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Successful teamwork amongst geographically dispersed teams

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Summary

This study explores the feasibility and conditions under which geographically dispersed teams can effectively collaborate and find enjoyment in their work within the IT sector, particularly in the context of project-based team structures. The research is based on a literature review and an empirical study conducted at ARHS Developments, a company specialising in the development of complex web applications. Crucial factors contributing to the success of dispersed teams encompass trust, communication, leadership, technology, and process.

The empirical investigation reveals two main team configurations: the siloed approach and the integrated approach, each presenting their own merits and drawbacks. The findings emphasise the significance of trust, communication, leadership, technology, and individual differences in establishing successful dispersed teams. The study also underscores the ongoing relevance of geographical distance and the necessity for further enhancement in socialisation and coaching/learning aspects.

A “cookbook” has been developed, offering managers with 33 practical tips to foster efficient and enjoyable work environments for dispersed teams. The findings bear important implications for the IT industry and beyond, delivering insights on how to optimise team performance and satisfaction in a geographically dispersed setting.

Foreword

The choice to investigate the subject of geographically dispersed teams in the information technology (IT) industry stems from my personal experience of working in dispersed teams for the past five years. This way of working has presented numerous challenges and opportunities, and my varied experiences with different teams have led me to question the efficiency and overall enjoyment of remote work compared to working with colleagues on-site. This study delves into the complexities of dispersed team settings, aiming to identify the factors that contribute to the success and well-being of such teams, as well as offering insights for effective management.

Throughout the research process, I encountered various difficulties, such as navigating the vast body of literature on the subject and reconciling differing perspectives. However, these challenges provided valuable learning opportunities and served to enrich my understanding of the topic.

I am deeply grateful for the support and guidance provided by several individuals during this work. I would like to express my heartfelt appreciation to my supervisor, Evelyne Léonard, who diligently reviewed my work chapter by chapter, offering insightful comments that inspired critical thinking. The employees and management of ARHS Developments deserve my gratitude for generously sharing their time, experiences, and insights. I also extend my thanks to my peers and colleagues for their constructive feedback and encouragement.

I am incredibly thankful for the unwavering moral support provided by my mother, who has helped me with everyday tasks, freeing up time for me to dedicate to this research. My partner also deserves special recognition for the mutual support we provided each other during this intense period of juggling a master's degree alongside our professional lives.

In the following pages, you will find an in-depth exploration of the factors that contribute to the success and satisfaction of geographically dispersed teams in the IT industry. I hope that this work will not only contribute to the existing body of knowledge on the subject, but also provide practical guidance for managers and team members navigating the dynamic landscape of dispersed teams.

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Introduction

Problematic. In an increasing number of companies, team structures have evolved, leading to teams being spread over various offices located in multiple cities or even different countries (P. Hinds & Kiesler, 2002). As a result, the members of the teams rarely or never meet each other physically face-to-face. Yet these teams are expected to work together efficiently to achieve a common goal, namely the success of the project.

Such geographically distributed teams, also known as "dispersed teams", will be studied in the context of the information technology (IT) industry in this master thesis. More specifically, the objective is to address the following research question: is it possible to make people who are geographically apart work effectively together as a team and enjoy doing so? If so, under what conditions?

The analysis will be structured around the following key questions, which are considered essential to understand the topic:

- What is a dispersed team and what are its characteristics?
- What are the specificities and challenges faced by dispersed teams?
- Why opt for a dispersed team approach? What are the advantages and disadvantages of this choice?
- What barriers and enablers exist for such a team setup?
- How to manage a dispersed team effectively? What are the implications for management and what strategies can be used to ensure success?

Additionally, at least the following themes have been selected to study the concept of dispersed teams from various perspectives: team spirit, knowledge sharing, discrepancy in team maturity or skills, working methods, power disparities and modes of communication.

This study will also briefly address how cultural differences affect this working mode, although it is not its main focus.

Context. As stated earlier, I will conduct this study within the context of the IT sector and, specifically, within the framework of a project-based team structure: each team is assigned to a specific project and is made up of the various roles required to construct the product (analyst, developer, team leader, tester, etc.) – in line with "agile" project management methods, i.e., the team is said to be cross-functional. The team's members are spread over two to three sites in Europe, and they are each accountable for the project's success and the quality of the final product. Typically, a project team size ranges from 5 to 15 persons.

This corresponds to the organisation set up in the firm ARHS Developments, where the empirical study will take place, as will be described below. It is a company, based in Luxembourg, which develops so-called "complex" web applications for major clients, primarily in the public sector, but also working with those in the private sector.

Interests of the study. The topic under discussion is particularly relevant in today's context as an increasing number of companies are adopting this team structure for various reasons. For instance, the required expertise for a project's success may be available only in specific locations, or employing personnel from overseas could be significantly more cost-effective than hiring locally. Being in close proximity to customers is another factor that drives this decision. Using dispersed teams also enables a company to expand by opening new offices in foreign locations while facilitating knowledge-sharing and maintaining the organisation's culture through the work.

Hence, many workers engage in daily work in dispersed teams and encounter the related difficulties. Stories of these experiences sometimes depict catastrophic failures, while others describe extremely positive and successful situations.

With this work, I intend to answer the research question and, if it turns out to be positive, to offer some workable solutions to assist these dispersed teams.

Next to this, it is undeniable that geographically distributed work is a popular issue in the post-Covid era. Teleworking is becoming more and more common, particularly in the IT industry, and some of the findings from this study could potentially apply to this emerging work paradigm.

Plan of the master thesis. This work is structured as follows:

- **Introduction.** The goal of the current chapter is to provide an overview of the research problem and its context, setting the foundation for the study. It describes the importance of the research topic and outlines the key themes that will be covered in subsequent chapters.
- **Chapter 1 – Theoretical part.** This chapter will explore the scientific literature available on the subject and give an overview of the authors' positions. The aim of this review is to draw out the variables that will have an impact on dispersed team's performance and success; this will help to clarify the research area to focus on in the empirical phase.
- **Chapter 2 – Empirical part.** This chapter presents the empirical study conducted for this master thesis in detail. The methods used to collect information are discussed, followed by an analysis of the concepts from the theoretical section based on participant responses. This analysis will shed light on the factors that influence the functioning of dispersed teams. Additionally, this chapter will include a practical "cookbook" containing 33 tips for effectively managing dispersed teams.
- **Conclusion.** This final chapter presents the key findings and attempts to answer the research question. It synthesises insights from both the literature review and empirical investigation, revealing the importance of trust, communication, leadership, and individual differences for successful and enjoyable dispersed teams. The chapter also discusses the implications of these findings for the broader field of study and the potential for future improvement in socialisation and coaching/learning aspects.

Chapter 1. Theoretical part

The purpose of this chapter is to offer a thorough understanding of dispersed teams and unveil the key factors that drive their success, as supported by scientific literature. Through six distinct sub-sections, we will explore various aspects of dispersed teams, including their definition, benefits and drawbacks, attributes of high-performing teams, factors influencing effectiveness, methods to promote effectiveness, and strategies for selecting members.

By the end of this section, readers should be better equipped with the necessary knowledge and tools to build and manage effective dispersed teams.

1.1 Definition of a dispersed team

Let us paint a picture of a dispersed team: a group of people working towards a common goal, but separated by various boundaries (P. Hinds & Kiesler, 2002). These boundaries can take on various forms, such as physical distance (geographical dispersion), different time zones (temporal dispersion), distinct cultural backgrounds (cultural dispersion), varying organisational affiliations (organisational dispersion), and the distribution of team members in sub-groups across different sites in a balanced or unbalanced manner (configurational dispersion). These dimensions are summarised in Figure 1.

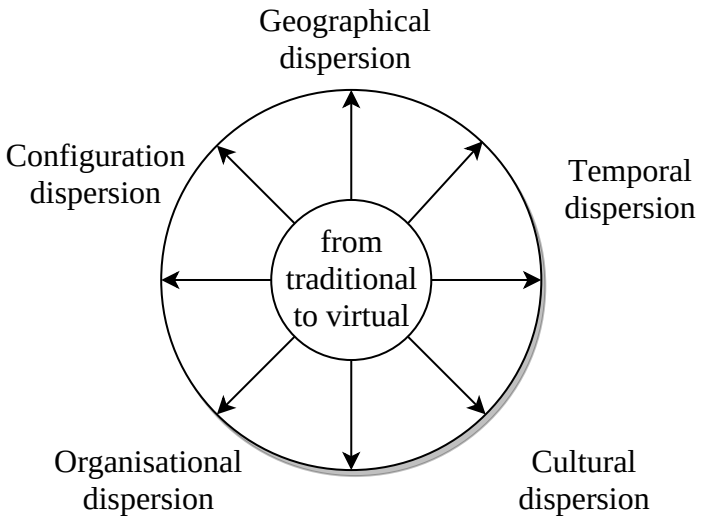

Figure 1. Dimensions of dispersed team. Adapted from (Zigurs, 2003).

A dispersed team may exhibit one or multiple dimensions of dispersion. The more dimensions of dispersion a team presents, the more virtual and complex it becomes, which in turn increases the hurdles it must clear to function effectively (Zigurs, 2003). In fact, some might say that a highly dispersed team is like a Rubik's cube, with its myriad pieces requiring careful coordination and alignment to achieve the desired outcome. These dimensions and their impacts on the performance of dispersed teams will be further explored in section 1.4.

This type of team is frequently referred to by other names in the literature, such as distributed

teams, virtual teams, or remote teams. Although these terms may have slightly different interpretations depending on the source, they generally overlap in meaning. Distributed teams, for example, tend to be similar to dispersed teams, while virtual teams emphasise the use of communication technology to complete tasks (Fang et al., 2022; Lipnack & Stamps, 1997). Remote teams, on the other hand, are defined as a group of people who work from different locations without a shared physical workspace (Porter & Lawler, 1968), focusing more on the absence of a common office rather than on geographical distance between members.

The definitions given above allow us to list the essential characteristics of a dispersed team as being (a) a group of individuals working on tasks that are interdependent and oriented towards a common objective, (b) distributed in terms of space, time or other dimensions, and (c) dependent on communication and information technology (ICT) to complete their tasks. In this work, the terms dispersed team, distributed team and virtual team will be used interchangeably to refer to this concept.

Wong & Burton (2000) go further and highlight three key characteristics of a virtual team. They define the first characteristic as the *virtual team context*, which is marked by the absence of prior collaboration, the presence of non-routine tasks, and members located in different parts of the world. The second characteristic is the *virtual team composition*, which often includes culturally and organisationally diverse members. The third and final characteristic is the *virtual team structure*: the relationships between members tend to be horizontal but weak due to the absence of prior relationships and the nature of their work. A virtual team may present some or all of these characteristics. According to the authors, the design of a team must consider two essential factors: the tolerance for errors and the volume of coordination. The optimal composition of the team, whether it should exhibit none, some, or all of the virtual team characteristics previously described, will depend on these two factors.

The features outlined by Wong & Burton are particularly relevant for a specific type of distributed teams studied in their research, which are composed of experts from various regions around the world brought together to tackle a specific issue. These teams are typically short-lived and disband once the task is completed. This type of distributed team was a common subject in scientific literature in the last decade of the 20th century (Meyerson et al., 1996). However, there is another type of virtual team known as *distributed work groups*, as defined in (Julsrud, 2008), which consists of individuals from different geographical locations within the same organisation. These teams are usually more permanent and work on ongoing projects. For the distributed work groups, which will be the main focus of this master thesis, the characteristics outlined by Wong & Burton are less relevant.

Having presented the definition of dispersed teams and its characteristics, the next step is to examine why dispersed teams are becoming more popular among companies around the world.

1.2 Advantages and disadvantages of a dispersed team

In this section, we will explore the various reasons why organisations opt for dispersed teams, their advantages over other collaboration methods, and the challenges they face for effective functioning.

Organisations are increasingly relying on dispersed teams as a way to grow, restructure, and quickly adapt to changing market conditions (Silveira Reis et al., 2022). One of the key benefits of dispersed teams is the access to a larger pool of talents (Bergiel et al., 2008), as companies can now hire the best individuals from any location. This allows the assignment of the most qualified team members (Wakefield et al., 2008). The diverse composition of dispersed teams also leads to a wider array of perspectives and ideas, which can result in more innovative solutions to problems (Majchrzak, A. & Malhotra, A., 2006).

Increased flexibility is another advantage offered by dispersed teams. They can work from any location and at any time, providing greater flexibility for both employees and the company. Such teams also facilitate around-the clock work (Wakefield et al., 2008). This contributes to the success of the organisation as it allows for quicker response times and a more dynamic work environment.

Besides these advantages, dispersed teams can lead to reduced overhead costs as companies no longer need to incur expenses on maintaining a physical office or employees' commuting expenses (Deeb, 2020). This cost savings can then be used to support other areas of the business, allowing it to expand and stay competitive. It is important to note that this benefit is limited to remote teams. In the case of dispersed teams, each team member usually has a designated workspace they can (or must) work from. Furthermore, this team structure can provide an opportunity for companies to lower the overall team cost by hiring employees from low-cost labour markets located abroad.

Next to these advantages, there are several drawbacks associated with dispersed teams. One of the most notable challenges is the communication barrier (P. J. Hinds & Mortensen, 2005; O'Leary & Cummings, 2007). Effective communication can be difficult when team members are located in different geographical locations, as factors such as language barriers, time zone differences, and technological limitations can hinder clear and timely communication.

Another concern is the lack of trust and cohesion. The absence of regular face-to-face interaction can make it difficult to build trust and establish a sense of camaraderie among team members, leading to decreased cohesion and feelings of disconnection (Jarvenpaa & Leidner, 1998; Panteli & Tucker, 2009). Similarly, dispersed team members may feel less connected to their team or organisation, resulting in weaker identification and commitment (C. Gibson & Gibbs, 2006; Wiesenfeld et al., 2001).

These issues with communication and trust can negatively impact collaboration and coordination. Coordinating tasks, setting deadlines, and monitoring progress can be more

challenging in dispersed teams due to time zone differences and reduced visibility (Cramton, 2001; Espinosa et al., 2007). Remote managers, in particular, may struggle to assess team member performance and provide timely, constructive feedback (Espinosa et al., 2007; Sarker et al., 2011).

Lastly, remote teams may miss out on the benefits of informal interactions, such as spontaneous conversations and social bonding. This can result in feelings of isolation and diminished opportunities for knowledge sharing and relationship building (Kraut et al., 2002; O'Leary & Cummings, 2007).

