can be established in geolocated teams, by identifying and analyzing the existent organizations challenges and work methodologies' characteristics.

To better understand the topic under research, a literature review will be conducted covering different reliable sources to gather accurate and relevant data to support the following exploration phase.

1.3 Research Questions

This dissertation aims to respond to the following research questions:

- Are Agile methods suitable to address and mitigate organizations' challenges?
- Which factors may impact Agile methods' successful implementation?
- How can Agile methodologies be successfully implemented in a department with workers located in disperse locations around the world?

1.4 Study and Project Development at Bosch Security Systems

The following study will be developed within an existent working environment, at Bosch Security Systems. Some particularities can be enumerated in this context, as for example the fact that distinct departments have their elements placed in several regions around the world. Also, teams' size and the complexity of the projects are not the same in each department.

1.5 Report outline

The present project is composed by seven chapters: introduction, literature review, problem characterization, methodology, results, discussion, and conclusion, limitation and future work.

Starting with the introduction, this chapter provides the context of the theme of this dissertation, containing its background problem, the purpose of this research, the environment in which the study will be developed, as well as how the research gap will be addressed.

The next chapter is the literature review, it will be given a relevant theoretical explanation of the subjects that will be studied.

In the problem characterization section, it will be presented a short description of the company in which the research will take place, the necessity of the organization and how it articulates with the research gap in question.

The methodology section will demonstrate the approach that will be taken to collect the necessary data to evaluate the purpose of this paper.

In the results section, the information from the interviews will be presented.

In the sixth chapter, the discussion, the findings will be debated having in consideration the previous literature review.

The last chapter, the conclusion, limitation and future work, it will provide the final considerations, constraints that occurred during the study's elaboration and prepares the thematic for forthcoming projects.

2 Literature Review

2.1 Organizations' context

Sokolic (2022) mentions that organizations are real locations where different stakeholders can interact between them, by integrating different processes and creating new knowledge. The technological advancement enabled the elaboration of modern methods of laboring. This new paradigm allowed employees to work from home, known as remote work.

Remote work contributes to higher levels of production, as workers are more comfortable in their homes, avoiding losing time with unnecessary activities and being more concentrated (Popovici & Popovici, 2020).

However, when implementing telework there are some difficulties that companies and their employees may face, such as the disbelief of this approach and the benefits that can be produced. For example, one possibility is the challenge of guaranteeing who is in fact working, as well as in which conditions and with which level of competence. Another danger that may come from this implementation is the potential loss of accurate expertise within the team and preserving the company's culture (Popovici & Popovici, 2020).

Considering the increase of remote work in recent years, and the need to align with organizational objectives, it is fundamental that the company adopts a more Agile approach (Hamouche, 2023).

2.2 Types of work approaches

Teleworking, also known as remote work, is a definition given to describe a working approach that consists in operating from home using technological gadgets that the organization provides to perform the tasks (Wontorczyk & Rożnowski, 2022).

The author Vartiainen (2024) refers to hybrid work as a combination of operating from home and presential in the company's facilities.

These types of work enables a balance between professional and personal life because dislocations to the office are not obligated, which contributes to spending more time with the family, and also represents minor costs with transports, increasing the production levels and improving performance in opposite to presential way (Wontorczyk & Rożnowski, 2022).

The agility to perform is a relevant aspect in terms of work achievement and productivity and with no time loss, there are less sensitive complications for the employee (Ng et al., 2022).

When working outside the office environment there is a risk of not fully guaranteeing the company's culture and maintaining close relationships with team members (Marshall et al., 2007). The authors McRae and Kropp (2022, cited by Costa et al., 2022) also mentioned that the lack of contact leads to a fear of transmitting their own opinion and important information, which compromises the evolution.

2.3 Agile Methodologies

2.3.1 Characteristics, benefits, and challenges

Nowadays, there is a high-level competition and complexity of processes, thus is very important to implement Agile environments, since they allow to effectively respond to different demands (Ciric et al., 2019). This new paradigm also means a bigger urgency in the distribution of the product, reinforcing the importance of a straight relation with stakeholders to understand their requirements (Butt et al., 2021).

To simplify processes and better manage teams, companies incorporate work methodologies, as it is the case of Agile (López-Martinez et al., 2016). Agile's origins go back to 1980s Japan manufacturing, and then developed in other sites, as for example in the US, by different practitioners (Raharjo & Purwandari, 2020).

Currently, the use of Agile is no longer a novelty, since more and more companies adopt these methodologies to add value to their business. Best practices lay on shared expertise among the company's employees or external peers (Kerzner, 2018).

These methods are people-centered and aim to improve project development, by stablishing milestones (López-Martinez et al., 2016). In the beginning, these practices were used just in software development, although currently they can be inserted within other IT programs and even other areas of expertise (Raharjo & Purwandari, 2020).

This type of methodology is especially helpful for smaller teams, facing recurrent modifications due to a constant share of information, thus allowing to act faster than the usual (López-Martinez et al., 2016). Uludag et al. (2018), mentions that Agile methodologies not only produce benefits in teams of minor dimensions, as well as placed at the same physical space.

Usually, Agile teams work in the same place, which promotes good communication, trustful relationships and a quick answer to challenges. Nevertheless, this situation is not always possible (Ozkan et al., 2022). Honesty and full transparency are easier within teams that are working together and not dispersed across the world (Kalenda et al., 2018).

One difficulty encountered by practitioners was that fully remotely is not a viable option for these working groups. There can be different types of teams' arrangement in terms of where its members are working from. For instance, a scenario in which all the team members are working at different sites. Another case is when one member or half of the group is working at the office and others from home. Considering that Agile environments rely on a strong team spirit, the geolocated team's reality represents a test to this type of methodologies (Ozkan et al., 2022).

Another difficulty faced when implementing these methods is the struggle to do a shift to this approach, which takes place in different layers of companies. It can happen due to some people starting to sense a feeling of examination. Additionally, managers could begin questioning their role and relevance inside their teams (Kalenda et al., 2018).

Scrum is one of the Agile methodologies that helps to improve the project processes and the overall performance, by allowing the customers intervention. This enables customers to modify requirements that might lead to constraints in project forecasting and control. It plays an

important role in extracting the best of each element of the team and answering to unexpected situations. At the beginning of its implementation, these methodologies can face some barriers, considering the misalignment of employees' knowledge about a company's culture. Even though Agile and Scrum methodologies improve processes and people management, there are also issues that are found in their embracement (López-Martínez et al., 2016).

There are a few risks that might happen when an Agile methodology is being implemented, such as: missing an adequate communication, learning problems and struggle to changes. Another risk factor is the project, especially its size and the adversity to go further in bigger projects. Lastly, the process can also represent a risk to Agile adoption due to the large dimension of the group and/or project, which means that some stakeholders may not be listened to in meetings, resulting in inefficient management of human resources. All the stakeholders should know their roles and what is expected from them (López-Martínez et al., 2016).

Besides the already existing studies of these type of methodologies, there is no literature that analyzes the difficulties faced while scaling in bigger companies. Bigger enterprises represent a more complex environment for the application and scalability of Agile methodologies. The involvement of other teams, especially the ones that are not working with these, demand that all the members are committed and aligned with what needs to be done (Uludag et al., 2018).

Organizations need to understand and adapt to Agile methods, otherwise some problems would come. It is necessary to have the ability to deal with various teams that have different visions, clients' demands and feedback (Kalenda et al., 2018). To implement these methods, it is crucial to understand if the organization's culture is aligned with the culture of this methodology. The organization should be represented by its ability to adapt and for promoting the share of expertise among its employees. The second factor is people because for Scrum methodology to be successful it requires a huge commitment from all the stakeholders in establishing close and clear communication channels (López-Martínez et al., 2016).

Kerzner (2018) says that to achieve a goal, it is necessary to understand what needs to be done and adjusted, by identifying the steps to get there and evolving with the mistakes. This highlights the importance of effective communication between the different departments and the peers involved in the project, and to determine the existent flaws and address them. Following this type of management, people can respond better to change and be faster in terms of time response.

Szulanski (1996) refers that if a company has a consistent know-how, it would be hard for a competitor to replicate it. In the same way, it might be challenging for the new adopter department to imitate others which have already implemented these methods.

2.3.2 Types of methodologies

Zelkowitz (2004) mentions that Agile methods represent a set of best practices that lays on a shared base of identical beliefs. Raharjo & Purwandari (2020), confirm and state that these methodologies are regulated by some foundations. Despite the common ideals, the different Agile methods, such as "Extreme Programming, Scrum, Crystal methods, Feature Driven

Development, Lean Development, and Dynamic Systems Development methodology” act in different ways (Zelkowitz, 2004, p.12).

Extreme Programming contains twelve rules, very clear and straight to the point about how to perform, and it can highlight the following main ideas: the use of user stories and story cards and adopting a more elementary architecture to set up the process (Zelkowitz, 2004). The method lays on six stages: “Exploration, Planning, Iterations to Release, Productionizing, Maintenance, and Death” (Coram & Bohner, 2005, p.1).

Coram and Bohner (2005), claimed that the Exploration stage occurs for several weeks, and represents the moment that the group elements identify the resources that they will use during the program. Then, the working flow moves to the Planning point, where the group alongside with the final client identifies the requirements, establishing the most relevant assets to allocate. A deadline is also set within two months. Next, the Iteration to Release moment consists of developing the newest version, within four weeks, and evaluating it. Once the version is finished, it moves to the following step, the Productionizing. In this step, more experiments are done to guarantee that the client’s expectations are matched. Then, the Maintenance stage allows the team to perform modifications in the version and even different demands from the client. The last moment of this project journey is the Death point, that takes place when the team believes that there is no interest in maintaining the version, even with more updates, once it is not feasible.

Regarding the dimension of the team, it should not exceed ten elements and demands to be placed in the same space. Within this Agile method it is suggested that the development process occurs for two weeks (Zelkowitz, 2004).

Schaber (1996, cited by Zelkowitz, 2004) refers to Scrum as an uncertain method in terms of its evolution. In the words of Coram and Bohner, (2005), Scrum focuses on teams' efficient arrangement, considering a continuous uncertain situation. Below, in the Figure 1, it is demonstrated the different stages of the Scrum method and how they are interrelated.

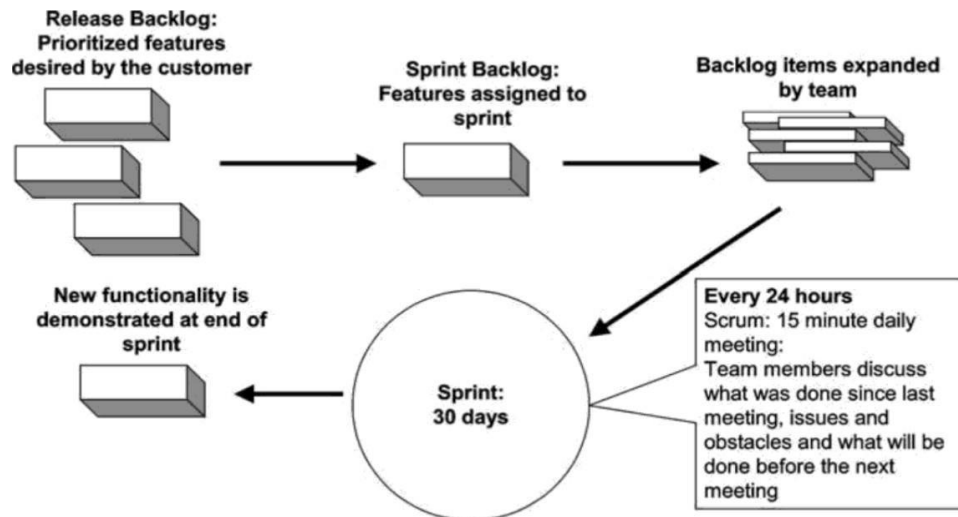


Figure 1 - The different phases of Scrum

As Figure 1 shows, the first step consists of identifying the features to be in the sprint backlog that were firstly required by the customer, located in the release backlog. Then, team members are asked to evolve the project to align with specific objectives and preferences (Zelkowitz, 2004).

Zelkowitz (2004) says that after the previous step being concluded, the Sprint takes place during thirty days, in which the team elements are entitled to develop the project accordingly with the requirements already defined. While the sprint occurs, the people involved in the task analyze what has been doing until the moment and define new strategies. According to Coram and Bohner, (2005), it is needed between three and eight sprints for the program to be finished.

After the Sprint, it is time for the post-sprint meeting, a stage in which the team congregates to exhibit and evaluate the new release. Considering the extension of the team, it is usually divided in groups of seven elements each, and the program generally advances for four weeks (Zelkowitz, 2004).

Another method referred by Zelkowitz (2004) is the Crystal Methods, which says that a good and clear oral communication is better than written communication because it is faster and effective, avoiding failures during the process or misunderstandings. This method allows to incorporate several numbers of elements in one working group, and can take place until four months, especially for bigger and more severe program.

Regarding the Feature Driven Development, the projects should be clear, and every stage should be easily interpreted by every member in the team, and they must know the desired outcome to accomplish. So, teams must focus on the structure at the beginning and then, prioritize what needs to be achieved and worry about the content (Zelkowitz, 2004).

Zelkowitz (2004) says that attending the team's length, it can differ considering the program's characteristics, focusing more on the quality of the group elements. The project usually exists for two weeks. Lean Development focuses on the client's opinion and their satisfaction, so they must be an active part of the process. This method also focuses on the urgency of having a not

complete solution as soon as possible, instead of having a completed one in the near future. Once this method doesn't precisely focus on the evolvement of the project, and instead adopts a more administrative perspective, the team's extension, and period in which the program takes place is not considered (Zelkowitz, 2004).

The Dynamic Systems Development Method (DSDM) is another Agile method based on a framework that consists of six phases. The first phase is the Pre-project, in which necessary resources and conditions are guaranteed for the project to start. Then, it moves to the Feasibility study, where it is backed that the DSDM suits the program in question. The next phase is the Business study, and the project intervenient define the most important tasks to develop. Next, the course of the program moves to the Functional model iteration point, where the team elements stablish what should be the outcome, as well as ensuring that the outcome was successfully accomplished and within the time range defined. Later, the Design and build iteration phase allows the team to assemble the new release achieved in the previous step and distribute it to the customers. The Implementation phase aims to place the newest version fully operational, echoing some of the previous phases if changes are needed. The last phase is the Post-project, in which usual conservation of the outcome is ensured. This method has the particularity of not having an explicit team's dimension or development duration (Zelkowitz, 2004).

The last identified method by Zelkowitz (2004) is Agile Modelling, targets modelling and documentation as crucial in order to achieve a prosperous program. As well as in Extreme Programming and in Agile Modelling communication plays a vital role in the accomplishment of the project. Modifications should be equated and the intervenient should be prepared to failure and to recognize more expertise in the others. Also, considering the fact of this Agile Method not being an evolvement method, and it is then included in different methods, the dimension of the team and the duration of the project will vary depending on the program.

2.4 Integration of Agile in the organizations

Considering the dynamic environment where clients' needs are settled, these methods produce a benefit. One advantage is the possibility to avoid unnecessary expenses due to delayed modifications, through a fast reply. They focus on human resources instead of processes, promoting more original outcomes. Agile methods also stimulate the cooperation of clients during the evolution of the programs. As it was previously mentioned, informal communication is used in Agile environments instead of papers and documents to guarantee a faster way for information to disseminate. At the same time, they also imply dangers in dealing with other interrelated parts of the program (Coram & Bohner, 2005).

Agile methods can produce more effect in companies that do not have any historic of these types of initiatives and use advanced technology. To identify if one of these methods is suitable for a program or not, is a difficult task for the team responsible. They, alongside their team, should be able to analyze, determine, and conduct the inherent risks of the projects. Agile methodology requires cooperation within the team that should be guaranteed by the project manager. This cooperation is even more important considering the case of teams of minor

dimension. These types of teams do not need so much process and schedule to organize the different team elements' actions (Coram & Bohner, 2005).

If a project is set to occur for an extended period, it is important to consider the potential team elements' changes, and it should identify the most urgent tasks. It is crucial that team leaders coordinate teams through a teamwork spirit, letting the authority way of leading aside (Coram & Bohner, 2005).

Coram and Bohner (2005), mentioned that Agile methods are highly used in multiple companies potentially enabling the benefits identified. However, their effectiveness when incorporated in geolocated departments is not yet supported.

3 Problem Characterization

As mentioned in the previous sections, the purpose of this project is to evaluate how Agile methodologies can be implemented in departments containing members working from different locations. The starting point for this investigation was the need of implementing a work methodology within the global training department at Bosch Security Systems – Sistemas de Segurança, S.A.

Bosch Security Systems is a company focused on developing different safety products for individual and collective buyers. Within the company there are several departments as it is the case of the global training department, which is responsible by managing and assuring the operations of certification processes for technical and commercial purposes of the sold products.

Considering the complexity of managing such a department, which has been increasing in terms of elements, it is urgent to identify and implement good organization and work's practices that allows to achieve an efficient and effective resources' management. The way to achieve this is through work methodologies, such as Agile.

Considering the previously described potential advantages of Agile methodology, Coram & Bohner (2005), claimed that it is still yet to be proven its effectiveness in teams working in different sites.

Through the interaction with other departments within Bosch, it will be possible to analyse, identify and develop a number of practices to promote improvements in the management of the department, and also to theoretically contribute to this field of knowledge. This theme has an innovative and challenging character, having into account the different geographic locations of the teams and their stakeholders.

4 Methodology

4.1 Comparative analysis of existing approaches

While conducting a scientific project, it is crucial to be guided by a specific methodology that uses existent and validated techniques and mechanisms (Queirós et al., 2017). Those authors stated that to investigate a certain thematic it can be considered a qualitative or quantitative approach. Having into account a specific situation, the qualitative methodology aims to explain the rationale behind the behaviors taken. The quantitative methodology, based on numerical study, has as its purpose to get rigorous information and is more suitable for cases in which the objective is to gather quantifiable data (Queirós et al., 2017).

Denzin (1989, cited by Rahman, 2017) indicates that the qualitative approach studies describe the way of acting of participants and their confessions, as well as the reasoning that leads to them. Boodhoo and Purmessur (2009) refers that the number of qualitative studies is escalating because of the opportunity to examine different fields of personal attitudes that are not possible to traduce into numerical information.