In conclusion, dispersed teams offer numerous advantages to organisations, such as access to a larger talent pool, increased flexibility, and reduced overhead costs. However, the effective functioning of dispersed teams can be impeded by several challenges, including communication barriers, trust and cohesion issues, and difficulty coordinating tasks and monitoring progress. Those pros and cons are summarised in Figure 2 below. Organisations must consider both the advantages and drawbacks of dispersed teams when deciding on their team structures to ensure their effectiveness and success.

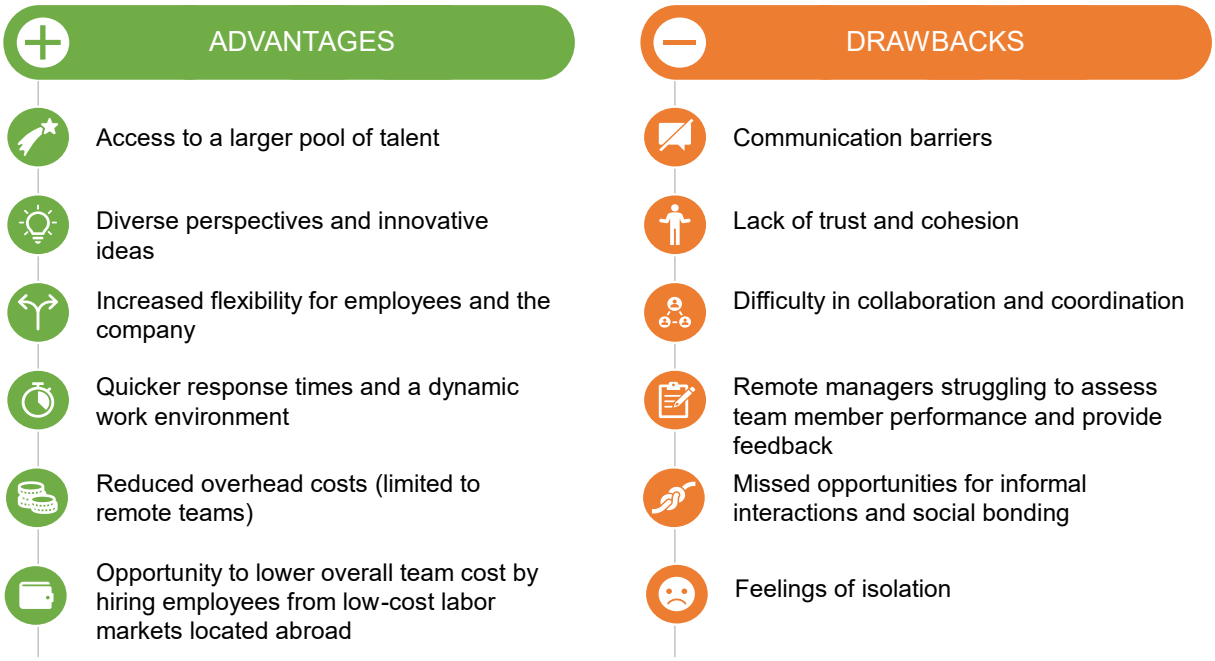

Figure 2. Closer look at dispersed teams: advantages and drawbacks.

1.3 Key characteristics of a high-performing team

The purpose of this section is to identify the essential characteristics of high-performing teams, which will be referred to again in the next section when exploring the impacts of dispersed teams on team performance. The performance attributes of teams will first be listed, regardless of whether the teams are dispersed or not. The focus will then shift to distributed teams.

Collaboration is widely recognised as a crucial element for organisational success, enabling

teams to achieve superior results that are unattainable when working individually (Peters & Manz, 2007). Academic literature highlights five critical aspects of effective collaboration: knowledge and information sharing, conflict resolution, problem-solving, decision-making, and innovation and creativity (Kauffmann, 2015). When these aspects are effectively integrated into team processes, they can enhance collaboration and lead to improved overall performance.

The characteristics of a high-performing team are generally the same for both regular teams working in the same office and dispersed teams (Katzenbach & Smith, 2005). However, dispersed teams may require additional factors that are crucial for their success, such as efficient communication methods and the use of appropriate technology for remote collaboration. Scholars like Bergiel, Bergiel & Balsmeier (2008) have highlighted the significance of four key factors for dispersed team success, which include high levels of trust, clear communication, strong leadership, and suitable technology. In addition, five elements have also been identified by Boughzala et al. (2012), including leadership, people, technology, information, and process.

In the upcoming sections, we will further discuss the elements identified in this section as crucial for dispersed team success, as we explore the factors that influence and enable effective collaboration in dispersed teams.

1.4 Factors influencing dispersed team effectiveness

This section will delve into the critical factors that affect the performance of virtual teams. To provide a comprehensive analysis, we will first examine the various dimensions of dispersion, including distance, time, culture, organisation, and configuration. Indeed, we cannot view geographical dispersion as a simple spectrum ranging from physical presence to virtuality, as highlighted by O'Leary & Cummings (2007). Comparing face-to-face groups with virtual groups is no longer adequate, and we must consider the various components of the dispersion and how they interact with each other.

We will explore the negative impacts of these factors on team performance, such as communication breakdowns, reduced coordination, and challenges in establishing trust and social connections. However, it is not all doom and gloom: this section also highlights the bright side of dispersion, such as increased productivity and flexibility.

It is worth noting that, within each dimension of dispersion, the expected effects, whether positive or negative, may vary depending on the degree of dispersion (O'Leary & Cummings, 2007). For example, if team members are situated on different continents, the ability to meet face-to-face becomes highly limited, whereas if they are 200 km apart, occasional face-to-face meetings might improve team functioning overall, despite not being able to see each other every day. Similarly, real-time problem-solving capability decreases as temporal dispersion increases.

It can be challenging to distinguish between the impacts of various types of dispersion, as they often overlap with one another. While the virtual team literature typically considers their properties and effects together dispersion (O'Leary & Cummings, 2007), we will attempt to

focus on each dimension separately to explore its primary effect.

Finally, we will briefly consider the impacts of the nature of the task at hand.

It is important to note that while this section focuses on the contextual and structural factors affecting the effectiveness of dispersed teams, the role of human factors, such as management and individual behaviour, should not be overlooked. Managers are instrumental in establishing clear communication protocols, setting team goals and expectations, and nurturing a sense of shared identity and trust among team members. Individual behaviour contributes to adapting to the dispersed team environment, actively engaging in communication and collaboration, respecting cultural differences, and maintaining openness to feedback and learning. These aspects will be further explored in section 1.5, which delves into the enabling factors for the effective functioning of dispersed teams.

1.4.1 Distance

Many authors believe that geographical distance still has a negative impact on teams as it limits opportunities for informal interactions and discussions, leading to reduced communication, socialisation, and trust among team members (Bell & Kozlowski, 2002). This can lead to a decrease in the sharing of task-related information and affect coordination between team members (Kiesler & Cummings, 2002; Cramton & Webber, 2005). The lack of external social cues, such as tone of voice and facial expressions, may also hinder mutual understanding and coordination (Kiesler et al., 1984; Sproull & Kiesler, 1986). Additionally, research indicates that distance can contribute to feelings of isolation and exclusion (Cummings & Haas, 2012).

However, this does not mean that distributed teams are doomed to fail and cannot achieve the same level of performance as collocated teams. Research suggests that what really matters is functional distance, rather than geographical distance (Festinger et al., 1950). Geographical distance refers to physical separation between individuals in a Euclidean space, while functional distance refers to the likelihood of people finding themselves in the same communication space at the same time (Monge & Kirste, 1980). This includes communication channels and shared areas that enable passive contacts. Studies have shown that individuals are more likely to develop social connections with those who share functional proximity, even if physical distance is relatively large (Allen, 1977; Monge & Kirste, 1980). For instance, people living in different apartments or houses can develop strong social connections if they share communication channels like gardens or courtyards. In the context of computer-mediated communication, repeated exposure to other users can create a similar sense of familiarity and influence our preferences towards them; this effect is known as the “mere exposure effect” (Zajonc, 1968). The distinction between Euclidean and functional distance is important because it highlights the idea that members of distributed teams can establish close ties on a functional level, even if they are physically distant.

Boyer O’Leary et al. (2011) reach similar conclusions, but instead of referring to functional distance, they discuss the “perceived proximity”. Perceived proximity refers to an individual’s

perception of how close or far another person is (Wilson et al., 2008) and includes both cognitive and affective components. Physical distance between team members is found to have a weak effect on how close they feel (perceived proximity), how much they communicate, or how similar they see each other (Boyer O'Leary et al., 2011). Instead, it is the perceived proximity that has a significant impact on the relationship quality. Perceived proximity is influenced by communication frequency, which means that the more frequently team members communicate, the closer they feel to each other. Additionally, identification also plays a role in shaping perceived proximity, as individuals who share social categories such as age or location tend to feel a stronger connection and develop a shared identity.

Therefore, while geographical distance may pose challenges for distributed teams, prioritising functional and perceived proximity can help mitigate these challenges and enhance team performance. This can be achieved by leveraging appropriate communication technologies, promoting collaboration and relationship building, and fostering a sense of community and trust. Practical actions include using communication tools that encourage regular interaction (Cummings & Haas, 2012), establishing clear goals and roles, and fostering a team culture that values open communication and mutual support (Bell & Kozlowski, 2002).

Although physical distance may not be the primary factor that affects the quality of relationships in virtual teams, it is still recommended that team members meet face-to-face occasionally. Joinson (2002) suggests that bringing a team together physically is an effective way to improve communication and trust between members and enhance the team's overall connection. Even if regular meetings are not possible, an initial in-person meeting can help team members better understand and connect with each other, which is especially important since first impressions of colleagues can form quickly and persist over time, even for virtual teams (Zigurs, 2003).

1.4.2 Time

When team members are located in different parts of the world, they may be working in different time zones. Although a time difference of one or two hours may not have a significant impact on collaboration, temporal dispersion can become more challenging when team members are working on opposite sides of the world.

Studies show that temporal dispersion has both negative and positive effects on dispersed team performance. On the negative side, greater temporal dispersion can lead to communication breakdowns, which can decrease team performance in terms of speed, accuracy, and quality of task completion (DeRosa et al., 2004). When team members have limited opportunities to communicate in real-time (C. B. Gibson & Cohen, 2003), it can be challenging to clarify messages and develop mutual understanding. This can cause misunderstandings and frustrations when the team is blocked waiting for a colleague's response (Joinson, 2002).

On the positive side, temporal dispersion can have benefits for team performance. For example, team members can work on tasks around the clock, taking advantage of time zone differences, which can lead to faster completion of tasks and increased productivity (Martins et al., 2004).

Moreover, temporal dispersion can reduce distractions and interruptions, allowing team members to focus on their tasks and work more efficiently. Temporal dispersion can also provide team members with more autonomy and flexibility, which can increase motivation and satisfaction, ultimately leading to better performance (Gajendran & Harrison, 2007).

Overall, the literature suggests that while temporal dispersion can pose challenges to dispersed team performance, several strategies can help mitigate these challenges and improve team effectiveness. For instance, virtual teams can use appropriate technologies (DeRosa et al., 2004), establish clear communication protocols and goals, and schedule team meetings that accommodate the needs and timetables of all team members (Kozlowski & Ilgen, 2006).

1.4.3 Culture

The presence of individuals from various cultural backgrounds within a group or team is referred to as cultural dispersion, also known as cultural heterogeneity. Some studies have found that cultural dispersion has a negative impact on team performance, particularly when team members have different communication styles or conflict resolution strategies (P. J. Hinds & Mortensen, 2005; Maznevski & Chudoba, 2000). However, other research suggests that cultural dispersion can be positive, particularly when team members are able to leverage their diversity to come up with more creative solutions (Earley & Mosakowski, 2000; Watson et al., 1993).

To make the most of cultural dispersion, researchers have suggested a variety of strategies. Firstly, it is important to establish clear lines of communication and make sure everyone is speaking the same language, figuratively and literally (Maznevski & Chudoba, 2000). Another strategy is to provide cross-cultural training and support to team members to help them better understand and appreciate each other's perspectives (Earley & Mosakowski, 2000). And lastly, creating a sense of shared identity or "teamness" can go a long way towards promoting collaboration and breaking down cultural barriers (Maznevski & Chudoba, 2000).

1.4.4 Organisation

Organisational dispersion refers to the scattering of team members across different organisational boundaries such as companies, departments, or institutions, rather than working under the same employer or manager. Working together in these circumstances can be a daunting task, with team members struggling with different communication channels, priorities and reporting structures.

Reporting to different structures can disrupt team harmony, as team members may have conflicting priorities, objectives and decision-making powers. For example, if one team member's supervisor values revenue growth, while another's emphasised cost reduction, aligning objectives can be difficult. Moreover, with varying reporting structures, team members may face confusion about who to approach with specific queries, or who is responsible for certain outcomes, leading to miscommunication and delay (Mathieu et al., 2018).

Similarly, disparities in communication channels can result in miscommunication, leading to missed or misunderstood information if team members are uncertain about which channels to use for specific messages. Such a scenario can be cumbersome, especially when team members switch between multiple channels or duplicate messages across platforms, leading to inefficiency and frustration. Additionally, without a centralised communication channel, tracking progress can become difficult, making it challenging to ensure that everyone is on the same page (C. Gibson & Gibbs, 2006; Mathieu et al., 2018).

As with other types of dispersion mentioned earlier, the key is to establish precise communication protocols, cultivate a culture of trust among team members, and define explicit goals and performance metrics (Mathieu et al., 2018).

1.4.5 Configuration

O'Leary & Cummings (2007) introduced a type of dispersion called "configuration dispersion" which has a significant impact on team functioning but is often overlooked in the literature. Configuration dispersion refers to the distribution of team members across different sites, irrespective of spatial and temporal distances, and has three key aspects: the number of sites represented on a team, the isolation of individual members, and the imbalance between geographically defined subgroups. To measure configuration dispersion across these three dimensions and enable team comparison, the authors defined three indexes, which are presented in Table 1.

Index	Formula
Site	k = Total number of sites represented in the team (e.g., number of offices).
Isolation	Percent of team members with no other team members at their site.
Imbalance	Standard Deviation $(n_i, n_j, \dots, n_k)/N$, where k is the total number of sites represented in the team, n_i is the number of team members in the ith site and N is the total number of team members across all sites.