In this study it will be adopted qualitative research, instead of quantitative research. Considering the type of data to be collected, the first approach suits better as it allows to gather in-depth data to understand the influence Agile methods may have within a department.

4.2 Method used in the project

Within the qualitative approach there are several methods that allow compiling data, that can be done through different ways of interviewing, observation, or texts.

The chosen approach for conducting the investigation phase in this research was the interviews. The interviews are categorized, by Adhabi & Blash Anozie (2017), as formal or informal. Informal interviews are more spontaneous ways of collecting data, which can be practiced in qualitative researchers, but its use is sometimes narrow. Formal interviews take place by guidance of a responsible researcher, who should guarantee the full acknowledgment from the participants of the thematic that is being investigated. This type of interview was identified as the most suitable to apply in this project.

Interviews are categorized as “structured, semi-structured and unstructured” (Alamri, 2019, p.65). These forms of interviews vary according to the role of the investigator in them, having more or less authority (Adhabi & Blash Anozie, 2017).

Stuckey (2013) mentions that in the structured interviews, the researcher totally commands the conversation, not allowing the respondent to express as much as he/she would want. In this kind of interviews, the interviewer intends to get direct responses to what is being asked.

According to Stuckey (2013) similar to the structured interviews, semi-structured interviews are also conducted using a guide with specific topics to discuss. Adhabi & Blash Anozie (2017) says that in this type of discussion, the course of the interview is related to how the person answers. Within the qualitative method, the semi-structured interviews present to be the best way to compile data.

The unstructured interviews do not contain any previous preparation with explicit subjects to debate (Alamri, 2019).

As the goal is to encourage discussion, but with some topics as guides for the conversation, the semi-structured positions itself as the most suitable type of interview to collect information for this project.

4.3 The sample

Once chosen the method to use in this project, it was important to define the sample that would be part of the study.

One of the inclusion criteria was that the interviewees must work with Agile methodology. Thus, were selected employees from two departments at Bosch Security Systems, identified within the company as BDO-BE51 and BDO-BE52. Those employees are responsible for the digital product content chain of this division of Bosch and have implemented Agile methodologies in their units to support the different projects.

Another inclusion criteria were the obligation of the respondents to sign an informed consent, present in Appendix C, in which it was explained that the collected information from the interviews, as well as the sociodemographic data, would be used during this paper and analyzed for statistical purposes, respectively.

The sample is constituted by participants of different ages, number of years in the company, roles within Bosch and academic background, as shown in Table 1.

Table 1 - Interviewees' Sociodemographic information

Age	Time at the company	Role	Academic background
35	13 years	Product Owner	Bachelor in Business Administration and Marketing
25	2 months	Data Engineer	Master in Data Analysis
29	5 years and 6 months	Data Steward	Bachelor In European Studies
48	28 years	Data Steward	High School
30	6 years	Team Leader and Product Owner	Master in Mechanical Engineering – Production Management
24	1 year and 2 months	Data Scientist	Post-Graduation in Mathematical Engineering
29	4 years and 10 months	Product Information Management specialist	Post-Graduation in Digital Marketing and E-Commerce
25	1 year	Data Engineer	Master in Engineering And Industrial Management
33	5 years	Product Information analyst	Master in Industrial Engineering And Management
25	1 year and 1 month	Product Information and Digital Assets manager	Master in Information Science

The age average of this sample is thirty years and three months, while the average time at the company is six years and six months.

4.4 Data collection and analysis

The investigation stage took place between 27th of march of 2024 and 11th of April of 2024, as the interviews were conducted through online calls using Microsoft Teams application and in person at the Bosch facilities. The average time of the interviews was around forty-six minutes and seventeen seconds.

In order to collect data using semi-structured interviews, it was crucial to elaborate relevant questions to ask the interviewees, to obtain valuable insights that would enable answering the research questions.

The interview guide included ten questions aiming to elicit relevant data to answer the research questions. The sample was divided in two accordingly with the interviewees' experience with Agile implementation, since not all participated in the implementation stage of Agile in the departments. Considering this, it was defined that the ones present in the establishment of the methodology would be identified as having a senior profile (Appendix A), and the ones that were not in that moment would be characterized within a junior profile (Appendix B). The two types of interview guides can be found in the appendixes.

Data were analyzed using NVivo software, within the version 14.23.3 (61) of this application. All interviews were verbatim transcribed. Also, to guarantee the anonymity of all the participants, it was attributed a number to each one that does not correspond to the real order that interviews were conducted.

By reviewing the interviews, it was created different codes in the NVivo, related with each questions' topics. Each topic represented a code, and within a code other sub-codes were originated considering related themes. For example, as it shows the Figure 2, for the question regarding Agile's implementation, the respondents stated some factors to consider as well as challenges that occurred or that could have occurred. As so, it was added two sub-codes, one for the difficulties and another one for the aspects to consider. Within each sub-code, the different insights given by the interviewees were aggregated by related themes, resulting in more codes within the previous ones.

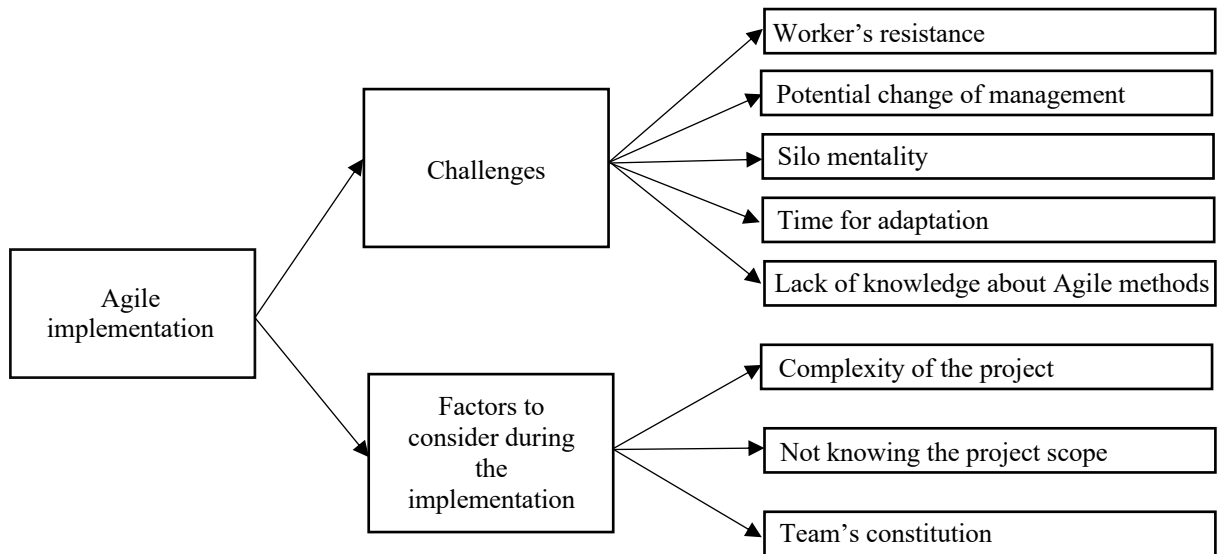


Figure 2 - Process of codification in the NVivo

By doing this, it was possible to gather all the insights from the participants about the thematic being studied and connect what was said by all the participants.

5 Results

This chapter presents the analysis and discussion of the data collected considering the research questions previously presented. Data is organized around the factors that are affected by remote work, as well as the ones that helps to promote it. In this chapter, it is also shown the existent types of working approaches and the influence of Agile methods in dispersed working teams.

5.1 Dispersed work locations

Participants gave valuable insights regarding their experience when operating from distinct sites, in remote mode. Some of those contributions mentioned factors that are damaged by this reality, while others identified aspects that enables operating remotely.

5.1.1 Factors that facilitate remote work

Table 2 presents the factors emerging from data that facilitate remote work and the quotes illustrating those factors. Data is organized around three major themes: accurate expertise and support; company's culture; and workers' feedback.

Considering the participant's reality of operating in a team from different locations, it was asked if it was possible to maintain an accurate expertise across the department. Most of the interviewees answered that it is possible to assure the share of knowledge among the several members due to some factors.

Some of them are the existence of a constant communication, cooperation and feedback. In the opinion of the interviewees, these aspects are enabled by using Agile methods, once attending the different meetings and by applying the available resources, the employees "(...) know what the other ones are doing and working on (...)".

It is important to have a detailed documentation, that consists of all the physical and digital resources to storage information about the projects and the procedures. Considering previous constraints, in the words of one of the interviewees "(...) if in the future they happen again, we know how to handle.". A different respondent also mentioned that this share of expertise is pending on the onboarding process which "(...) it's also really important..".

Another factor mentioned that enables the exchange of knowledge is the safe environment, explained by one participant as "(...) an environment where you can basically step forward and say something and don't be afraid to be judged or criticized in a negative way. (...) So a safe environment, means that you can have your own opinion without (...) having the fear of being mocked off or being judged or something like that (...)". The share of knowledge, in the opinion of one of the participants needs "(...) to be encouraged by the Agile master. It must be encouraged by the product owner to have these exchange times.", which consists of another necessary point to grant the transfer of know-how. It was mentioned that it is possible to maintain an accurate expertise, but "(...) it depends pretty much on the people (...)", considering dependencies of other colleagues from different countries to exchange expertise.