Table 1. Indexes and formulae to measure configuration dispersion (O'Leary & Cummings, 2007)

For instance, a team of 8 members can be distributed across 21 configurations, which can be divided into different subcategories or "clusters" as shown in Table 2. The configurations can range from those where team members are distributed across only two sites to those where most team members are on one site and a few are on peripheral or "satellite" sites. Highly dispersed configurations involve a distribution of team members across a variable number of sites.

The type of configuration affects group dynamics, which can either attenuate or amplify the existing geographical distance (O'Leary & Cummings, 2007). Even or "balanced" configurations can trigger increased intergroup relations between sites, leading to improved collaboration or solidarity, or competition or conflicts between groups (Alderfer & Smith, 1982). On the other hand, imbalanced configurations may trigger the majority-minority effect, where minority members tend to adopt the thinking and actions of the majority (Nemeth, 1986).

In extreme cases where the majority of the team is located in one site while the remaining members are dispatched to different locations (e.g., 6-1-1), the isolation of the last member may decrease awareness of their activities (Grinter et al., 1999).

Number of sites	Configuration
2	7-1, 6-2, 5-3, 4-4
3	6-1-1, 5-2-1, 4-3-1, 4-2-2, 3-3-2
4	5-1-1-1, 4-2-1-1, 3-3-1-1, 3-2-2-1, 2-2-2-2
5	4-1-1-1-1, 3-2-1-1-1, 2-2-2-1-1
6	3-1-1-1-1-1, 2-2-1-1-1-1
7	2-1-1-1-1-1-1
8	1-1-1-1-1-1-1-1

Table 2. The 21 possible configurations for a distributed team with 8 members (O'Leary & Cummings, 2007)

Therefore, the distribution of team members across sites is a critical factor to consider in managing remote teams. It is important to note that the size of the team also plays a role in the effectiveness of virtual teams, with smaller groups being less likely to experience coordination and communication problems (Cummings, 2008).

1.4.6 Nature of the task

The difficulties faced by distributed teams can vary depending on the task at hand, as supported by a substantial body of scientific literature.

One finding that has been consistently reported is that complex, non-routine tasks are more challenging for dispersed teams, while routine or well-structured tasks are comparatively easier (Bell & Kozlowski, 2008). Effective communication and coordination are critical for high performance on complex tasks (Kahai & Cooper, 2003), and the complexity of the task positively influences the need for communication and interaction among team members in dispersed teams (Hertel et al., 2005).

Task interdependence, or the degree of coordination required among team members to complete a task, is another important factor affecting the effectiveness of dispersed teams. Highly interdependent tasks make coordination and communication more challenging when team members are geographically dispersed (Kirkman & Rosen, 1999).

Literature suggests various strategies to improve dispersed team performance. These include building trust and promoting open communication (Jarvenpaa & Leidner, 1998), using appropriate technology (e.g., video conferencing, shared workspaces), and developing clear communication protocols and guidelines (Bell & Kozlowski, 2002).

1.5 Enablers of effective dispersed teams

In this section, we explore the key enablers for effective virtual teamwork, drawing from the

scientific literature on the subject. These enablers include technology, trust, and leadership. While communication is a crucial aspect of virtual teamwork, it is not explicitly addressed in its own subsection. Rather, the importance of communication will be highlighted in each of the three sections, as it is enabled through technology, leads to higher trust, and is fostered by effective leadership.

The section begins by discussing the role of technology, including its impact on communication and collaboration. We then delve into the importance of trust in virtual teams, including its two dimensions, cognition-based and affective trust, and strategies for building and maintaining it. Finally, we examine the unique challenges of leadership in virtual teams, including the need for more explicit communication, structure, and trust-building measures, and the leadership styles that have been found to be most effective in virtual settings.

Overall, this section aims to provide a comprehensive overview of the enablers critical to the success of virtual teams, including practical insights and strategies derived from the scientific literature.

1.5.1 Technology infrastructure

Effective communication in dispersed teams is widely acknowledged to be challenging, as team members must work hard to overcome the limitations of not being able to communicate face to face. As a result, technology has become a critical requirement for the successful operation of virtual teams (Horwitz et al., 2006). Fortunately, access to communication technologies has improved in recent decades, particularly in the Western world. The COVID-19 pandemic accelerated the use and adoption of communication technologies, as they became a vital means of maintaining contact with individuals outside the home during this period. Moreover, communication technology is continuously evolving, providing virtual teams with increasingly versatile and user-friendly tools.

Technology is not only a means to transport information; it is also a tool for the creation and exchange of meaning and symbolic value. It can be used to create a sense of closeness and improve the quality of the working relationship between distant team members. In other words, ICTs play a critical role in fostering social presence, which refers to the extent to which individuals feel connected and involved in social interactions with others, regardless of physical proximity (Ijsselsteijn et al., 2000).

Social presence is a key factor in successful virtual team collaboration, as it promotes a sense of belonging and mutual trust among team members. In contrast, a lack of social presence can result in damaged relationships, leading to less co-operation and more aggressive behaviour in online groups compared to face-to-face groups (Pazos, 2012). It is worth noting that social presence is closely linked to the concept of functional distance addressed in section 1.4.1: shared channels of communication and other forms of functional proximity can help individuals feel socially connected, even when physically distant, thereby reducing functional distance and promoting social presence.

Studies have shown that the use of specific symbols and language during electronic communication, such as emoticons, bold typeface, and exclamation points, helps to express emotions and maintain social presence (Jacobson, 1999; Murphy & Collins, 1997).

According to the Social Presence Theory (Short et al., 1976), the feeling of "being present" depends on the quality of the communication used, with media that has richer cues (e.g., video or audio) providing a stronger sense of social presence. This theory has been extended to computer-mediated communication (Kiesler et al., 1984; Sproull & Kiesler, 1986), which lacks non-verbal cues such as facial expressions and gestures. The research suggests that in order to enhance virtual collaboration, sophisticated technical tools and spatial metaphors should be used to compensate for the absence of non-verbal cues.

However, Ijsselsteijn et al. (2000) argue that physical and social presence are relatively independent. A medium can provide physical presence without the ability to transmit signals of reciprocal communication, such as with advanced graphical virtual reality. On the other hand, individuals can feel social presence even with applications that lack visual and graphical cues, indicating that rich detail is not always necessary for fostering social presence. Thus, using tools that are rich in detail is not necessarily a prerequisite for fostering social presence.

Furthermore, the relative media richness theory, proposed by Carlson and Zmud (1999), suggests that the effectiveness of a communication medium depends not only on its inherent characteristics but also on the context in which it is used. This context includes factors such as the user's prior experience with the medium, the communication partners, messaging topics, and organisational context. For instance, someone with extensive experience with email and established communication partners and messaging topics would consider email to offer more communication capabilities than someone who is new to the company, new to computer-mediated communication, and unfamiliar with the firm's email system.

In contrast to media richness, Dennis & Valacich (1999) introduced the concept of media synchronicity, which refers to the extent to which individuals work together on the same activity at the same time and have a shared focus. Low-synchronicity media, such as email and text messaging, are optimal for exchanging information ("conveyance"), while high-synchronicity media, such as video conferencing and in-person meetings ("convergence"), are better for developing a shared understanding. In a nutshell, the idea is that different types of communication technology are better suited for different forms of communication, and using the appropriate technology can aid effective communication in virtual teams.

Kauffmann (2015) echoes this perspective by suggesting that some communication tools are better suited for certain types of communication. ICTs can facilitate both task-based and relationship-based communication, and certain ICT channels are more appropriate for task-oriented communication, while others are more suitable for relationship-oriented communication.

Regardless of the communication tools employed, it is crucial for team members to communicate clearly about how they intend to use digital artefacts when collaborating. Failure to do so can cause confusion if individuals use the tools differently than expected (Fang et al., 2022). According to Zigurs (2003), teams should use technology as a starting point, adapt it iteratively to their needs, and develop effective and creative communication skills in evolving environments.

1.5.2 Trust

Trust plays a crucial role in the success of dispersed teams, where physical distance and lack of face-to-face interactions can make it challenging to establish and maintain relationships. Research has consistently shown that teams with higher levels of trust tend to perform better, as trust promotes collaboration, knowledge sharing, and satisfaction among team members (Paul & McDaniel, 2004). Trust enables team members to communicate openly and honestly, leading to better decision-making and task performance (Jarvenpaa & Leidner, 1998).

Trust in dyadic relationships is defined as the willingness of one person to rely on another based on the belief that the other person is competent, reliable, and has good intentions (Mayer et al., 1995), while trust within teams is a shared belief or expectation that team members will behave in ways that promote mutual benefit and co-operation (Dirks & Ferrin, 2002).

Trust can be categorised into two dimensions: cognition-based trust and affective trust (McAllister, 1995). While cognition-based trust relies on rational assessments of the competence and trustworthiness of the other (Schaubroeck et al., 2011), affective trust relies on emotional bonds between people, developed through shared experiences and social exchanges (McAllister, 1995).

In dispersed teams, team members may lack the social cues that are present in face-to-face teams, which can make it challenging to establish affective trust (Jarvenpaa & Leidner, 1998). Therefore, team members may rely more on cognitive trust to build trust. McKnight et al. (1998) support this view, stating that in virtual teams, team members tend to depend on the perceived competence and trustworthiness of their colleagues, and may also build trust based on task completion and commitment.

Research on trust in virtual teams has largely focused on temporary teams, leading to the development of theories such as “swift trust” which focuses on building cognitive trust quickly in short-term, task-focused teams (Meyerson et al., 1996). However, for ongoing teams, trust must be developed not only based on the cognitive dimension but also on the affective dimension (Kauffmann, 2015). While trust in a work environment is primarily cognition-based, long-term trust also requires the development of affective bonds (McAllister, 1995). In work relationships, the cognitive and affective dimensions of trust are often interdependent, and it has been found that affective trust is a stronger predictor of co-operation and coordination than cognitive trust (McAllister, 1995). Colquitt et al. (2007) further found that affective trust is positively related to team effectiveness, including team member satisfaction, innovation, and

productivity.

The challenge of establishing affective trust in dispersed teams has been recognised by researchers (McGrath, 1990; Warkentin et al., 1997). The process of developing trust is intertwined with the process of building a relationship (Lewicki & Bunker, 1995). Various strategies have been suggested to facilitate relationship building.

One strategy is to promote communication and information sharing among team members, as this helps to build a shared identity and understanding of each other's perspectives and strengths. It is important to establish predictable communication patterns, and teams should be proactive in warning each other in advance of communication absences (Jarvenpaa & Leidner, 1998). Furthermore, the importance of responses cannot be overstated. When someone volunteers to complete a task, it can bring the team together and make them stronger. However, the responses to these initiatives are even more critical. In computer-mediated communication, non-verbal cues and context are often lost, making it harder to understand messages. Therefore, when someone responds, it shows that they are willing to take the risk of interpreting the message and are involved in the team. This involvement can lead to attachment and affection among team members (Jarvenpaa & Leidner, 1998). Finally, team members need to explicitly verbalise their commitment, enthusiasm and optimism to reinforce the affective dimension of trust.

Creating opportunities for social interaction is another strategy to establish personal connections and increase feelings of camaraderie and trust (Kauffmann, 2015). Even in a virtual context, team members can build personal connections through informal conversations and shared experiences facilitated by ICTs. Virtual icebreakers, games, or team-building exercises can also be used to build personal connections and trust.

Effective and positive leadership is also crucial in maintaining trust (Jarvenpaa & Leidner, 1998). According to Dirks & Ferrin (2002), trust in leadership is formed through two different perspectives: the *relationship-based* perspective, which focuses on the nature of the leader-follower relationship and the perception of mutual obligations, and the *character-based* perspective, which focuses on the perception of the leader's character and how it influences a follower's sense of vulnerability. Both perspectives are relevant to virtual teams, where trust plays an even more critical role. Trustworthy leaders are perceived as reliable, competent, and benevolent, leading to higher levels of trust within the team (Mayer et al., 1995). These insights and guidelines on trust in leadership can help leaders of dispersed teams to build and maintain trust with their team members, creating an environment in which team members feel motivated and engaged despite the challenges of distance and separation. To further discuss how leadership can foster effectiveness in dispersed teams, please refer to section 1.5.3.

In addition to the previously discussed strategies, promoting trust in dispersed teams can also be aided by other factors. Research has found that consistency among team members, in terms of both their actions and their commitments, is a key factor in establishing trust (Mayer et al.,

1995). Additionally, reliability – consistently meeting obligations and fulfilling commitments – has been found to increase trust among team members (McKnight et al., 1998). Clear and well-defined role divisions among team members can also contribute to trust, as inconsistent or unclear roles may lead to a breakdown in trust (Meyerson et al., 1996).

As already mentioned in section 1.5.1, technology also plays a critical role in establishing trust within dispersed teams. The choice of communication technology can affect the development of trust in teams, with some technologies being better suited to building affective trust than others. For example, video conferencing technology can facilitate the establishment of emotional bonds, as it allows team members to see each other's facial expressions and non-verbal cues. On the other hand, email and instant messaging may be more effective in building cognitive trust, as they are better suited to transmitting information quickly and efficiently (DeRosa et al., 2004).

It is important to keep in mind that trust is a continuous process that requires ongoing effort from all team members. Trust can easily be eroded by factors such as missed deadlines, inconsistent behaviour, or failure to communicate effectively. Thus, teams should constantly work towards building and maintaining trust by implementing, among others, the guidelines provided in this section.

1.5.3 Leadership

According to Bell & Kozlowsky (2002), team leaders have two primary functions: developing team processes and monitoring ongoing performance. Effective leadership requires a balance between being task-oriented and people-oriented. Task-oriented leadership is important for managing team performance, while people-oriented leadership promotes a positive team culture and enhances employee motivation and satisfaction (Abbas & Asghar, 2010; Gray, 2004).

Leadership in dispersed teams differs from traditional face-to-face team: some of the key differences include the need for more explicit communication, for more structure and for more trust-building.

According to Bergiel et al. (2008), daily communication between a team leader and individual team members is "the glue that holds a virtual team together". Because virtual teams lack the non-verbal cues that are present in face-to-face communication, leaders need to be more explicit in their communication to ensure that team members understand each other. This includes being clear about expectations, deadlines, and goals, and establish guidelines on how to communicate (Jarvenpaa & Leidner, 1998; Ojala, 2004). Providing structure to team interactions, such as regular check-in, feedback, and a clear decision-making process, can help prevent communication breakdowns and misunderstandings (Bell & Kozlowski, 2008).