Table 2 - Factors facilitating remote work

Factors facilitating remote work	Description	Quotes from the interviews
Accurate expertise and support	Constant communication, cooperation and feedback	“(…) so with all the meetings we know what the other ones are doing and working on, so I think it doesn't really affect (…)”
	Existence of documentation	“Of course documentation also helps. We kinda try to, these different situations that are occurring, we try to document them, how to be clear if in the future they happen again, we know how to handle.”
	Good onboarding	“If you have invested in creating a good onboarding plan.”
	Safe environment	“We just need to keep that safe environment going.”
	Need for an Agile master	“(…) I think this must be encouraged by the agile master. (…) It must be fostered.”
	Collaboration	“(…) it depends on people. I think it depends totally on people.”
Company's culture	Company support	“(…) if the company itself also gives the methods to it. So, in this case it gives the programs needed for people to work remotely, to communicate remotely. In that way it can be done.”
	Social initiatives	“If for example there are really dedicated times, meetings, events... It can be also a remote event where the company's values are shared, where maybe like town hall meetings, where the company's culture gets visible.”
	Members efforts	“So, like we, I think in our team we always want to help, and everyone is always available to help and I think that's that collaboration. It's some of the company values and I think we can still do that working remotely.”
	Personal values match company's values	“So, you have the company culture and you have also your own values. I think the easier it is when your own values are very similar to the ones from the company. (…) So, if they are very similar, you don't try of anything when you are at the office or at home.”
Workers' feedback	Similar working approach	“(…) I would say it's okay and it's the same thing as in person. Because I also collected some feedback from colleagues in India and it was like almost the same thing as being in person. So, I would say that doesn't affect anything.”
	Creative ways to retain worker's attention	“(…) you have to come up with creative ways together everyone to ensure that you collect the right feedback, that you also have the tools that enable that (…)”
	Having a support buddy during the onboarding	“(…) in the beginning with the attribution of a buddy for the new colleague. So basically, when the new colleague enters our team there is a buddy which explains what needs to be done, where the things are, basically presents everyone to

		that person and I think that facilitates the start for the newcomer basically.”
--	--	---

Another important factor discussed in this study consists in the maintenance of the company's culture. While most of the interviewees feel that it is possible to preserve the culture, some interviewees referred that it depends on the organization's side. One participant says that it is possible to maintain it as long as “(...) if the company itself also gives the methods to it. So, in this case it gives the programs needed for people to work remotely, to communicate remotely. In that way it can be done.”. A different employee also states that if company's rules “(...) are very fixed and strict it's actually easier to keep them and to don't change it based on the different culture or different location where people are working from.”.

Also, it is possible to assure the company's culture as long as personal values matches institution's values. If both values “(...) are very similar, you don't make an effort of anything when you are at the office or at home.”. At the end, “(...) it is really up to the person to live up with that expectation and live up to that culture and that vision.”. Another worker believes that the culture “(...) can also be maintained via remote or with a hybrid methodology (...)”, by making use of different initiatives such as “(...) meetings, events... It can be also a remote event where the company's values are shared, where maybe like town hall meetings, where the company's culture gets visible.”. Furthermore, the same participant talks about the importance of the personal skills, “(...) not to only work on the hard skills, technical topics, but then also to work on the soft skills and I think company's culture is part of the soft skills.”.

The events that take place in different times of the year are very important to maintain the team spirit. For example, in Christmas via online, and during the year when they have the opportunity to reunite everyone in person. Also, another example was the “secret Santa” that happened within the respondent's team, that was done through online mode, and refers that “people just need to do a little bit of effort to keep doing these initiatives to keep the dynamic and a good relationship throughout the team.”. Another option to strength the team spirit is to organize a “team building”, as proposed by one of the interviewees.

Workers' feedback is another factor referred by most of the interviewees as not being affected when working from different places. In general, the participants state that interacting and collecting feedback from colleagues that are in different regions/ countries “(...) it was like almost the same thing as being in person.”.

It was also mentioned that it is necessary to think about new ways to engage with the team members, especially in the case of meetings dedicated to providing feedback, once teams in the past “(...) were able to do some in person and it's quite different, so you have a better feedback, a better feeling about what the other ones are feeling about the sprint, and now being a disperse team, you have to come up with creative ways to face that issue.”.

Even though the onboarding phase can be difficult for a new team member, it is an important step to guarantee the share of feedback between the colleagues, which can be done “(...) in the beginning with the attribution of a buddy for the new colleague. Thus, when the new colleague

enters our team there is a buddy which explains what needs to be done, where the things are, basically presents everyone to that person and I think that facilitates the start for the newcomer basically.”.

5.1.2 Negative aspects of remote work

Table 3 shows the factors, as well as the quotes stated by the respondents, that are damaged by remote work. The information is structured and divided by eight general topics: company’s culture; people’s feedback; focus on the meetings; colleagues’ culture; time zones; team spirit; communication problems; and engagement with the colleagues.

Table 3 - Factors that are negatively affected by online work

Factors negatively affected by remote work	Description	Quotes from the interviews
Company’s culture	Not being physically with colleagues	“You don't even think for which company you are working to. (...) Because yeah once again they are distant from the places where those values are transmitted or shown.”
People’s feedback	Difficult to understand other colleagues’ feedback remotely	“(…) like when you are face to face, you can see the person's reaction and see if the person is understanding what you're saying, when you do this via remote, it's more difficult to understand that, and sometimes the questions only come after they realized (...) you get that feedback later than earlier.”
Focus on the meetings	Difficult to be focused due to lack of interest and feeling alone in a distant place	“Yeah, they will lose attention. They will do something else that this is the big risk of working together remotely that if people are not engaged or if it's not relevant for them very soon they will start doing anything else while being in a meeting but not being there.”
Colleagues’ culture	Challenging to understand other’s behaviour due to cultural differences	“For instance, I work a lot with Indian colleagues and nowadays it's a little bit better, but in the beginning (...) it was a little bit difficult and also, it's another culture. So, they have a way of being that it's so because we had some troubles finding out that when they have an issue or they have problems they rarely say it.”
Time zones	Having colleagues in different countries/ regions	“The time zones, it's really bad because we work with some Indian colleagues and it's hard to schedule meetings for example.”
Team spirit	Difficulty to maintain across different locations	“I think one of the biggest challenges is the team spirit. It's like feeling that you are part of the team. Because you are not always together and when you are, you are in a remote situation. So, I think that maintaining keeping the team spirit, I think it's also it's always very a bit difficult.”
Communication problems	Difficult to communicate due to language accent	“I think the only challenge I can see would be to... I'm not sure what's... but the pronunciation of some team members, like in India, maybe we don't fully understand the message and when we go back and forth, even in the stand-ups and meetings, it may be difficult to understand. I think that's the major one.”

Engagement with the colleagues	Low engagement due to lack of personal relationship	“(…) if there is no personal relationship created, Hum, the engagement of the people in the different locations will be low.”
---------------------------------------	---	---

Even though most of the interviewees stated that both company's culture and workers' feedback are possible to be maintained when working from different locations, some issues that could negatively impact those factors also emerged from data.

Not all respondents felt that company's culture could be maintained, a few stated that it is not possible to maintain the company's culture, due to the physical distance, as they “(…) don't even think for which company (…) I am working for. Not being at the office and interacting with others it can “(…) affects the feeling, the culture and understanding the culture.”.

Concerning the share of people's feedback when working online, one of the respondents says that by giving the feedback on a distance, there is a risk of not realizing if the other person is understanding what is being said “(…) and sometimes the questions only come after they realized, okay, maybe this is not exactly what I was meant to learn, or there is some gap that I still haven't get”.

There were also identified other aspects that are impaired when working from a distance, as for example the difficulty to be focused on the meetings, as “(…) in virtual meetings it's more difficult for you to be fully focused on the topic and following the topic every single time”. One of the interviewees actually says that this “(…) is the big risk of working together remotely that if people are not engaged or if it's not relevant for them very soon, they will start doing anything else while being in a meeting but not being there.”.

Another widely mentioned topic that is affected when operating from distinct sites is the adaptation to different people's culture. The interviewees talked about the posture and kind of approaches that colleagues from different nationalities might have, which are related with cultural habits from their origins. While some nationalities try to be more affable when communicating, others “(…) tend to have a more straightforward approach (…”. For example, one of them says that within the local team, a group of people from the same country with the possibility of being together in person every week, as shown by the quote:

“(…) we have more close relation between all of us. I mean, we have good relation and good team spirit between everyone in the team, but I would have to say, of course, that once we are here on site, it still is different. And even, for example, the culture itself, it influences the teams.”.

This aspect is referred as something that can exist “(…) regardless of the methodology, and something that you simply have to deal with regarding the methodology that you work from the moment that you are in a big team (…”.

Another factor stated by all the respondents is different time zones. Considering the case of the departments that were studied in this research, as they interact with colleagues from distant

locations such as Indian members, the time difference is a “(...) very difficult part of working with such an international and dynamic team.”.

One of the problems faced when operating from different locations is the difficulty in maintaining the team spirit. One of the interviewees says:

“(...) people that are in different locations, the challenge is to make them really feel part of the team. And if they are always alone, if they are always just there remotely, this will not make them feel part of the team.”.

An aspect referred that can also suffer constraints and prejudice communication is the difficulty in understanding of the colleagues' language, as “(...) the pronunciation of some team members, like in India, maybe we don't fully understand the message and when we go back and forth, even in the stand-ups and meetings, it may be difficult to understand.”.

Also, the engagement with the various stakeholders that needs to be reached, stating that while operating in a remote way “the engagement of the people in the different locations will be low”.

5.2 Types of working approaches

During data collection interviewees were asked to compare two ways of working: remote and hybrid. The remote work consists of operating from home, so this means in online mode. Hybrid approach combines both online mode when working outside the office and in-person mode when going to the company.

5.2.1 Remote vs hybrid

5.2.1.1 Common aspects

Across the investigation phase, the interviewees mentioned different factors that can possibly be affected or not when working remotely, as seen, in Tables 2 and 3.

These aspects are also common to hybrid, once within the hybrid method when the employees are working in a home environment, they also face the same conditions as in remote.

5.2.1.2 Hybrid benefits

During the investigation phase, the participants stated some benefits of operating within a hybrid environment when compared to remote.

As this type of work allows to combine both in person and online ways, one of the interviewees mentions that it helps to foster the company's culture, because “(...) if you come to the office like once a week or twice a week, I think that's like the best thing you can have. It's the best of both worlds and even understanding the culture, living the culture.”.

It is also mentioned by the participants that this approach enables a better team spirit, as one of them refers that as a “(...) method is much more efficient. You can still work on the team spirit and team work side and you could also have some benefits (...)”. The same respondent states that if this approach did not exist, and having to work in online mode, “(...) the teamwork and team spirit would be much, much more difficult to improve.”.

Considering the interactions with the stakeholders, one of the interviewees said:

“Only remote does not work. That's my experience. Remote is great because you can collaborate with a lot of different people across continents, different locations, different time zones, but at least once or twice a year, you should have a face-to-face connection.”.

5.3 Agile methodology

5.3.1 Reasons for choosing Agile

The Table 4 demonstrates the different reasons for choosing Agile identified by the interviewees during this research. The respondents gave several different reasons that led or would lead them to choose the Agile methodology. It is also important to consider that some of them were in the initial stage of the implementation in the departments while others were not.

Table 4 - Factors given for choosing Agile

Reasons for choosing Agile	Being used in other departments
	Enable the share of feedback between the team
	Team's location
	Agility to adapt during the project
	Being able to perform tasks division
	Simple use of the methodology
	Being able to foster cooperation between team members
	Foster transparency between everyone involved
	Knowing well the role in the team and the project's purpose
	Not knowing the project scope
	Having a safe space to fail early
	Being able to control the time to finish the project
	Being able to prioritise topics

Most of the participants mentioned the agility itself to adapt as the project evolves. One of the interviewees says that “(...) it's very important to be able to adapt and adjust the tasks as the work is on progress and some new challenge appear basically.”.

One of the respondents mentioned the importance of being able to control the time to finish the project saying that “Having a time frame when you expect this to be completed, that is extremely important. Also explaining very well what is requested in order that you can easily have an idea of how much time you will be needing.”.

Another factor mentioned was the possibility of prioritizing topics, once “(...) if the topic you are going to address is very important or not, because you might have four topics and it's also important to know where to go first. I think it makes this more efficient.”.

One criteria referred by one of the interviewees that was determinant when choosing this methodology was the fact “(...) that other teams that are in projects within Bosch, they already

have this methodology, to work (...). This allowed the responsible for implementing Agile to check on how the methodology was being used and its benefits.

The opportunity to share and give constant feedback during the projects is also referred by some interviewees as relevant because "(...) when we have such a dynamic team where some projects involve a lot of people, I would say it's important to have the possibility of connecting inside a project different people and assign some tasks for one person, assign different tasks for other persons."

One employee also mentioned having a safe space to fail early as another aspect to consider. This is "(...) really important for us because we have a lot of tasks going and we have a lot of technical stuff which takes a lot of time to develop, so it's really useful for us to fail early." This possibility of failing early is also related with the agility of the methodology itself, that was previously mentioned, as an attribute that allows teams to be more efficient finding solutions to some barriers.

One important aspect was people knowing well their role in the team, as well as "(...) knowing what the importance is of what you are going to do." Not knowing the project scope was agreed by most of the interviewees as essential. In the opinion of one of the respondents:

"(...) when you are not 100% sure of what you want to do, what you want to achieve, it is important to have a methodology that is more agile, because then you have the flexibility to adapt or to change something in much shorter notice than if you follow the traditional waterfall way of working."

One factor noticed by one participant was the simple use of the method as a tool. For this worker, "(...) it should be... simple to use, not very complex because it's a thing it's a tool we use every single day. So, I think this must be easy to work with."

The availability to perform tasks division within the project was mentioned as "(...) a very important topic where if you have like a big project, you can then divide it and... broken down into smaller pieces so basically every task is projected and it's documented (...)"

One aspect also referred was the localization of the different team members, understanding if they are all at the same place or operating from different ones, "So even these simple aspects, I think they need to be considered to understand if it's the best approach and if it works inside the team."

Another factor to look at consists of being able to foster cooperation between team members. It should assist "(...) the communication between the team, also the opportunity that all team members have the information needed for understanding each tasks and each project. I would say everything that helps in that matter is a very important topic."

The transparency between everyone involved is another aspect to ponder about. For the project that was being developed initially in the BDO-BE51 department, and considering its complexity, one of the participants that were in the implementation phase evaluated "(...) the agile methodologies which would fit in order to bring transparency to a highly complex topic (...)"

5.3.2 Agile implementation

Considering the implementation of this methodology, the interviewees mentioned some aspects to consider when performing such task and the difficulties that were faced or that they believed could appear, for the ones that have not gone through a process like this.

There is one factor that was identified as being in the Agile decision and Agile implementation moments: not knowing the project scope. In the idea of one of the respondents:

“(...) what can affect the implementation of something is always not knowing the full scope.”

At the same time, the complexity of the project was also another element to take into account, as stated by one of the participants:

“(...) the complexity and the uncertainty, (...) So these are probably the two major topics why we opted for this approach. The complexity, it was pretty obvious as well, because we were still not 100% clear what the project would be, how big it would become, but we knew for sure that based on the business that we have at Building Technologies, based on the complexity of the business, the amount of stakeholders, the amount of locations that we have, we already knew that it was going to be complex”

The team's constitution when preparing for a process of establishment of a method like this, once “(...) choosing the right people always is very important. And when I say the right people, it's the people also who work with it. Not only the people who have the idea but also the people who will work with it on a daily basis.”

Regarding the challenges that have occurred or may occur during the implementation, one of them that was revealed was the human resistance. An interviewee says that “(...) like a human, no work related, but as a human every change, humans have some kind of resistance. Usual to when you try to implement something someone resists or they do not, they are not so open to change.” The potential of “(...) change management (...)”, that can take place at any moment and affect the different parts involved in the project is also important.

The silo mentality was recognized by most of the employees in this study as a challenge that happened or may happen while establishing this methodology:

“(...) there was a silo mentality in each of the business units. For example, a business unit for communication would work in a completely different way of a business unit for video (...)”

Another respondent noticed that some colleagues within the company “(...) were much always thinking about their own (...) They don't use to see the company as a whole. They are always looking at their own silos or activities, so, yeah, I think that could be a problem or a factor, for the success or unsuccess of the agile methodology, for sure.”

The time to adapt to the methodology can also constitute a constraint, due to possessing “(...) in the team different people with different know-how on the methodology (...)”, which may

demand a certain period to accommodate. Not knowing the Agile method was stated as another challenge as “(...) some areas of the company, like for example, hardware development, engineering, not all of these teams use agile yet, and sometimes it is difficult for them to understand what we are doing and how we are doing it (...)”.

5.3.3 Agile difficulties and benefits

Throughout the research, the participants identified difficulties and benefits considering the Agile method.

One challenge identified by an interviewee was the dynamic of the methodology itself, giving the example of “(...) whenever we have like a new sprint and a new sub-task or user story is created, it may be difficult to understand which labels or links, epic links we must assign. (...) in the beginning it may be like a little bit overwhelming to understand all the logistics (...)”.

The content discussed in the meetings was mentioned as a barrier, “(...) because they are too specific or too technical and I completely lost it basically. I cannot be in my... full attention to the meetings and that happens a lot.”.

The duration of the grooming sessions, one type of reunion within Agile, is also identified as representing a constraint. One of the respondents said that perhaps “(...) the grooming sessions are too long or they have like two hours and we usually have like one break in the middle. So maybe one hour straight with information that I'm not used to, it's too much, I'm not sure.”.

Regarding the retrospectives, which are another type of meetings, in the opinion of one employee, and considering that there is a considerable amount of people to share information during a limited period of time, “(...) that's not really helpful to then have not enough time for the team members in order to give their feedback.”.

Another referred struggle was the high number of participants in the meetings. One of the interviewees stated that “(...) when we merged the entire team in one meeting, It was for me personally it was a mess and I think (...) everyone was feeling the same thing and that's actually why we end up we end up to shut down that big meeting and separate a little bit the teams.”.