As already discussed in section 1.5.2, trust is a key factor in virtual team effectiveness, and leaders need to take extra steps to build trust among team members since virtual teams lack the same opportunities for social interaction as face-to-face teams. Trust can be built through

repeated interactions and the demonstration of trustworthy behaviours (Jarvenpaa & Leidner, 1998). Additionally, team leaders' knowledge and skills in ICT can impact the effective use of technology in the team (Kauffmann, 2015).

Leadership in virtual teams can take different styles, just like in collocated teams. However, certain leadership styles may be more effective in virtual settings. For example, transformational leadership has been found to be particularly effective in virtual teams, as it emphasises inspiration, vision, and motivation (Powell et al., 2004). Additionally, empowering leadership, which emphasises delegation and trust, has also been found to be effective in virtual teams, as it can help to promote self-management, reduce micromanagement, and increase team members' sense of ownership and responsibility (Kimble et al., 2005). Both leadership styles focus on creating a positive team culture, which is essential for building strong relationships and fostering a sense of community among team members (Martins et al., 2004).

In conclusion, effective leadership in virtual teams requires a balance between task orientation and people orientation, explicit communication, structure and trust measures, and the use of leadership styles that emphasise inspiration, motivation, delegation and trust to promote a positive team culture and strong relationships between team members.

1.6 Selecting individuals for effective dispersed teams

This section focuses on the individual perspective of working in a dispersed team. While the previous sections discussed best practices for organisations and teams to improve the functioning of dispersed teams, it is important to recognise that not everyone is well-suited to working in such a setting. This section will provide an overview of the skills or personality traits that can contribute to a successful dispersed team.

One of the essential prerequisites for being a member of a dispersed team is having digital skills. The World Economic Forum (2020) highlights "digital skills" as one of the top skills needed for the future of work, including the ability to use digital collaboration tools. In addition, communication, problem-solving, and self-regulation are important skills, as noted by Balthazard et al. (2004). Communication, which was discussed in section 1.5, is particularly critical. Problem-solving is also essential because team members can face various problems, such as technical issues, communication barriers, or cultural differences. Finally, self-regulation is crucial because members must work independently without constant supervision.

Dube & Marnewick (2016) suggest that individuals who are self-motivated, willing to learn new technology, possess good time management skills, and are able to work independently are more likely to be successful in dispersed teams. However, extraversion and expertise together can lead to a non-constructive interaction style that hinders the team from achieving synergy and satisfaction with the team process (Balthazard et al., 2004). Therefore, when selecting team members, it is important to consider both technical and social skills (Hertel et al., 2005).

Additionally, individuals' previous experiences with virtual teams can influence their

willingness to work in dispersed teams. Individuals who have had positive experiences with virtual teams in the past are more likely to have positive attitudes towards working in these teams in the future (Gajendran & Harrison, 2007).

While past experiences can be considered when selecting team members for a virtual team, selection should not be based solely on this criterion. Organisations can adopt a range of selection criteria mentioned above to identify potential members who are well suited to virtual work. In addition, personality tests, cognitive ability tests and other selection tools can be used to facilitate the process of identifying suitable individuals.

1.7 Conclusion

In this chapter, we have been cooking up the recipe for success in dispersed teams. Just like a gourmet meal, creating a successful dispersed team requires the right ingredients and careful attention to their preparation. Our objective was to gain insights from the scientific literature to answer the research question of whether collaboration between members of a dispersed team can be both effective and enjoyable. A table summarising the impacts of each factor, together with the recommendations from the literature, is presented in annex (refer to Annex A on page 49).

Just as too much salt can spoil a dish, the different dimensions of dispersion can disrupt the performance of a team. Distance, for example, can limit informal interactions and discussions, leading to reduced communication and socialisation, and thus a lack of coordination and mutual understanding. However, functional and perceived proximity can help to mitigate these difficulties and strengthen team cohesion by adding some flavour. Time is also crucial, and it is important to find the right balance, just as perfect timing is essential for a well-cooked dish. A greater dispersion of time can lead to breakdowns in communication, but it can also result in faster completion of tasks and increased productivity.

Cultural differences can be like adding exotic spices to the mix: the presence of people from different cultural backgrounds can be both a challenge and an opportunity and it is important to leverage this diversity through clear lines of communication and cross-cultural training to ensure that the flavours blend well. Organisational and configuration dispersion can also disrupt team harmony, much like improperly mixed ingredients can ruin a dish.

The nature of the task at hand is another factor that impacts the performance of dispersed teams. Effective communication and coordination are essential for high performance in complex tasks, and the interdependence of tasks is another important factor to consider.

To make a successful dispersed team, several key ingredients, or enablers, are crucial. The literature has highlighted the importance of trust, communication, leadership, technology, information, and process in creating an effective dispersed team. Like the right combination of herbs and spices can elevate a dish, the right balance of these ingredients can create a high-performing team.

Trust is the secret sauce that binds the team together, while communication acts as the utensil that stirs it all up. Team leaders must establish and maintain a culture of trust among team members, promote collaboration, and encourage positive interactions to build affective trust. Effective communication is also essential, as dispersed teams often lack the non-verbal cues present in face-to-face communication.

Leadership adds the finishing touches, providing structure and selecting the right leadership style, such as transformational and empowering leadership, to bring out the best in each team member. Leaders must provide clear guidelines, protocols, and expectations to ensure that team members understand each other and have access to the information they need.

Finally, technology plays a crucial role in facilitating communication and overcoming distance-related challenges, much like kitchen tools make it easier to prepare ingredients. The right technology and communication tools must be selected based on the needs of the team and the nature of the task.

To sum up, creating a successful dispersed team is like cooking a delicious meal – it requires the right ingredients, careful preparation, and attention to detail. The quality of each ingredient, as well as their proper balance and integration, will determine the success or failure of the team. Furthermore, just as a master chef selects the best ingredients for their recipe, selecting individuals with the right skills and personality traits are also crucial for success in a dispersed team environment.

In the next section, we will examine empirical research on real dispersed teams to better understand the practical challenges and strategies for success in a dispersed team environment.

Chapter 2. Empirical part

This chapter discusses the empirical aspect of our study, examining the selected company in detail. We explore the research design, results and analysis, including team structure, task management and team dynamics. In addition, we provide advice for managing remote teams and discuss future research and limitations of the study.

2.1 Company overview

To critically examine the various theories presented in scientific literature, interviews were conducted with various profiles within the IT company, ARHS Developments. This section offers a comprehensive overview of the company's primary operations, organisation, and work processes, with a particular focus on dispersed teams. This background information provides a basis to interpret the respondents' insights, which will be explored in greater depth later in this chapter.

Founded two decades ago, ARHS Developments is an IT consultancy firm that specialises in software development and provides additional services in mobile development, infrastructure, machine learning, and more. The company's culture is built on shared values of agility, care, continuous improvement, innovation, and excellence. ARHS's mission is to deliver top-quality projects on time and within budget, with a vision of becoming the most caring and reliable IT company in the market for both clients and employees. A flat management structure and a no-bureaucracy policy are essential components in achieving the company's mission.

ARHS operates on a meritocratic principle, rewarding employees for their abilities and achievements rather than external factors. Performance evaluations drive salary increases, promotions, and benefits, allowing the company to recognise talent and empower employees to make autonomous, positive business decisions.

Originally established in Luxembourg, ARHS has rapidly expanded and now operates in nine countries, as illustrated in Figure 3: Luxembourg, Belgium, Greece, Italy, France, Portugal, Bulgaria, Cyprus, and Jordan. With over 2,500 consultants, the company is organised into 17 specialised entities. This structure, however, does not impede collaboration among employees from different entities or countries. When necessary, employees across entities collaborate to capitalise on their unique expertise, resulting in the formation of dispersed teams – a common arrangement within the company.

The company predominantly employs a project-based team structure for its activities, assembling cross-functional teams with diverse roles such as analysts, developers, team leaders, and testers to create the product. This approach aligns with agile project management methodologies. Each team member is responsible for the project's success and the quality of the end product. Project teams typically consist of 5 to 15 members, potentially including individuals from different entities and locations based on the project's requirements. A project director or delivery manager oversees the project, along with multiple team leaders, depending

on the project's size.

Figure 3. ARHS Group offices worldwide: 17 entities in 9 countries (ARHS Group, 2022).

The composition of dispersed teams at ARHS is flexible, with no strict guidelines for member selection or team organisation. In some cases, teams may be configured with a single competency centre, such as business analysis, based in one location. Alternatively, members from the same centre could be distributed across multiple sites. Teams may also comprise members from various entities or countries, often including up to three countries in the mix. In terms of team organisation, there is a range of possibilities. Some teams might be assembled based on the geographic locations of members, while others could prioritise factors unrelated to location (e.g., area of expertise, seniority, etc.), leading to the formation of cross-location sub-teams. Further details on these arrangements will be discussed in section 2.3, where the results are presented and analysed.

ARHS uses distributed teams for various reasons. First and foremost, this approach allows the company to allocate experts to appropriate projects where their skills are required, irrespective of their geographical location. Second, during team formation, certain constraints must be considered, such as ensuring that analysts, who frequently interact with clients, are situated near the client for occasional face-to-face meetings. For instance, ARHS manages multiple projects for the European Commission, headquartered in Brussels, which makes it advantageous to have the analysis team located in the same city. Nonetheless, developers and testers can still be based in different locations. Therefore, the dispersed team structure allows the company to accommodate such constraints without being limited to a single location for the entire team.

Another significant motivation for incorporating team members from locations outside of Belgium, for example, is cost-effectiveness. Hiring developers from countries such as Luxembourg or Greece proves to be more cost-efficient for the company than employing developers from Belgium. Adopting this strategy enables ARHS to maintain its competitiveness in the market while capitalising on a diverse talent pool spanning multiple countries. It is a key enabler to continue the growth of the company. This approach also fosters collaboration and

knowledge exchange among employees from different cultural backgrounds, ultimately strengthening the company's overall performance.

Finally, ARHS adopted teleworking due to the COVID-19 pandemic, despite initial reluctance from management, as they feared it would negatively affect the team spirit that contributed to the company's success. However, the company has evolved and employees now work from home one or, in exceptional cases, two days a week, leading to new challenges. Team members who work in the same office now need to coordinate their schedules to ensure they have opportunities to interact and collaborate in person during the week. While teleworking offers benefits, it is crucial for team members to remain vigilant and maintain regular face-to-face connections with colleagues.

After learning about the business and the environment in which the data were gathered, the next step is to investigate the data collection methodology.

2.2 Research design

This section provides an overview of the data collection, participants, and data analysis method used in this study.

2.2.1 Data collection

To collect data on the experiences of consultants in dispersed teams at ARHS, I conducted semi-structured interviews with various employee profiles in the company. Semi-structured interviews are a useful research method as they allow for flexibility and adaptability in the data collection process. While there is a general framework of questions to be covered, the interviewer has the freedom to explore and follow-up on relevant responses in real-time.

The preparation for the interview involved creating a list of questions based on the various themes and topics identified during the literature review in the previous chapter and my experience working in dispersed teams. As an employee of ARHS working in dispersed teams for almost five years, I have insider knowledge of the company's culture and work practices, which are valuable to shape the research questions and interpret the results.

The questions were divided into themes and used as a support for the interview to explore specific areas. Different questions were asked depending on the interviewee's profile, such as team organisation for managerial profiles or the desired skills for dispersed team leaders for non-managerial roles. Examples of the questions asked can be found in (refer to Annex B on page 52).

Semi-structured interviews facilitate a more personal connection between the interviewer and the interviewee, allowing for a deeper exploration of individual experiences and perspectives. However, there is a risk of interviewer bias, where my expectations or prior knowledge can influence the participant's responses. To avoid unintentionally steering participants' answers, it was essential to maintain a neutral and non-judgemental attitude during interviews.

The interviews were conducted in-person whenever possible, but some were conducted remotely for participants located in Luxembourg or Greece. The duration of the interviews ranged from 30 minutes to an hour, depending on the interviewee's willingness to talk.

It is worth noting that this work is based on two sources of data: the semi-structured interviews and my participant observation, as an employee of ARHS working in dispersed teams for almost five years. The insights from my personal experience working in dispersed teams will be used as input for the results and discussion later on in the thesis.

2.2.2 Participants

Table 3 presents the seven persons who were interviewed, along with some pertinent information about them. They were carefully chosen to capture a wide variety of perspectives, considering factors such as office location, areas of expertise such as analysts, developers, and project managers, varying experience levels from junior to senior positions, and diverse dispersed team configurations.

Further information about the employees' backgrounds shows that the majority of them joined ARHS right after finishing their studies. For those who worked elsewhere, it was only for a brief period of 1 to 2 years. The age range of the participants is around 30 years old, with some being slightly older or younger. Lastly, their team sizes vary from 10 to 15 members.

Name	Gender	Nationality	Office location	Area of expertise	Experience at ARHS (years)	Current project
Virginie	F	Belgian	Brussels, Belgium	Analysis	5	EUROPASS
Quentin	M	Belgian	Brussels, Belgium	Project management	5	EUROPASS
Julien	M	Belgian	Belval, Luxembourg	Project management	13	SOFT-DEV
Timothée	M	Belgian	Belval, Luxembourg	Project management	8	SOFT-DEV
Melvin	M	Belgian	Belval, Luxembourg	Development	6	SOFT-DEV
Elena	F	Italian	Brussels, Belgium	Analysis	2	SOFT-DEV
Stergiani	F	Greek	Thessaloniki, Greece	Development	2	EUROPASS

Table 3. Overview of interviewees' profile.

All interviewees are located in Europe, with most of them situated relatively close to each other. The distance between the Brussels and Luxembourgish offices, for example, is approximately 230 km, which can be covered in 2 to 3 hours by car. The Greek and Belgian offices can be reached by plane within 3 hours. It is also worth noting that there is only a one-hour time

difference between Belgium and Greece. This proximity between team members suggests that temporal and cultural dispersion, among other dimensions of dispersion, may not significantly affect the discussions with the interviewees.

2.2.3 Data analysis

After the interviews were conducted and recorded, they were transcribed and summarised to provide a detailed understanding of each participant's perspective and opinions. Each summary can be found in annex (refer to Annex C on page 56).

The interview summaries were then analysed using a thematic analysis approach to identify key themes related to the research questions. Thematic analysis is a widely used qualitative analysis method that involves identifying, analysing, and reporting patterns (themes) within the data. The analysis process was iterative, involving multiple rounds of coding and theme refinement. The identified themes were then synthesised to draw conclusions about the research questions.

2.3 Description of the results

This section presents the responses of the study participants, noting similarities and differences, and categorising them according to the themes covered.

2.3.1 Team structure and communication

Team configurations. Two different team configurations were reported by the respondents. The first model, used by the SOFT-DEV team, consists of two sub-teams created based on expertise and location. The business analysts are located in Brussels near the client, while developers and testers are in Luxembourg. Each site has a team leader responsible for their respective location's competence centre, and they act as a bridge between the two sub-teams. Julien (project director) described their approach as trying to maximise efficiency by minimising interactions between team members. This approach was also used in collaboration with another company, but for financial reasons, i.e., to allocate tasks and assign responsibility more effectively, and to distribute payment for the work completed. He claims that, in order for it to succeed, there must be at least one person on each side who assumes ownership of the team, and is reliable and transparent. In other words, trust and expertise are key elements in this model. Clearly, this siloed approach comes with a higher risk of missing important information, which can cause problems with the client.

The SOFT-DEV team's model was disrupted when two developers located in Belgium were added to the team, causing the development team to be scattered across two sites. This experience was considered a catastrophe by the team and ended after a few months. According to Melvin (senior developer), close support was required for the two new members, and it was difficult for the team to integrate them without face-to-face meetings.

In contrast, the team EUROPASS adopted a different approach, with analysts in Brussels and developers dispersed across Brussels and two sites in Greece. Instead of forming separate teams based on location, they created a single team with one technical team leader overseeing all

developers, regardless of location. This prevented competition between teams and fostered collaboration. The configuration has been effective, and Quentin, the team leader, emphasises the importance of patience and a long-term perspective for such team structures.

Communication challenges and strategies. The theme most naturally and quickly addressed by all interviewees is – without surprise – communication between the different members of a dispersed team, and in particular communication related to the work.

The interviewees agree that effective communication can be difficult to achieve in a dispersed team, with a lack of non-verbal cues and potential misunderstandings in written communication being the primary challenges. While video calls can mitigate some of these issues, they do not entirely replace the benefits of in-person interaction. Elena (analyst) highlights the difficulty of interpreting intention and emotion through virtual means, while Julien points out the impact of body language in communication, explaining how written communication can be misinterpreted and perceived as more aggressive. He draws a comparison to situations where people may insult others while driving but would not do so if face-to-face, emphasising the detachment in written communication similar to social media, where people may say things, they would not if they knew the person well. Additionally, Stergiani (developer) points out that not everyone feels comfortable with the use of cameras, as technical issues or personal preference may prevent their use.

All interviewees concur that regular communication and interaction among team members are crucial for ensuring project progress. To achieve this, the teams have implemented various strategies such as daily stand-ups and synchronisation meetings. Melvin emphasises that such interactions must serve as real opportunities for collaboration and not be seen as mere formalities.

One important point that emerged from the interviews is the need for clear communication. Several respondents highlighted the importance of being extremely clear on expectations, deadlines, tasks, and updates. Some also noted that conversations that take place informally in the office should be included in the communication to ensure that remote team members are not left out.

One area of disagreement among the interviewees is about the level of collaboration required between team members. While all agree that team members should be able to communicate with each other to ensure smooth project progress, some do not see the need for everyone to collaborate closely. Julien suggests that the necessary level of collaboration depends on the collaboration model in place. For example, if information sharing is facilitated through a single individual responsible for each location, then regular communication between those individuals may suffice. On the other hand, Melvin emphasises the need for a more global approach to communication, where all team members receive important information and changes to avoid frustration and ensure effective information transfer. Quentin stresses the importance of soliciting input from all team members and promoting interaction between meetings, which

aligns with his leadership model as he manages a development team with a part located in Greece.

2.3.2 Task management and technology

Nature of the task. Some respondents stressed the advantages of collocation for handling complex discussions involving multiple potential solutions or interpretations, as Virginie (senior analyst) pointed out. The lack of a shared physical space impedes brainstorming with tools like whiteboards and paper and limits virtual meetings to a single speaker at a time, reducing productivity. In contrast, when people are in the same physical space, they can have one-to-one conversations with each other and collaborate more easily.

Processes and technology. The interviewees unanimously emphasise the importance of implementing processes to facilitate efficient communication and synchronisation in dispersed teams, in order to prevent chaos. They stress the need to establish clear roles and standardised communication protocols. Members of the SOFT-DEV team shared their experience of creating a Jira board, where developers can submit questions for business analysts, instead of using private messages that could easily be lost. According to Melvin, this approach allows team members to contact business analysts directly or post questions on a dedicated board, striking a balance between flexibility and structure.

Interviewees mentioned using tools like Microsoft Teams (for collaboration and communication) and Jira (for project management), along with emails primarily used for communicating with external parties such as clients. Quentin suggests using fewer tools to prevent gaps between team members.

Additionally, Quentin describes an initially strict follow-up process on Jira, during which he would send reminders every two days for team members to update their tickets. He found this approach especially necessary for colleagues who were not physically present, in order to establish a common foundation for communication and synchronisation.

2.3.3 Team dynamics and leadership

Integration and cohesion. All respondents place a strong emphasis on the benefits of integration and cohesion in dispersed team, believing that remote team members should be fully included and valued. In the EUROPASS team, this is achieved by treating all team members equally, regardless of location. They are all given similar tasks, offered equal access to training and professional development opportunities, and their performance is addressed openly and transparently.

In the SOFT-DEV team, no specific daily actions are in place to ensure cohesion. Timothée (delivery manager) observes that not all team members may perceive the team as a unified entity, as some may have less interaction with colleagues from the other site depending on their project role. For example, as a manager, he frequently interacts with the Brussels-based business analysts, but this might not be the case for some developers who prefer to rely on more

senior developers in their office for their questions. He stresses the importance of a common vision for ensuring responsibility and accountability but admits that nothing is currently in place, except for occasional team-building events. Elena acknowledges that she occasionally feels left out of the Luxembourg team and blames it on the distance. She considers her team to be the people working in her open space in Brussels on similar projects as her, even though she is not collaborating directly with them.

Socialisation. All interviewees recognise the importance of fostering relationships with remote colleagues, acknowledging that socialisation can reinforce team dynamics. They note that work is more enjoyable and easier when they get along with their colleagues. Melvin highlights the role of experience and familiarity in shaping effective communication, as they enable better understanding of the right questions to ask and the most suitable communication methods. He also believes that personal connections with colleagues humanise them and give their roles more meaning, thereby creating a sense of belonging and purpose within the team.

However, the interviewees also unanimously agree that they feel less connected to remote colleagues compared to those who are collocated, due to the limited opportunities for casual, non-work-related conversations. Dispersed teamwork inherently differs from working with collocated colleagues in terms of social dynamics. Elena concurs, stating that forming strong social bonds is challenging without face-to-face interactions. While this does not directly impact her work efficiency, it can affect her overall job satisfaction.

Several respondents believe that meeting remote colleagues in person would enhance their relationships. Some consider this a valuable, though not essential, aspect for project success, while others view it as a prerequisite. Julien, for example, points out that working with unfamiliar individuals can create uncertainty about their intentions or motivations, emphasising the importance of knowing and seeing them in person. Familiarity makes it harder for negative interactions, such as criticism or insults, to occur. He cites a project involving a Greek team that experienced difficulties; to resolve the issues, they now plan to visit Greece and meet the team in person.

Many respondents suggest using informal conversations, such as casual messages and personal questions, as a means to strengthen bonds. They believe that embracing informal conversations during work hours can promote team bonding and deeper understanding, even if it diverts focus from immediate tasks. However, some respondents prefer to maintain primarily professional relationships with remote colleagues while remaining cordial during work hours.

Team building. The majority of interviewees indicated that team-building activities, whether virtual or physical, are not frequent, although they would like to make them more frequent to promote inclusion and camaraderie. Melvin emphasised that such activities should not be one-time events, but rather should be conducted regularly to strengthen team relationships.

While most participants prefer physical events, some recognise the effectiveness of virtual ones.

Some interviewees highlighted challenges associated with virtual events: Virginie mentioned her discomfort in virtual settings, finding it difficult to initiate conversations through a screen, and suggested that someone should manage these events to ensure everyone is engaged. Quentin pointed out the difficulty in coming up with ideas for virtual events, which require more effort than simply going out for a drink.

A virtual event was organised for the EUROPASS team and was well-received by team members. In contrast, the SOFT-DEV team has not held any virtual events. Instead, they organised a day at an office located between their two main locations, which was highly enjoyed by all team members and contributed to a sense of unity.

Team leading and coaching. The interviewees unanimously acknowledge the critical role of team leaders in dispersed teams, highlighting the need for soft skills, effective communication, and constant monitoring of team members' progress. Virginie stresses the importance of maintaining consistent alignment.

Many interviewees express difficulties in learning, coaching, and providing guidance, particularly for newer or younger team members. They find it easier to learn and receive guidance when someone is physically present. Melvin elaborates on this, stating that when joining a project, the lack of experience, both technical and interpersonal, complicates remote interactions. It is necessary to learn remote colleagues' work style, anticipate their reactions, and build trust. Julien agrees, stating that coaching opportunities are frequently missed in remote work environments, as remote team leaders struggle to identify when someone is stuck on a task. For this reason, he believes having a remote team leader is not ideal. Both suggest a "transition" period at the beginning, with more in-person contacts and interactions to address these challenges.

As a remote team leader, Quentin initially faced communication difficulties with Greek developers, who were often isolated and left to work independently on other projects. He overcame this by being extremely clear in his communication, organising one-to-one meetings with remote team members, being attentive during meetings, and promoting collaboration between developers at both sites. He noticed that developers naturally helped each other, even engaging in pair programming[1] with remote colleagues. Quentin emphasises the importance of patience and a long-term perspective in managing dispersed teams. In contrast, Stergiani suggests that having separate team leaders in different locations may be more beneficial for organisational purposes.

2.3.4 Team characteristics and environment

Team member characteristics. Approximately half of the interviewees concur that certain characteristics can influence an individual's capability to perform effectively in a dispersed

[1] Pair programming is a technique where two programmers work together on the same computer to complete a task, taking turns as "driver" and "navigator" to improve code quality, reduce errors, and learn from one another.

team. These respondents highlight specific traits they consider unsuitable for such teams, including difficulties with communication or procedures, resistance to feedback, lack of engagement, and expressing opinions without considering others. Julien, in particular, emphasises the need for specific technical skills for remote work, such as improved communication through tools like diagrams and drawings, and the ability to write structured emails or clear, concise messages.

The remaining interviewees focus on personal preferences or willingness to work in a distributed team, implying that an individual's adaptability and openness to the idea determine their success in a dispersed team. Elena advances that suitability for dispersed teams is more about personal preferences and individual work styles, with some preferring regular in-person interactions, while others may work more independently. Timothée claims that anyone willing to work in a distributed team can succeed, but those resistant to the idea might face challenges in adapting to the new work approach.

Culture. The topic of cultural differences and their potential impact on collaboration was not widely discussed. However, a few interviewees highlighted the significance of being mindful of these differences. Timothée underlines the importance of aligning expectations across all sites to avoid any potential obstacles to integration. Meanwhile, Virginie and Stergiani pointed out the language barrier as a potential obstacle, as individuals may find it easier to convey their ideas in their native language, which can inadvertently exclude non-speakers.

Collocated versus dispersed teams. When asked about their preference between working in a collocated or dispersed team, the interviewees reveal various opinions. Some interviewees express a clear preference for collocated teams, as they feel more motivated and find their work more meaningful when they are in close proximity to their colleagues. This is the case for Elena, for example, who does not see many advantages to dispersed teams, apart from the logistical benefits. Others believe that dispersed teams can work effectively under certain conditions, and therefore collocated teams are not always necessary. However, they do note that collocated teams are more enjoyable due to a stronger sense of connection with co-workers. Lastly, one respondent has had positive experiences working in dispersed teams and is used to this. She is satisfied with this setup and would not change it.

2.4 Analysis of the results

In this section, we compare the obtained results through the lens of the literature on dispersed teams to identify key observations, unexpected findings, and challenges faced by ARHS teams.

The interviews revealed the presence of distinct team structures at ARHS, each with its own set of pros and cons as well as unique challenges. These configurations are represented in Figure 4. In this context, a "sub-team" refers to a group of individuals who work and organise themselves independently from other groups, although they may interact with other sub-teams.

The first configuration, labelled the "siloed approach", involves dividing the team into

collocated sub-teams, with each group responsible for a specific segment of the project. These segments could be distinct modules of an application, different centres of expertise, or other divisions. In this setup, each collocated sub-team is in charge of one part of the larger puzzle.

The second configuration, called the "integrated approach", assembles teams without considering location, resulting in team members working from various places. The entire team is accountable for the complete puzzle. This approach can be further adapted for larger team by forming sub-teams, each focusing on a specific aspect of the application while still including members from different locations.

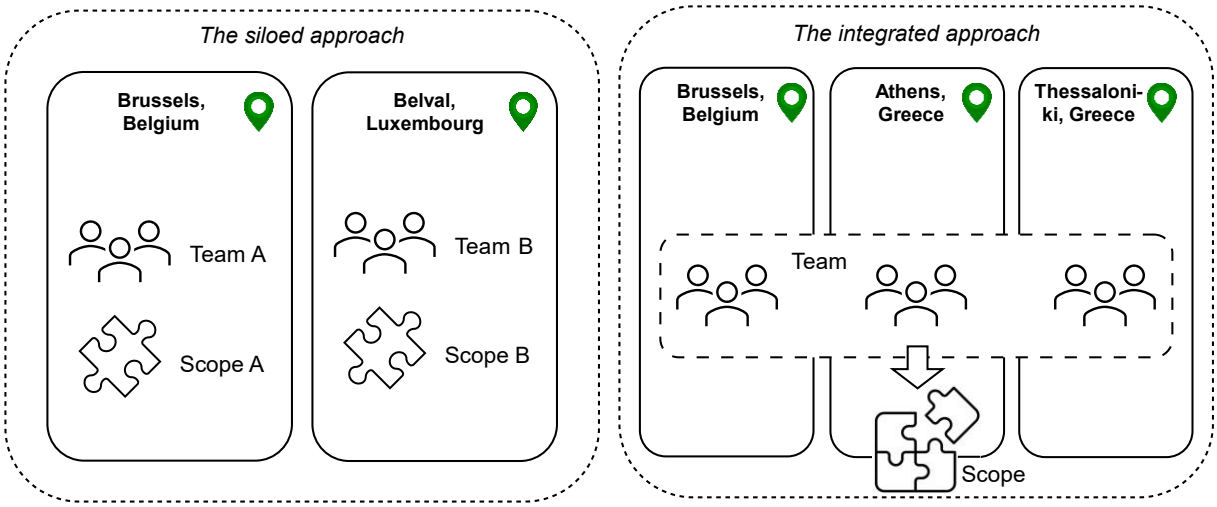

Figure 4. Comparing team configurations: siloed versus integrated approach at ARHS.