The number of times that meetings take place is also point out as a difficulty. One participant gave the example of daily meetings that “(...) sometimes it can be too much, and it may block your time to work and work continuously.”.

Considering the Agile tools and the normal workflow of creating and updating a user story, one of the interviewees said that “(...) sometimes a user story can be a little bit complex and time consuming to create.”, and it would be preferable to “(...) having not to write so much and have more options to select.”.

One of the participants mentioned that Jira's (a tool from Agile) transparency represents a constraint, once for more sensitive topics, that are not supposed to be accessed by all the team members, the tools do not provide an efficient alternative to restrict information. The interviewee says “(...) jira is everything, everything open, everything transparent, also the risk management. And therefore, we don't use the risk management in jira, we do it in Excel.”.

About the benefits of Agile, it was identified the agility to adapt during the project, as one of the respondents said “(...) even if you don't have planned something to do in this sprint, you can always put it there. If something is blocking, you can also update it. So, I think it's the flexibility, the possible speed increase in terms of the project, the thing that you deliver.”.

One of the interviewees stated that working within this methodology “(...) it's difficult to lose focus in this way and I think we become more productive and more efficient. That's what I think.”.

Most of the interviewees point out the constant feedback as a benefit enabled by Agile. This is possible due to a “(...) quicker and smaller feedback loop, (...) because every three weeks, every spring release, you get feedback, you get the understanding from either the team or the stakeholders themselves to understand if that goes according to what it was expected, and if not, you can reiterate it.”. The platform provided by this method is also an enabler of this benefit, once “(...) you can leave a comment or some information in the user story and basically the other person that should receive that information will have it and can read it whenever they want.”.

Most of the participants said that Agile also fosters cooperation and collaboration between colleagues. For one of the interviewees working within this approach “(...) it's very beneficial (...) for a better and efficient work between the team members and the collaborations among them.”. This is possible “(...) since we have stand-ups every two days, we talk with each other really frequently, so there is a lot of possibilities for you to ask for help or help another one (...)”. The “(...) easiness to define a complex problem (...)” is another mentioned advantage, “(...) because you can do it by stages, you don't have to think about everything at once from the beginning (...)”.

Some participants also mentioned the employee's autonomy that is facilitated by Agile. One interviewee said that the supervisors “(...) expect from the team itself within Scrum that also has this autonomy of reaching out when there's new topics, so during the spring planning.”, especially when they are not occupied with something in specific. Another interviewee gives a perspective from the employee, saying that the “(...) freedom to work in topics whenever you want, it's really good.”.

Another benefit highlighted by one of the interviewees is the importance of the Agile master, by “(...) reviewing all the user stories in the backlog and check if they are making sense or not at this point of the project.”.

All of them said that the methodology fosters the communication among team members. One of the participants stated that Agile: “(...) can be used as a communication platform, basically for specific, for the specific task. So basically, you don't have to be, want to call with someone if you just have like a small update that you did to some specific tests. So, you can leave a comment or some information in the user story and basically the other person that should receive that information will have it and can read it whenever they want.”.

A different employee supported the same opinion, giving the example of the:

“(...) regular meetings and we always discuss everything that we are working with, and we change ideas with each other (...)”.

The possibility to keep track on the project through the existent meetings is also an advantage, by having the available meetings which “(...) really helps to maintain your work up to date.”. One of the employees also said that this method represents a “(...) structured way of working in a way that we can deliver results in a short time.”, which is another benefit. Another advantage is the time that is saved, once “(...) tasks could be performed faster.”.

Most of the interviewees identified the transparency between everyone involved as a benefit of Agile, that “(...) goes beyond apart from the team itself, but also to the stakeholders.”.

The Jira tool used by the departments studied in this research, was mentioned as an advantage of Agile due to several reasons. It allows to be more focused on work, allows to prioritize topics and to display information in an explicit way. Also, some interviewees identified the collaboration and transparency, as an argument. This mechanism also enables to better organize the information of a project, facilitates the articulation of a bigger team and helps to foster cooperation with non-Agile teams. It was also mentioned that helps to check the progress, once “(...) you have all your tasks or objectives written, so it's easier to have a track on the thing that you need to do.”. It was referred that supports on mitigating doubts regarding remote work and helps to better understand the project.

Another advantage of this methodology is that enables information accessing and storage, by maintaining the latest information available for all the interested parts. From a personal perspective about individual organization, one interviewee said:

“(...) basically the methodology helped me a lot to structure my work and to plan the things that I do. So basically, everything that I do is documented and reported, which for me is also actually very helpful to project my daily work and to be able to basically be applied to report and to document everything that I do. So basically it's (...) an advantage that I have as an obligation to do it.”.

The documentation is also relevant for the team's articulation, one respondent mentioned that:

“(...) everything is documented in our docupedia page that we update often. Every time there is a change, either in the role or either in the person that fulfills that role, we ensure to keep it updated so that people know, okay, if I have any question regarding Agile, I should contact the Agile master, which in this case is the person XYZ, or if I have a question about the scope, then I know it's a task of the product owner.”.

The docupedia page consists of a web page in which different types of data is inserted and shared between colleagues and teams across the organization.

The following Table 5 provides a general visualization of the advantages and disadvantages of working within an Agile environment that were discussed in this chapter.

Table 5 - Agile's difficulties and benefits

Agile	
Difficulties	Benefits
Hard to understand Agile's dynamic Meetings with high number of participants Meetings' content not interesting Not enough meeting's time Meetings taking too long Too many meetings Lacking confidentiality feature It requires too much time to perform a task	Agility to adapt during the project Increases productivity Enables constant feedback among team members Fosters cooperation and collaboration Facilitates complex problem definition Enables employee's autonomy Importance of Scrum Master Fosters communication Jira tool and its features Meetings allow to keep track on the project Organization to deliver results Time saving Transparency between everyone involved Enables information accessing and storage

5.3.4 Opinion about the methodology

All interviewees agreed that this methodology is helpful, and they like to work with it.

In terms of the feeling of examination by the continuous evaluation and contact with Agile, the majority said that they do not feel that. Although some mentioned that they feel examined not due to the methodology itself but because of a manager or colleague: “(...) I don't think the methodology will do a micromanaging, but if the person's that it doesn't have to be the manager because, for example I could have been working with someone that is not my manager but that person has a micromanaging way of working. (...) I felt this but not due to the tools, but due to the way of working of people”.

About the notion of the role all agreed that they know what is expected from them and what they have to do. One of the respondents claims that:

“(...) I know exactly where I fit in terms of the technologies that I work, the area that I work on. So, it's really clear to me which... which like person I need to focus more on in terms of depth, because of the things that have direct impact on me, on my work”.

5.3.5 Teams dimension

If the teams get bigger, this methodology continuous to be suitable to be applied for great part of the interviewees, as it probably needs some arrangements because it would be more people participating and this would imply a good strategy and a lot of organization, once “(...) the

larger the team, the longer these meetings will be and it may be difficult to place them like as our schedule as we are doing now (...)”.

However, when the team is larger it is complicated to discuss during the meeting topics that are interesting for everyone and that are part of everyone’s job. This was mentioned as a constraint of working within this method. The majority manifest that the size has implications in attention during meetings. One example of this struggle is given by an interviewee that reports that “(...) not everything is relevant to everyone (...) Still, there is, we make this appeal that at least for these meetings it would be good to have the people in so that they know what is being worked on also within other (...)”.

As the team increases, several respondents share the opinion that it is possible for people to continue to share their feedback, as long as “(...) it's well organized, it's possible to keep all that keys like feedback and communication ongoing okay.”. Although, one of them calls the attention to the risk of not being possible to provide it. For making sure that this does not happen, the same person, also states that the methodology provides “(...) a way to assure that people are there, and the people listen to what you have to say to get this immediate response for this immediate feedback.”.

5.3.6 Agile contribution to short the distance in remote environment

All the interviewees agreed that Agile contributes to short the distance between team members working in dispersed locations, by giving some main reasons.

One of the reasons given by most of the respondents is the continuous communication that is promoted and enabled by this approach. In the opinion of one participant:

“(...) the communication tool and even the feedback tool that Agile provides is basically a very useful tool to such teams where they are working apart, and yeah, basically all this organization provided by the Agile methodology helps the communication and the... the interaction process with people that are not located in the same site as you.”.

Another reason given was the fact that meetings allow to share feedback, as for example:

“(...) the Agile framework sets time for a lot of events like the daily standups, the retrospectives, the grooming sessions, the reviews and the retros and the plannings. So all these events, it's another way of the people of the team to get together and to provide updates or to provide any struggles, any blockers and to solve them as soon as possible.”.

6 Discussion

Literature review showed that working within a remote environment, employees can be more productive and focused (Popovici & Popovici, 2020). This research results shown that Agile can support it, giving a structure for workers to be more precise in their work enhancing concentration, providing the necessary tools and structure.

When working remotely from different locations, it was mentioned that there is a risk of not entirely guaranteeing the accurate expertise as well as the company's culture (Popovici & Popovici, 2020). For the share of knowledge, the interviewees said that it is possible to maintain it due to existent documentation, constant communication, cooperation and feedback. At the same time, the workers said that it is also dependent on some aspects, as it is important for the employee to have a good onboarding and a safe environment, and it requires active participation of the Agile master to promote the exchange of know-how. One interviewee also mentioned that it is dependent on the worker's approach.