Both approaches are effective in practice, but each requires specific conditions for optimal functioning, which must be considered when creating a team. The siloed approach aims to minimise interactions between sub-teams to optimise productivity through collocated team members, relying on trust and expertise of each sub-team. Clear responsibilities must be established, as there is a risk of tasks falling between two sub-teams with no one to handle them. Each subgroup must have faith in others' competence and have a designated, transparent leader accountable for their work who serves as a bridge between sub-teams.

The main advantage of this model is the absence of remote collaboration barriers, as close co-workers are collocated. However, this approach faces several challenges. If key ingredients such as trust and expertise are lacking, sub-teams may enter into conflict. Then, isolating sub-teams can lead to uneven quality due to different cultures and work methods. Lastly, hiring new resources is limited by the location, as experienced by the SOFT-DEV team when integrating two Brussels-based developers into the Luxembourgish team.

The integrated approach aims to foster collaboration among team members from different locations, forming truly dispersed teams. While this method eliminates most challenges of the siloed model, it presents new obstacles such as a considerable amount of time required to ensure that everyone is on the same page and that the processes are well-defined and functioning

effectively, making it a long-term investment. A significant concern, highlighted by multiple respondents, is the complexity of mentoring and coaching due to remote team leaders, which is in line with the literature (Martins et al., 2004). This can be mitigated by having senior members at each location to guide junior colleagues. Another issue is the risk of not knowing what is happening on the other side when there is a remote team leader. This underscores the importance of the "trust" dimension, where the team leader must trust that their team members are committed, and team members must trust their team leader and feel comfortable coming to them with any issues. Ideally, having trustworthy and transparent individuals on both sides is necessary for this approach to succeed.

The team's experience with the two models aligns with Alderfer and Smith's (1982) findings, which suggest that the type of configuration employed can impact group dynamics, leading to improved collaboration or increased competition and conflict among subgroups. While the literature review did not address how teams should be organised across multiple locations, a targeted research reveals that there are articles discussing the modular approach (Gassmann & von Zedtwitz, 2003), which shares similarities with the silo model described above. The integrated approach, which is commonly assumed in the literature, is the focus of Carmel and Agarwal's article (2001).

Both models also emphasise the crucial role of trust among dispersed team members, a factor that is widely recognised in the literature. From the interviewee's experience, we observe the presence of both components of trust mentioned by McAllister (1995), namely cognition-based trust and affective trust. The former relates to the need for team members to possess sufficient expertise and reliability to effectively follow established processes, while the latter stresses the importance of socialising with teammates to foster enjoyment of working together and develop trust in collaborative efforts over the long term.

Still related to trust, the importance of leadership in maintaining trust is particularly pronounced in the context of the integrated approach with a remote team leader. The two perspectives that contribute to the formation of trust in leadership according to Dirks & Ferrin (2002) are evident in the practical examples. The first perspective, relationship-based trust, is based on the quality of interactions between the leader and the team members, as well as the level of closeness they share. Open and honest communication, provision of support and assistance when needed, and fair treatment of all team members are key factors that foster trust, as demonstrated by the actions taken by the team leader on EUROPASS.

The second perspective, character-based trust, places greater emphasis on the leader's personal qualities and values rather than the nature of their relationship with their team members. Most interviewees explicitly stated that they valued competence, transparency, and benevolence in their leader. It is evident that leaders play a critical role in creating a motivating and engaging environment for team members, even in the face of distance and separation.

Another key finding of the study is that distance still plays a significant role in shaping team

dynamics, contradicting the notion that "distance is dead" popularised by Lojeski (2006). While all interviewees acknowledged the importance of social bonding to enhance work efficiency and enjoyment, they reported feeling less connected to their remote colleagues compared to their collocated ones. The negative impact of distance on team dynamics is consistent with the research by Bell & Kozlowski (2008), who noted that it limits opportunities for informal interactions, which the interviewees also experienced.

Another explanation for the reduced connection with remote colleagues is the difficulty of establishing emotional bonds over a camera due to missing social cues (Jarvenpaa & Leidner, 1998), as confirmed by several interviewees. While video conferencing technology can partially mitigate this, it cannot fully replicate face-to-face interactions (DeRosa et al., 2004). Respondents also reported that involving remote team members requires more effort and is often seen as a burden compared to collocated members.

The literature suggests that functional distance is more important than geographical distance in shaping team relationships (Festinger et al., 1950). Respondents suggested informal conversations to bridge the functional distance and create a sense of familiarity. Communication frequency also influences perceived proximity (Boyer O'Leary et al., 2011), which can be enhanced by embracing informal conversations during work hours. Despite these efforts, however, it seems that informal conversations are not enough to compensate for the distance, as reported by the respondents. This raises questions about whether informal discussions are not held often enough, or whether they are simply not enough to compensate for the lack of shared offices.

Next to that, several respondents believed that meeting remote colleagues in person would enhance their relationships, supporting Joinson's (2002) suggestion that physical meetings can improve communication and trust in distributed teams. For some, this in-person interaction is considered essential for project success. Many interviewees suggested the need for a transition period at the beginning of collaborations among dispersed team members, during which they should meet more frequently in person.

This initial project phase typically involves a myriad of challenges, making it particularly difficult for distributed teams. Team members often need to learn new concepts, which requires coaching from others; they must also learn how to interact with their colleagues effectively. Additionally, the tasks to be performed are usually novel and demand brainstorming activities. Several interviewees noted that for tasks requiring discussion and brainstorming, physical meetings are necessary. These observations regarding the nature of the tasks align with Bell and Kozlowski's (2008) findings, which indicate that non-routine tasks pose significant challenges for dispersed teams.

Lastly, the study identified two major trends in the interviewees' opinions on selecting team members for dispersed teams. Half of the respondents highlighted specific characteristics as unsuitable for dispersed teams, such as communication difficulties, resistance to feedback, lack

of engagement, and disregarding others' opinions. This aligns with the literature, which emphasises the essential prerequisites for being a member of a dispersed team, including digital skills (World Economic Forum, 2020), communication, problem-solving, and self-regulation (Balthazard et al., 2004). Hertel et al. (2005) stress the importance of evaluating both technical and social competencies when selecting team members.

In contrast, the other half of the interviewees emphasised personal preferences and willingness to work in a distributed team, indicating adaptability and openness as critical factors in determining success in a dispersed team environment. This underscores the importance of recognising that dispersed teams comprise individuals with diverse personalities, and their preferences regarding human contact can significantly impact team dynamics. Some team members may thrive on personal interactions and feel more connected through regular face-to-face communication, while others may prefer working independently and avoiding direct contact. Therefore, acknowledging and accommodating these individual preferences is essential to ensure that all team members feel supported and comfortable in their work.

2.5 Managerial implications

The previous analysis emphasises how crucial project managers are when it comes to the effective functioning of dispersed teams. However, it is equally important to recognise the role of the company in empowering these teams and providing the support necessary for effective performance. Through the interviews and my personal experiences, several enablers that contribute to the smooth operation of dispersed teams have been identified.

First, it is essential to provide the necessary tools to facilitate remote collaboration. Robust IT support must also be available in all time zones where the company operates to solve technical problems that may hamper remote working. To optimise the use of technology, companies can offer training to their employees, as even in IT companies there is often room for improvement in harnessing the full power of daily tools.

Beyond technology, the establishment of clear policies and guidelines for working together is essential. As part of its organisational structure, ARHS has established a horizontal unit to refine corporate practices and standards, support projects and foster idea generation across the organisation. Although not specifically designed for dispersed teams, the existence of such unit provides a basic support structure that extends its benefits to all teams, including those in different geographical areas. This horizontal unit embarked on a study of dispersed team management, identifying effective practices and flagging areas of improvement. These findings, grounded in practical experiences and lessons learned from various ARHS teams, have informed the creation of a set of guidelines. These guidelines provide a structural framework that all teams can refer to, assisting them in navigating common obstacles and establishing efficient work practices.

Furthermore, ARHS organises an annual meet up inviting all employees from every entity to

engage face-to-face. This event, embodying the ARHS ethos of “work hard, play hard”, provides an opportunity for members to interact over a shared meal and enjoy a dance together.

Drawing on the insights gathered throughout this work, a practical “cookbook” has been complied. This resource equips managers, whether at the project or company level, with recommendations for managing dispersed teams. Spread over the next two pages, this cookbook offers 33 practical tips, each supported by a justification and categorised into five key areas: management, tools and infrastructure, communication, coaching and learning, and team spirit. The aim is to provide tangible strategies to foster productive and enjoyable work environments for dispersed teams.

2.6 Future research directions

This section proposes several directions for future research, highlighting gaps in the existing literature and opportunities for further exploration. One area involves examining the benefits and drawbacks of the two team configurations identified in this study. Further investigation is needed to determine the specific conditions that make each configuration most effective, including the effects on performance, subgroup conflicts, and satisfaction in various contexts.

Another area for exploration is alternative strategies for remote coaching and mentoring in dispersed teams. With our study highlighting related challenges, future research could develop innovative approaches to support junior members’ professional growth.

Moreover, investigating personal preferences and individual differences in dispersed teams is essential. Research could examine the impact of personality traits, communication preferences, and work styles on team dynamics, as well as how members’ preferences for human contact affect satisfaction and engagement.

Lastly, our study excluded interviews with individuals from other ARHS entities, such as Bulgaria and Jordan, introducing cultural and temporal dispersion variables. Future research should consider the influence of cultural differences on dispersed IT teams’ performance.

2.7 Limitations

Several limitations must be recognised to better understand and contextualise the findings, while also informing future research. Firstly, the focus on a unique IT firm may restrict the generalisability of results due to variations in organisational structure, culture, and practices. Future studies should encompass multiple companies across diverse contexts. Secondly, the small sample size may limit applicability; larger samples could yield more comprehensive insights. Lastly, potential biases may arise from my familiarity with interviewees as a current employee, potentially influencing participants’ responses or my data interpretation.

	RECOMMENDATIONS	WHY?
MANAGEMENT	**#1 Define a clear team structure.** Select a team model that fits your project, weighing siloed vs integrated approaches based on the company guidelines, and establish a clear structure with individual site responsibilities.	Ensures effective communication, collaboration, and accountability, leading to greater project success.
	#2 Consider the project staffing during proposal writing. When creating an offer for a client, consider team organisation, particularly for a dispersed team. If possible, involve all locations in the estimation process and estimate shared tasks with all teams involved.	Ensures accurate project organisation and estimation, while promoting clear understanding of responsibilities and fostering collaboration.
	#3 Assess team members' adaptability to dispersed teams. Discuss with team members their willingness to work in such team and evaluate their ability to communicate effectively via remote channels.	Pinpoints challenges and provides targeted support to enhance communication and engagement.
	#4 Set clear goals and roles. Communicate goals clearly to the team, define job responsibilities and roles. Ensure understanding to promote accountability and prevent overlooked tasks. Document this information (e.g., on a wiki).	Promotes clarity, collaboration, and timely work completion while avoiding oversights.
	#5 Implement a strict follow-up process. Set deadlines and establish a follow-up process, such as reminders, to ensure awareness of deadlines and on-track progress.	Ensures task awareness and deadlines, minimising confusion and delays.
	#6 Treat all team members equally, regardless of location. Assign similar tasks, provide equal access to training and professional development opportunities, and address performance openly and transparently.	Fosters inclusivity and value, critical for cohesive teams.
	#7 Share experiences with other team managers. Regularly discuss your experiences managing dispersed teams with other team managers to learn from each other.	Promotes exchange of best practices, fostering continuous improvement in managing dispersed teams.
	#8 Establish a dedicated support unit within the company. This unit would support all teams, whether dispersed or not, by refining practices, offering guidance, and drawing on practical experiences.	Enhances overall team performance, promotes effective collaboration, and fosters continuous improvement.
	#9 Offer dispersed team training programs to all employees. These trainings should focus on sharing best practices, raising awareness and developing skills for effective collaboration and management in dispersed teams.	Enhances team productivity, foster effective communication, and promote a positive team culture.
TOOLS & INFRASTRUCTURE	**#10 Ensure team members have the necessary equipment for virtual communication.** Check that all team members have a wide-angle camera and a headset with a microphone; provide support for those who do not.	Enhances team unity through visible video conferencing, clear audio, and reduced background noise.
	#11 Pick the right tools. Choose tools tailored to your needs, such as project management tools (e.g., Jira), chats (e.g., Slack, Teams), and file-sharing services (e.g., SharePoint). Make sure your team members are comfortable using them and emphasise the importance of keeping the project management tool up to date.	Enhances productivity, keeps everyone on the same page, easy tracking and simplifies remote collaboration.
	#12 Create a team wiki. Establish a team wiki (e.g., Confluence) with key details such as team organisation, procedures, contact info (names, roles, preferred contact methods), available contact times, and FAQs.	Centralises crucial information for efficient collaboration and increased access.
	#13 Use appropriate tools for team brainstorming and coaching. Choose appropriate tools (e.g., digital whiteboards for brainstorming and screen-sharing/remote desktop for coaching) and ensure everyone has access and knows how to use them effectively.	Allows for a more interactive and engaging experience, enables real-time collaboration, engagement, idea and information sharing.
	#14 Establish communication guidelines. Set expectations for response times, preferred communication methods, and appropriate usage of different tools (e.g., when to use email vs. instant messaging).	Prevents misunderstandings, reduces information overload, and ensures timely responses.
	#15 Schedule regular virtual meetings. This includes a daily check-in, weekly status, and individual check-in as necessary. Prepare a clear agenda, take concise notes, and assign an action owner for any arising tasks.	Facilitates communication, helps track progress, and fosters a sense of team unity.
	#16 Use video conferences with remote team members. Arrange video conferences for all team meetings	Video conferencing enables non-verbal cues, facilitating