Considering the company's culture, it was also stated that the physical distance does not allow to keep the culture. However, results suggest that is possible to maintain it, as it is important that teams make their own efforts and initiatives to encourage it, and the organization should provide the necessary environment. An existent match between the employee's values and the company's values can also facilitate the maintenance of the culture.

Regarding the workers feedback about remote work, the results showed that it is also possible to keep it, but some considerations were drawn. The team members should have the same working approach despite being working in different locations. It is also needed to find creative ways to retain people's attention during the meetings. The attribution of a buddy is a relevant technique to be performed during the onboarding process. Although, the workers' feedback is also in risk of being affected, because the comprehension of other's visions is compromised by the distance.

The findings provided more insights concerning the factors that are negatively impacted by remote work. Workers' culture is an aspect that can be negatively influenced by operating from different locations, due to people not being used to a different culture from their own or even a different way of working and being of the colleague from a different nationality. The time zones were another identified factor compromised, caused by the employee's interactions from several places of the world. The lack of personal relationship within this working approach originates a low engagement with the stakeholders. Also, not understanding the colleagues' language due to their accent can affect communication.

Results confirm previous studies showed that the team spirit can be challenging to maintain when working from home (Ozkan et al., 2022). One of the reasons is the difficulty in creating interpersonal connections when colleagues do not share the same physical space. Respondents prefer the hybrid approach because it allows team members to interact on-site some days of the week, helping to foster the team spirit.

Concerning Agile methodology this approach is preferably suitable for smaller teams and that produce outcomes in teams operating from the same location (Uludag et al., 2018). This

research results shown that team's size is not a problem, even when the team increases. In this situation, some adjustments may be required, as in the case of having more people in the meetings, there is a need to assure that everyone is listened and that they have time to share their opinions. Even for this, Agile is enabling a way for people to keep track on what is being discussed. It is important to notice that the size has a negative impact on people's attention during the meetings, as not all the topics are relevant. Also, results show that the methodology is applicable for groups operating in different places, as it provides tools and a structure based on constant communication and feedback that allows to articulate the different team members.

The outcomes of this study enable identifying the different reasons for choosing Agile, which are the following:

- Being able to prioritise topics;
- Being used in other departments;
- Being able to control the time to finish the project;
- Enable the share of feedback between the team;
- Having a safe space to fail early;
- Team's location;
- Not knowing the project scope;
- Agility to adapt during the project;
- Knowing well the role within the team and the project purpose;
- Foster transparency between everyone involved;
- Being able to foster cooperation between team members;
- Simple use of the methodology;
- Being able to perform tasks division.

Regarding Agile's implementation, it was mentioned by practitioners that one challenge to it consists of some resistance by the people to change to this method, which can also be originated by some micromanagement feeling, that can lead to uncertainty of their role (Kalenda et al., 2018). The results demonstrated that the human resistance can be one of the factors that may affect the establishment of Agile, but is not the only one. The silo mentality can also cause some constraints as people tend to be focused on their own work. Extant literature stated that if a project is planned to occur for a considerable period, modifications in the working groups in terms of elements should be considered (Coram & Bohner, 2005). This ends up being backed by the findings, as the respondents also identify the change of management as an aspect that can affect the implementation. Another important constraint was workers' lack of knowledge regarding the methodology and the necessary time to adapt to it. Not knowing the project's scope and its complexity, are also aspects that should be considered when planning an implementation as this. Regarding the examination feeling, some people have already felt that but not due to the methodology itself, but because of other people's way of working. Previous literature referred that all the intervenient must be aware of their tasks and their position in the team and project (López-Martínez et al., 2016). This is supported by the results in which all the

respondents stated that they know well their role and what is expected from them. It was consensual among all that they like to work within this methodology.

Previous research pointed out that to establish Agile it is important to understand if the organization's values match with the methodology, and also having in consideration the human factor (López-Martínez et al., 2016). The findings corroborate that, as it is relevant to choose the more suitable people to work every day with this approach. Concerning the organization's values and its alignment with the Agile methodology, it was not directly evaluated, however, the results shown that one of the reasons for choosing Agile was based on a previous identification of its use in other departments within the organization.

Besides the constraint of having more people in the team and its complications in the meetings, that was mentioned in this section, other difficulties also emerged. Still within the meetings, findings also shown that the content is sometimes not interesting, and, in some cases, there are too many meetings. They can also be too short in terms of time, if there are lots of people to discuss or they can take too long, if they are not well organized. The lack of confidentiality feature and the considerable amount of time to perform the tasks were also mentioned as barriers to the methodology. Also, understanding Agile's dynamic can be a struggle.

In this chapter, it was already referred some benefits of Agile, as the agility of the method itself, the contribution to increase productivity, the enabler factor for instigate feedback, cooperation and communication, its meetings and the fact that allows to save time. Moreover, this method also facilitates the complex problems definition, it apports the value of having a Scrum Master leading and coordinating the project, it enables relevant tools as Jira (which promotes the articulation of the several members), it consists of an organized way to deliver results, empower transparency between everyone involved and permits to storage and access to valuable information for the projects.

This method can prevent losing time during the project, and saving time and money (Coram & Bohner, 2005). Results show that, once the methodology allows the tasks to be performed faster and due to its agility, that enables to adapt the work during the development of the project. Agile is a method that fosters cooperation among the several stakeholders (Coram & Bohner, 2005). This was also highlighted in the findings, once the tools that methodology provides, the existent meetings within it, allow people to keep track on each other's work.

The outcomes of this research have shown that the methodology studied contribute to mitigate the distance between team members working from different places.

7 Conclusion, limitations and future work

7.1 Conclusion

This project consisted of understanding in which way Agile methodologies can be implemented in geolocated departments, as well as which factors influence that process.

In the beginning of this dissertation, it was defined three research questions that would then help to draw conclusions regarding the initial purpose of this paper.

- *RQ1* – Are Agile methods suitable to address and mitigate the organizations' challenges?

Considering accurate expertise and company's culture as organization's challenges, the methodology can address those constraints by providing the necessary resources and procedures for that.

Due to constant meetings and initiatives, it promotes the maintenance of the company's culture, by aggregating the employees to interact between each other, and ensures the share of accurate expertise, once team members are in constant contact, independently of the place from which they are working from.

- *RQ2* – Which factors may impact Agile methods' successful implementation?

For Agile to be successful, there are several aspects to consider, which can influence the methodology. The uncertainty of the project's scope and its complexity are two factors that can impact the method, as some projects involves a lot of different stakeholders and topics, and full dimension is sometimes not clear at the beginning.

The silo mentality as well as the human resistance to change to this method, are also aspects that can negatively impact the success of it, once the human factor and the mindset of working for its own are two realities that teams need to deal with.

The dimension of the teams can also produce some effect on the methodology, once the team increases, more topics are being discussed and it is difficult to maintain full attention during the entire reunion.

- *RQ3* – How can Agile methodologies be successfully implemented in a department with workers located in disperse locations around the world?

Results suggest that Agile can be implemented in a department with elements working in disperse sites, by promoting a constant communication and feedback regarding the work development in the project.

Apart from that, there are several tools, techniques and meetings that help to reduce the distance allowing information sharing and the integration of new members.

This method produces a set of benefits that promotes results delivery, as it is the case of the Jira tool, the transparency that is promoted between everyone involved and the importance of the Scrum Master in aggregating all the parts and guarantee that the project is moving forward.

Importantly, is necessary to maintain the team's spirit, as it brings colleagues together and improves communication between them. For this, it is recommended that teams adopt a hybrid approach, and meet in-person at the office as many times as possible. If this is not feasible, there are other ways that can help to promote the team spirit, for example online initiative that enables people to engage with each other.

7.2 Limitations and future work

The present study and its findings contain some limitations that are important to be evidenced.

The collection of data was done considering only two departments within a single company, which means that involving more departments or even other relevant companies could have enriched it in terms of diversity of answers.

Also, it could have been interesting to interview other actors, for example members from non-Agile teams, that do not have this methodology implemented in their teams but interact with the departments studied. This could have had demonstrated a distinct perspective of the approach that was investigated.

The group of interviewees is constituted by employees from the same country that can meet in the same physical space. This may have had an influence on the perception of the interviewees regarding the remote work.

The sample size is small, which was not the initial intention, but the time that this project was being developed, the company was going through a process of selling and most of the people initially invited to participate were not available, since other issues were more important within the organization's context.

The previous mentioned limitations also represent some possibilities to consider for future studies on this thematic. It can be interesting to study more departments, especially including elements that are not directly working with this method, to have more opinions of the theme from different angles. Establish correlation between Agile and non-Agile groups to evaluate the disparities. Another opportunity for research would be studying team members that are placed in different countries.