COMMUNICATION	with remote members and ensure everyone has their video on. Emphasise video value for improved interactions and avoiding the sensation of talking to a computer.	effective communication and building trust. Mandating video-on promotes accountability and participation.
	#17 Avoid long chat discussions and have a call instead. Use video conferencing to facilitate the call and ensure alignment among all participants.	Calls are more efficient and promote better collaboration, issue resolution, and misunderstanding clarification.
	#18 Prevent team members from working in isolation for extended periods. Encourage regular check-in and ensure that team members have opportunities to collaborate and interact with others.	Isolation for extended periods can harm team members' productivity, morale, and well-being.
	#19 Foster open communication. Encourage team members to share their thoughts and ideas and create a safe space for open communication.	Open communication promotes creativity, builds trust, and ensures that everyone is on the same page.
	#20 Verbalise commitment, enthusiasm and optimism. Use words of encouragement to motivate and uplift your team and celebrate successes.	Reinforces trust's affective dimension, boosts morale, motivation, and promotes accomplishment and pride.
	#21 Share customer messages with the entire team. Communicate messages post-external meetings to limit attendance and avoid overloading. Ensure updates and decisions are communicated to the entire team.	Promotes project-wide awareness, reduces disconnection and facilitates collaboration across locations.
	#22 Be available and responsive. Promptly responding to emails and messages, and being available to answer questions and provide support.	Builds trust, shows that you value your team members' time, and helps ensure that everyone is on track.
	#23 Be understanding and constructive. Recognise remote work challenges and be sensitive to individual circumstances like time zones or personal responsibilities. Use positive language, active listening, and clarify expectations for alignment.	Builds trust, and creates a supportive remote work environment, promoting effective collaboration despite the risk of miscommunication.
COACHING & LEARNING	**#24 Invest in on-boarding of new members.** Make a page for newcomers and use ice breakers to help them feel welcome.	Inclusion, information, and connection help new team members collaborate effectively and productively.
	#25 Foster shared support and knowledge. Encourage team members to ask for help, and to offer help when they can. Set up regular check-in to build relationships and create a safe space for asking for support.	Fosters psychological safety, enhances trust, collaboration, and performance.
	#26 Provide regular feedback. Schedule regular feedback sessions with team members to discuss their performance and provide constructive criticism.	Improves job satisfaction, facilitates growth, development, and accountability.
	#27 Establish a reference point in each location to facilitate knowledge transfer. If there are only junior staff in one location, provide a technical coach on-site for assistance. Encourage asking local resources before remote team members for knowledge transfer.	Promotes issue resolution, knowledge sharing, and collaboration. Asking questions locally fosters effective knowledge transfer and faster responses.
TEAM SPIRIT	**#28 Bring the team together face-to-face occasionally.** Organise team-building events every few months, especially at the start of the project. Make sure remote team members can participate as much as possible.	Cohesion is key for productivity and collaboration. In-person meetings break barriers and foster positivity.
	#29 Implement remote team-building activities. Organise virtual team-building events, led by someone, such as online games, lunches, or brainstorming sessions, to initiate conversation and improve teamwork.	Facilitate communication and collaboration among all team members.
	#30 Create a virtual water cooler. Set up a dedicated chat room or channel for informal conversation and socialising.	Builds rapport, fosters a sense of belonging, and reduces feelings of isolation.
	#31 Establish a weekly tradition. E.g., using a bot to prompt team members to share weekend photos or stories.	Creates a more welcoming, inclusive work environment, improving job satisfaction and teamwork.
	#32 Foster a sense of shared identity. Create a team charter that outlines the team's goals, values, and objectives, and encourage team members to contribute to it.	Helps to build a cohesive team, and promotes collaboration and innovation.
	#33 Foster a culture of inclusion. Ensure that all team members feel included, regardless of their location.	Helps to overcome the challenges of configuration dispersion.

2.8 Conclusion

This chapter examined how to create effective and enjoyable work environments for dispersed teams by studying ARHS employees, with primary findings and implications listed afterwards.

The study identifies two primary team configurations: the siloed approach, which consists of collocated sub-teams working on distinct project segments, and the integrated approach, where dispersed members collaborate on the entire project. Each approach presents its pros and cons, with the choice between them being dependent on specific conditions and contexts. This sheds light on the diverse ways organisations can structure their dispersed teams in practice, enabling researchers and practitioners to explore factors that optimise team performance and satisfaction across various contexts, thus enriching the broader discourse on remote collaboration.

The success of dispersed teams relies on trust among members and effective leadership. Trust involves cognitive aspects (e.g., expertise, reliability) and affective components (e.g., pleasure in collaboration). Leaders maintain trust by emphasising relationship-based trust (interaction quality) and character-based trust (personal qualities, values), underscoring their importance in fostering positive remote work environments.

Moreover, the empirical findings challenge the notion that distance is no longer relevant, illustrating that geographical separation continues to influence team dynamics. Remote team members often feel less connected due to limited informal interactions and absent social cues. While video conferencing technology offers some benefits, it cannot fully replace face-to-face interactions. This insight adds a more grounded perspective on the challenges faced by dispersed teams and potential strategies for overcoming these hurdles.

Additionally, the examination of personal preferences and willingness to work in distributed team settings highlights the importance of considering individual differences when managing dispersed teams. This insight enriches the overall argument by demonstrating the need to recognise and accommodate the unique needs and preferences of team members to establish a supportive and inclusive work environment.

While project management plays a key role, the contribution of the company management to create a positive environment for dispersed teams cannot be overlooked. Smooth operations of such teams can be supported by robust IT support, clear guidelines, and regular meet ups. For ARHS, the creation of a horizontal unit has been instrumental in assisting various teams, both dispersed and collocated.

In conclusion, the ARHS case study’s key findings largely align with the existing scientific literature on dispersed teams, particularly concerning trust and leadership. This alignment offers valuable practical insights that both validate and extend the current knowledge, contributing to a deeper understanding of the challenges faced by dispersed teams in the IT sector.

Conclusion

The aim of this study was to explore the feasibility and conditions under which geographically distant individuals can effectively collaborate as a team while maintaining a sense of enjoyment. In the pursuit of answering this research question, a comprehensive literature review was conducted and an empirical study was carried out within the context of the IT sector at ARHS Developments. This concluding chapter synthesises the key insights derived from both the literature review and empirical investigation, and discusses their implications for the broader field of study.

The literature review in Chapter 1 offered a thorough analysis of the factors that contribute to the success of geographically dispersed teams, highlighting the significance of trust, communication, leadership, technology, and process management. Trust, as the backbone of team cohesion, is a multifaceted concept that encompasses both cognitive and emotional dimensions. Efficient communication through both formal and informal channels is crucial for remote teams, given the absence of in-person interactions and non-verbal cues. Leadership, particularly transformational and empowering styles, is essential in providing structure, direction, and motivation for the team. Technology acts as an enabler for communication and collaboration, assisting in overcoming challenges posed by distance. Ensuring access to information and implementing well-structured processes bolster the overall productivity of dispersed teams.

The empirical study in Chapter 2 focused on the experiences of dispersed team members at ARHS Developments. The research revealed two main team configurations: the siloed approach, which divides a project into distinct segments and assigns each to a collocated team, and the integrated approach, which involves dispersed team members collaborating on the entire project. Both approaches have their strengths and weaknesses, and the optimal choice depends on the specific circumstances.

Trust and leadership were found to play crucial roles in the success of dispersed teams. Maintaining trust requires both relationship-based and character-based factors, with leaders playing a vital role in fostering trust, encouraging collaboration, and facilitating communication. Distance still affects team dynamics, with remote members feeling less connected due to limited informal interactions and missing social cues. Video conferencing can help but cannot fully replace in-person interactions. Considering individual differences is essential for creating a supportive and inclusive environment that contributes to better remote team effectiveness and enjoyment.

The main findings from both the literature review and empirical research converge on the importance of trust, communication, leadership, technology, and individual differences in creating successful and enjoyable dispersed teams. These factors, when properly managed and balanced, can lead to high-performing and satisfying team experiences for individuals working

in geographically dispersed settings. Nevertheless, it appears from the empirical study that in terms of socialisation, collocated team settings continue to surpass their dispersed counterparts.

The empirical part also underscores the role of company management in cultivating a positive environment for dispersed teams. Several strategies can be used at this level to support such teams, including providing robust remote work infrastructure and spreading guidelines and best practices to all team managers and members. It is the responsibility of the company management to inform managers about the different potential team configurations outlined earlier, and to ensure they understand their roles in determining and shaping a particular team structure.

Drawing on the diverse findings presented in this study and my own experience, a comprehensive “cookbook” has been developed to provide managers with specific recommendations for managing dispersed teams. Its goal is to offer tangible strategies that can be implemented to cultivate efficient and enjoyable work environments for dispersed teams.

The findings of this master thesis have several important implications for the field of study. The identification of two primary team configurations and their respective advantages and drawbacks offers valuable insights to organisations seeking to optimise team performance and satisfaction. Additionally, the research highlights the crucial roles of trust and leadership in establishing and maintaining a high-performing and enjoyable dispersed team. Despite advances in communication technology, the research emphasises the continued relevance of geographical distance, thereby necessitating strategies to mitigate its negative impacts on team dynamics. Furthermore, the importance of individual differences underscores the need for managers to recognise and accommodate the unique needs and preferences of team members in order to foster an inclusive and supportive work environment.

In summary, this master thesis provides evidence that with proper conditions and management, dispersed teams can function effectively and find enjoyment in their work, despite the need for further improvement in socialisation and coaching/learning aspects. Following the guidelines presented in the “cookbook” can help the managers in the IT industry and beyond to create an environment that promotes success, satisfaction, and enjoyment for their dispersed teams.

Bibliography

Abbas, W., & Asghar, I. (2010). The Role of Leadership in Organizational Change: Relating the Successful Organizational Change with Visionary and Innovative Leadership.

Alderfer, C. P., & Smith, K. K. (1982). Studying intergroup relations embedded in organizations. Administrative Science Quarterly, 27, 35–65. https://doi.org/10.2307/2392545

Allen, T. J. (1977). Managing the flow of technology: Technology transfer and the dissemination of technological information within the R&D organization. MIT Press.

ARHS Group. (2022). Annual report 2022. https://indd.adobe.com/view/publication/ff4d0925-af65-43e0-bf93-49dedec0c6ec/21ob/publication-web-resources/pdf/ARHS-AR-2022-A4_screenview.pdf

Balthazard, P., Potter, R. E., & Warren, J. (2004). Expertise, extraversion and group interaction styles as performance indicators in virtual teams: How do perceptions of IT's performance get formed? ACM SIGMIS Database: The DATABASE for Advances in Information Systems, 35(1), 41–64. https://doi.org/10.1145/968464.968469

Bell, B. S., & Kozlowski, S. W. J. (2002). A Typology of Virtual Teams: Implications for Effective Leadership. Group & Organization Management, 27(1), 14–49. https://doi.org/10.1177/1059601102027001003

Bell, B. S., & Kozlowski, S. W. J. (2008). Active learning: Effects of core training design elements on self-regulatory processes, learning, and adaptability. Journal of Applied Psychology, 93, 296–316. https://doi.org/10.1037/0021-9010.93.2.296

Bergiel, B., Bergiel, E., & Balsmeier, P. (2008). Nature of virtual teams: A summary of their advantages and disadvantages. Management Research News, 31, 99–110. https://doi.org/10.1108/01409170810846821

Boughzala, I., de Vreede, G.-J., & Limayem, M. (2012). Team Collaboration in Virtual Worlds: Editorial to the Special Issue. Journal of the Association for Information Systems (JAIS), 13. https://doi.org/10.17705/1jais.00313

Boyer O'Leary, M., Wilson, J. M., & Metiu, A. (2011). Beyond Being There: The Symbolic Role of Communication and Identification in the Emergence of Perceived Proximity in Geographically Dispersed Work. ESSEC Working Papers, Article WP1112. https://ideas.repec.org//p/ebg/essewp/dr-11012.html

Carlson, J. R., & Zmud, R. W. (1999). Channel Expansion Theory and the Experiential Nature of Media Richness Perceptions. Academy of Management Journal, 42(2), 153–170. https://doi.org/10.5465/257090

Carmel, E., & Agarwal, R. (2001). Tactical approaches for alleviating distance in global

software development. IEEE Software, 18(2), 22–29. https://doi.org/10.1109/52.914734

Colquitt, J. A., Scott, B. A., & LePine, J. A. (2007). Trust, trustworthiness, and trust propensity: A meta-analytic test of their unique relationships with risk taking and job performance. The Journal of Applied Psychology, 92(4), 909–927. https://doi.org/10.1037/0021-9010.92.4.909

Cramton, C. D. (2001). The Mutual Knowledge Problem and Its Consequences for Dispersed Collaboration. Organization Science, 12(3), 346–371.

Cramton, C. D., & Webber, S. S. (2005). Relationships among geographic dispersion, team processes, and effectiveness in software development work teams. Journal of Business Research, 58(6), 758–765. https://doi.org/10.1016/j.jbusres.2003.10.006

Cummings, J. N. (2008). Leading groups from a distance: How to mitigate consequences of geographic dispersion. In Leadership at a distance: Research in technologically-supported work. (pp. 33–50). Lawrence Erlbaum Associates Publishers.

Cummings, J. N., & Haas, M. R. (2012). So many teams, so little time: Time allocation matters in geographically dispersed teams. Journal of Organizational Behavior, 33, 316–341. https://doi.org/10.1002/job.777

Deeb, G. (2020). The Pluses And Minuses Of Virtual Teams. Forbes. https://www.forbes.com/sites/georgedeeb/2020/05/04/the-pluses--minuses-of-virtual-teams/

Dennis, A., & Valacich, J. (1999). Rethinking Media Richness: Towards a Theory of Media Synchronicity. In Proceedings of the 32nd Hawaii International Conference on System Sciences (Vol. 1). https://doi.org/10.1109/HICSS.1999.772701

DeRosa, D. M., Hantula, D. A., Kock, N., & D'Arcy, J. (2004). Trust and leadership in virtual teamwork: A media naturalness perspective. Human Resource Management, 43(2–3), 219–232. https://doi.org/10.1002/hrm.20016

Dirks, K. T., & Ferrin, D. L. (2002). Trust in leadership: Meta-analytic findings and implications for research and practice. Journal of Applied Psychology, 87, 611–628. https://doi.org/10.1037/0021-9010.87.4.611

Dube, S., & Marnewick, C. (2016). A conceptual model to improve performance in virtual teams. SA Journal of Information Management, 18. https://doi.org/10.4102/sajim.v18i1.674

Earley, P. C., & Mosakowski, E. (2000). Creating Hybrid Team Cultures: An Empirical Test of Transnational Team Functioning. The Academy of Management Journal, 43(1), 26–49. JSTOR. https://doi.org/10.2307/1556384

Espinosa, J., Slaughter, S., Kraut, R., & Herbsleb, J. (2007). Team Knowledge and Coordination in Geographically Distributed Software Development. J. of Management Information Systems, 24, 135–169. https://doi.org/10.2753/MIS0742-1222240104

Fang, Y., Neufeld, D., & Zhang, X. (2022). Knowledge coordination via digital artefacts in highly dispersed teams. Information Systems Journal, 32(3), 520–543. ABI/INFORM Collection. https://doi.org/10.1111/isj.12358

Festinger, L., Schachter, S., & Back, K. (1950). Social pressures in informal groups; a study of human factors in housing (pp. x, 240). Harper.