References

- Adhabi, E., & Blash Anozie, C. (2017). Literature Review for the Type of Interview in Qualitative Research. *International Journal of Education*, 9(3), 1–11.
- Alamri, W. A. (2019). Effectiveness of Qualitative Research Methods: Interviews and Diaries. *International Journal of English and Cultural Studies*, 2(1), 65–70.
- Boodhoo, R., & Purmessur, R. D. (2009). Justifications for qualitative research in organisations: A step forward. *The Journal of Online Education*, 1–7.
- Butt, S. A., Misra, S., Anjum, M. W., & Hassan, S. A. (2021). Agile Project Development Issues During COVID-19. *Lean and Agile Software Development: 5th International Conference*, 59–70.
- Ciric, D., Lalic, B., Gracanin, D., Tasic, N., Delic, M., & Medic, N. (2019). Agile vs. Traditional approach in project management: Strategies, challenges and reasons to introduce agile. *Procedia Manufacturing*, 39, 1407–1414.
- Coram, M., & Bohner, S. (2005). The Impact of Agile Methods on Software Project Management. *12th IEEE International Conference and Workshops on the Engineering of Computer-Based Systems (ECBS'05)*, 363–370. <https://doi.org/10.1109/ECBS.2005.68>
- Costa, M. A. da S., Susak, T., & Haluga, V. (2022). Economic and Social Development (Book of Proceedings), 78th International Scientific Conference on Economic and Social Development (p.206), 24-25 February 2022, University of Aveiro, Aveiro, Portugal. ISBN: 9771849754003.
- Hamouche, S. (2023). Human resource management and the COVID-19 crisis: Implications, challenges, opportunities, and future organizational directions. *Journal of Management & Organization*, 29(Issue 5), 799–814.
- Kalenda, M., Hyna, P., & Rossi, B. (2018). Scaling Agile in Large Organizations: Practices, Challenges and Success Factors. *Journal of Software: Evolution and Process*, 30(10), 1–25.
- Kerzner, H. (2018). *Project Management Best Practices: Achieving Global Excellence* (4th ed.). John Wiley & Sons, Inc. (pp. 1-55), Hoboken, New Jersey.
- López-Martínez, J., Juárez-Ramírez, R., Huertas, C., Jiménez, S., & Guerra-García, C. (2016). Problems in the Adoption of Agile-Scrum Methodologies: A Systematic Literature Review. *4th International Conference in Software Engineering Research and Innovation (CONISOFT)*, 141–148.
- Marshall, G. W., Michaels, C. E., & Mulki, J. P. (2007). Workplace isolation: Exploring the construct and its measurement. *Psychology and Marketing*, 195–223. <https://doi.org/10.1002/mar.20158>
- Ng, P. M. L., Lit, K. K., & Cheung, C. T. Y. (2022). Remote work as a new normal? The technology-organization-environment (TOE) context. *Technology in Society*, 70, 1–8.

- Ozkan, N., Erdil, O., & Gök, M. ,Sahin. (2022). Agile Teams Working from Home During the Covid-19 Pandemic: A Literature Review on New Advantages and Challenges. In *Lean and Agile Software Development* (Vol. 438, pp. 38–60). Springer Nature Switzerland.
- Popovici, V., & Popovici, A.-L. (2020). Remote work revolution: Current opportunities and challenges for organizations. *Ovidius University Annals, Economic Sciences Series*, 468–472.
- Queirós, A., Faria, D., & Almeida, F. (2017). Strengths and limitations of qualitative and quantitative research methods. *European Journal of Education Studies*, 3(9), 369–387.
- Raharjo, T., & Purwandari, B. (2020). Agile project management challenges and mapping solutions: A systematic literature review. *Association for Computing Machinery*, 123–129. <https://doi.org/10.1145/3378936.3378949>
- Rahman, M. S. (2017). The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language “Testing and Assessment” Research: A Literature Review. *Journal of Education and Learning*, 6(1), 101–112.
- Sokolic, D. (2022). SOKOLIC, Danijela. Remote work and hybrid work organizations. *International Scientific Conference on Economic and Social Development (Book of Proceedings)*, 78th, 202–213.
- Stuckey, H. L. (2013). Three types of interviews: Qualitative research methods in social health. *Journal of Social Health and Diabetes*, 1(2), 56–59.
- Syed-Abdullah, S., Holcombe, M., & Gheorge, M. (2006). The impact of an agile methodology on the well being of development teams. *Empirical Software Engineering*, 11, 143–167.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 27–43.
- Uludag, Ö., Kleehaus, M., Caprano, C., & Matthes, F. (2018). Identifying and Structuring Challenges in Large-Scale Agile Development based on a Structured Literature Review. *IEEE 22nd International Enterprise Distributed Object Computing Conference (EDOC)*, 191–197.
- Vartiainen, M. (2024). Introduction to hybrid work. In *Flexible Hybrid Work* (pp. 1–4). Edward Elgar Publishing.
- Wontorczyk, A., & Rożnowski, B. (2022). Remote, Hybrid, and On-Site Work during the SARS-CoV-2 Pandemic and the Consequences for Stress and Work Engagement. *International Journal of Environmental Research and Public Health*, 1–22.
- Zelkowitz, M. (2004). *Advances in computers: Advances in software engineering* (Vol. 62). Elsevier (pp. 12-81).

Project's contribution for the Sustainable Development Goals (SDGs)

Considering the seventeen sustainable development goals and the current project, it is possible to identify one goal that can benefit from the work developed throughout this thesis, which is the third goal: Ensure healthy lives and promote well-being for all at all stages.

Even though Agile methodologies and the findings related to it in this study does not fit in any specific target within any of the goals, in the third goal it is possible to stablish a relation between the Agile benefits and the quality of life of the employees.

The author Syed-Abdullah et al. (2006) mentions that as the project advances, the levels of anxiety of team members decline, once it is possible for teams to share and experiment the work that is being developed at any stage. The possibility of dividing the work into different segments, also allows to foster their interest during their tasks.

As it was possible to conclude by this research, Agile allows a constant communication and feedback between colleagues, contributing to the exchange of the work status. Also, the structure and mechanisms provided by this method, enables teams to break down the big project into minor portions. The current dissertation allowed to prove these benefits that contributes to promote healthier lifestyles and better contentment for employees.

APPENDIX A: Interview guide for senior profile

Interview guide

Questions

1. **How did you choose the agile methodology? What factors are more important when considering a work methodology?**
2. **What factors do you think influence Agile method implementation? Do you identify any challenges during its implementation?**
3. **What are the challenges of working with non-agile teams?**
 - Interactions , impact on functionality
4. **What are the challenges of working with other stakeholders?**
5. **Do you like working with this methodology? Why? Do you know well your role, have you ever felt a feeling of examination**
6. **In your opinion what are the benefits of an Agile environment?**

Do you think that Agile environment fosters the communication and the cooperation between team members?
7. **What do you think are the impact of team's dimension on the methodology?**
8. **In your opinion what are the challenges of team members working in dispersed locations?**

Is it possible to assure that accurate expertise and company's culture are maintained?
9. **Do you think that Agile methodology contributes to short the distance between team members in a department working in different sites?**
10. **In your opinion, is there any tool or process that you think that is missing for this methodology to be more complete?**

APPENDIX B: Interview guide for junior profile

Interview guide

Questions

- 1. If you were deciding the type of working methodology to implement, would you choose Agile? What factors are more important when considering a work methodology?**
- 2. What factors do you think influence Agile method implementation? Do you identify any challenges that could appear in its implementation?**
- 3. What are the challenges of working with non-agile teams?**
 - Interactions , impact on functionality
- 4. What are the challenges of working with other stakeholders?**
- 5. Do you like working with this methodology? Why? Do you know well your role, have you ever felt a feeling of examination**
- 6. In your opinion what are the benefits of an Agile environment?**

Do you think that Agile environment fosters the communication and the cooperation between team members?
- 7. What do you think are the impact of team's dimension on the methodology?**
- 8. In your opinion what are the challenges of team members working in dispersed locations?**

Is it possible to assure that accurate expertise and company's culture are maintained?
- 9. Do you think that Agile methodology contributes to short the distance between team members in a department working in different sites?**
- 10. In your opinion, is there any tool or process that you think that is missing for this methodology to be more complete?**

APPENDIX C: Informed consent



CONSENTIMENTO INFORMADO

Estamos a solicitar a sua participação para um estudo no âmbito de dissertação de Mestrado em Engenharia de Serviços e Gestão, da Faculdade de Engenharia da Universidade do Porto, com o tema “Identify a work methodology within a context of a geolocated department”.

Este estudo tem como objetivo avaliar se as metodologias agile produzem benefícios em departamentos que operam em locais dispersos.

Estas entrevistas serão gravadas para possibilitar a sua transcrição e análise aprofundada. Só iniciaremos a gravação após a sua concordância, expressa através da assinatura deste consentimento informado.

A informação recolhida é estritamente confidencial e será apenas utilizada no âmbito deste estudo. Os resultados serão reportados de forma agregada, sem identificar individualmente os entrevistados. Se no decorrer do estudo e do reporte dos resultados for relevante citar de forma não anónima um excerto da entrevista, tal só será efetuado após pedido por parte dos investigadores e autorização expressa por escrito por parte do entrevistado.

A sua participação neste estudo é voluntária, pelo que a poderá interromper a qualquer momento. Nesse caso toda a informação recolhida até ao momento será inutilizada.

Data/...../.....

Assinatura do investigador

Data/...../.....

Assinatura do entrevistado