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. Journal of Applied Psychology, 92, 1524–1541. https://doi.org/10.1037/0021-9010.92.6.1524

Gassmann, O., & von Zedtwitz, M. (2003). Innovation Processes in Transnational Corporations. University of St.Gallen. https://doi.org/10.1016/B978-008044198-6/50048-6

Gibson, C. B., & Cohen, S. G. (2003). Virtual Teams That Work: Creating Conditions for Virtual Team Effectiveness. John Wiley & Sons.

Gibson, C., & Gibbs, J. (2006). Unpacking the Concept of Virtuality: The Effects of Geographic Dispersion, Electronic Dependence, Dynamic Structure, and National Diversity on Team Innovation. Administrative Science Quarterly - ADMIN SCI QUART, 51, 451–495. https://doi.org/10.2189/asqu.51.3.451

Gray, R. (2004). How People Work: And how You Can Help Them to Give Their Best. Pearson Education.

Grinter, R. E., Herbsleb, J. D., & Perry, D. E. (1999). The geography of coordination: Dealing with distance in R&D work. Proceedings of the 1999 ACM International Conference on Supporting Group Work, 306–315. https://doi.org/10.1145/320297.320333

Hertel, G., Geister, S., & Konradt, U. (2005). Managing virtual teams: A review of current empirical research. Human Resource Management Review, 15(1), 69–95. https://doi.org/10.1016/j.hrmr.2005.01.002

Hinds, P. J., & Mortensen, M. (2005). Understanding Conflict in Geographically Distributed Teams: The Moderating Effects of Shared Identity, Shared Context, and Spontaneous Communication. Organization Science, 16, 290–307. https://doi.org/10.1287/orsc.1050.0122

Hinds, P., & Kiesler, S. (Eds.). (2002). Distributed work. MIT Press.

Horwitz, F., Bravington, D., & Silvis, U. (2006). The promise of virtual teams: Identifying key factors in effectiveness and failure. Journal of European Industrial Training, 30, 472–494. https://doi.org/10.1108/03090590610688843

Ijsselsteijn, W. A., Ridder, de, H., Freeman, J., & Avons, S. E. (2000). Presence: Concept, determinants and measurement: conference; Human vision and Electronic Imaging V; 2000-01-24; 2000-01-27. Human Vision and Electronic Imaging V, January 24-27, 2000, San Jose,

USA, 520–529.

Jacobson, D. (1999). Impression Formation in Cyberspace: Online Expectations and Offline Experiences in Text-based Virtual Communities. Journal of Computer-Mediated Communication, 5(1), JCMC511. https://doi.org/10.1111/j.1083-6101.1999.tb00333.x

Jarvenpaa, S., & Leidner, D. (1998). Communication and Trust in Global Virtual Teams. J. Computer-Mediated Communication, 3. https://doi.org/10.1111/j.1083-6101.1998.tb00080.x

Joinson, C. (2002, June 1). Workplace Trends: Managing Virtual Teams. SHRM. https://www.shrm.org/hr-today/news/hr-magazine/pages/0602joinson.aspx

Julsrud, T. E. (2008). Trust across Distance: A network approach to the development, distribution and maintenance of trust in distributed work groups [Doctoral thesis, Fakultet for samfunnsvitenskap og teknologiledelse]. https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/268069

Kahai, S. S., & Cooper, R. B. (2003). Exploring the Core Concepts of Media Richness Theory: The Impact of Cue Multiplicity and Feedback Immediacy on Decision Quality. Journal of Management Information Systems, 20(1), 263–299. JSTOR.

Katzenbach, J., & Smith, D. (2005). The Discipline of Teams. Harvard Business Review, 71, 111–120.

Kauffmann, D. (2015). How Team Leaders Can Improve Virtual Team Collaboration Through Trust and ICT: A Conceptual Model Proposition. Economics and Business Review, 1. https://doi.org/10.18559/ebr.2015.2.3

Kiesler, S., & Cummings, J. N. (2002). What do we know about proximity and distance in work groups? A legacy of research. In Distributed work (pp. 57–80). Boston Review. https://doi.org/10.7551/mitpress/2464.001.0001

Kiesler, S., Siegel, J., & McGuire, T. W. (1984). Social psychological aspects of computer-mediated communication. American Psychologist, 39, 1123–1134. https://doi.org/10.1037/0003-066X.39.10.1123

Kimble, C., Barlow, A., & Li, F. (2005). Effective Virtual Teams through Communities of Practice. Industrial Organization, Article 0504006. https://ideas.repec.org//p/wpa/wuwpio/0504006.html

Kirkman, B. L., & Rosen, B. (1999). Beyond self-management: Antecedents and consequences of team empowerment. Academy of Management Journal, 42, 58–74. https://doi.org/10.2307/256874

Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the Effectiveness of Work Groups and Teams. Psychological Science in the Public Interest, 7, 77–124. https://doi.org/10.1111/j.1529-

1006.2006.00030.x

Kraut, R. E., Fussell, S. R., Brennan, S. E., & Siegel, J. (2002). Understanding effects of proximity on collaboration: Implications for technologies to support remote collaborative work. In Distributed work. (pp. 137–162). Boston Review. https://doi.org/10.7551/mitpress/2464.001.0001

Lewicki, R., & Bunker, B. (1995). Trust in Relationships: A Model of Development and Decline. In Research on Negotiation in Organizations (Vol. 5, pp. 283–305). JAI Press.

Lipnack, J., & Stamps, J. (1997). Virtual Teams: Reaching Across Space, Time, and Organizations with Technology (1st edition). Wiley.

Lojeski, K., Reilly, R., & Dominick, P. (2006). The Role of Virtual Distance in Innovation and Success. In Proceedings of the Annual Hawaii International Conference on System Sciences (Vol. 1, p. 25c). https://doi.org/10.1109/HICSS.2006.484

Majchrzak, A. & Malhotra, A. (2006, March 31). Teams across borders Careful management of globally dispersed teams has become an essential skill. Financial Times, 11. ABI/INFORM Collection.

Martins, L. L., Gilson, L. L., & Maynard, M. T. (2004). Virtual teams: What do we know and where do we go from here? Journal of Management, 30, 805–835. https://doi.org/10.1016/j.jm.2004.05.002

Mathieu, J. E., Luciano, M. M., & DeChurch, L. A. (2018). Multiteam systems: The next chapter. In The SAGE handbook of industrial, work & organizational psychology: Organizational psychology, Vol. 2, 2nd ed. (pp. 333–353). Sage Reference.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. The Academy of Management Review, 20(3), 709–734. JSTOR. https://doi.org/10.2307/258792

Maznevski, M. L., & Chudoba, K. M. (2000). Bridging space over time: Global virtual team dynamics and effectiveness. Organization Science, 11, 473–492. https://doi.org/10.1287/orsc.11.5.473.15200

McAllister, D. J. (1995). Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations. The Academy of Management Journal, 38(1), 24–59. JSTOR. https://doi.org/10.2307/256727

McGrath, J. E. (1990). Time matters in groups. In Intellectual teamwork: Social and technological foundations of cooperative work. (pp. 23–61). Lawrence Erlbaum Associates, Inc.

McKnight, D. H., Cummings, L. L., & Chervany, N. L. (1998). Initial Trust Formation in New

Organizational Relationships. The Academy of Management Review, 23(3), 473–490. JSTOR. https://doi.org/10.2307/259290

Meyerson, D., Weick, K. E., & Kramer, R. M. (1996). Swift trust and temporary groups. In Trust in organizations: Frontiers of theory and research (pp. 166–195). Sage Publications, Inc. https://doi.org/10.4135/9781452243610.n9

Monge, P. R., & Kirste, K. K. (1980). Measuring Proximity in Human Organization. Social Psychology Quarterly, 43(1), 110–115. https://doi.org/10.2307/3033753

Murphy, K., & Collins, M. (1997). Communication Conventions in Instructional Electronic Chats. First Monday, 2. https://doi.org/10.5210/fm.v2i11.558

Nemeth, C. J. (1986). Differential contributions of majority and minority influence. Psychological Review, 93, 23–32. https://doi.org/10.1037/0033-295X.93.1.23

Ojala, M. (2004). Being virtual: Characteristics of virtual teams and their leadership. Academy of Management Perspectives, 18(1), 60–70.

O'Leary, M. B., & Cummings, J. N. (2007). The Spatial, Temporal, and Configurational Characteristics of Geographic Dispersion in Teams. MIS Quarterly, 31(3), 433–452. JSTOR. https://doi.org/10.2307/25148802

Panteli, N., & Tucker, R. (2009). Power and trust in global virtual teams. Communications of the ACM, 52(12), 113–115. https://doi.org/10.1145/1610252.1610282

Paul, D. L., & McDaniel, R. R. (2004). A Field Study of the Effect of Interpersonal Trust on Virtual Collaborative Relationship Performance. MIS Quarterly, 28(2), 183–227. JSTOR. https://doi.org/10.2307/25148633

Pazos, P. (2012). The Impact of Online Collaboration Spaces on Virtual Team Outcomes.

Peters, L. M., & Manz, C. C. (2007). Identifying antecedents of virtual team collaboration. Team Performance Management: An International Journal, 13(3/4), 117–129. https://doi.org/10.1108/13527590710759865

Porter, L. W., & Lawler, E. E. (1968). Managerial attitudes and performance. R.D. Irwin. https://bac-lac.on.worldcat.org/oclc/301652826

Powell, A., Piccoli, G., & Ives, B. (2004). Virtual teams: A review of current literature and directions for future research. ACM SIGMIS Database: The DATABASE for Advances in Information Systems, 35(1), 6–36. https://doi.org/10.1145/968464.968467

Sarker, S., Ahuja, M., Sarker, S., & Kirkeby, S. (2011). The Role of Communication and Trust in Global Virtual Teams: A Social Network Perspective. J. of Management Information Systems, 28, 273–309. https://doi.org/10.2307/41304612

Schaubroeck, J., Lam, S. S. K., & Peng, A. C. (2011). Cognition-based and affect-based trust as mediators of leader behavior influences on team performance. Journal of Applied Psychology, 96, 863–871. https://doi.org/10.1037/a0022625

Short, J., Williams, E., & Christie, B. (1976). The Social Psychology of Telecommunications. Wiley.

Silveira Reis, R., Quental, C., & van Heck, E. (2022). When Three Is Better than Two: How Culture Can Bridge Collaboration in Globally Distributed Teams. M@n@gement, 25(3), 57–73.

Sproull, L., & Kiesler, S. (1986). Reducing Social Context Cues: Electronic Mail in Organizational Communications. Management Science, 32(11), 1492–1512.

Wakefield, R. L., Leidner, D. E., & Garrison, G. (2008). A model of conflict, leadership, and performance in virtual teams. Information Systems Research, 19, 434–455. https://doi.org/10.1287/isre.1070.0149

Warkentin, M., Sayeed, L., & Hightower, R. (1997). Virtual Teams versus Face-to-Face Teams: An Exploratory Study of a Web-based Conference System*. Decision Sciences, 28, 975–996. https://doi.org/10.1111/j.1540-5915.1997.tb01338.x

Watson, W. E., Kumar, K., & Michaelsen, L. K. (1993). Cultural Diversity's Impact on Interaction Process and Performance: Comparing Homogeneous and Diverse Task Groups. The Academy of Management Journal, 36(3), 590–602. https://doi.org/10.2307/256593

Wiesenfeld, B., Raghuram, S., & Garud, R. (2001). Organizational Identification among Virtual Workers: The Role of Need for Affiliation and Perceived Work-Based Social Support. Journal of Management - J MANAGE, 27, 213–229. https://doi.org/10.1016/S0149-2063(00)00096-9

Wilson, J. M., Boyer O'Leary, M., Metiu, A., & Jett, Q. R. (2008). Perceived Proximity in Virtual Work: Explaining the Paradox of Far-but-Close. Organization Studies, 29(7), 979–1002. https://doi.org/10.1177/0170840607083105

Wong, S.-S., & Burton, R. (2000). Virtual Teams: What are their Characteristics, and Impact on Team Performance? Computational & Mathematical Organization Theory, 6, 339–360. https://doi.org/10.1023/A:1009654229352

World Economic Forum. (2020). The Future of Jobs Report 2020. World Economic Forum. https://www.weforum.org/reports/the-future-of-jobs-report-2020/

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. Journal of Personality and Social Psychology, 9(2, Pt.2), 1–27. https://doi.org/10.1037/h0025848

Zigurs, I. (2003). Leadership in Virtual Teams: - Oxymoron or Opportunity? Organizational Dynamics, 31.

Appendices

Annex A. Influencers and enablers: a summary of literature review findings

FACTOR	EFFECTS	RECOMMENDATIONS
DISTANCE	- Reduces communication; - Reduces socialisation; - Reduces trust; - Reduces mutual understanding; - Affects coordination; - Reduces feeling of "teamness" (i.e., increases feeling of isolation).	- Prioritise functional and perceived proximity; - Leverage appropriate communication technologies; - Foster a sense of community and trust; - Establish clear goals and roles; - Foster a team culture that values open communication and mutual support; - Meet face-to-face occasionally.
TIME	- Increases communication breakdowns; - Reduces mutual misunderstanding; - Increases delay to get answer, and hence frustration; - Allows work around the clock and hence faster completion of tasks; - Reduces distractions and interruptions; - Increases autonomy and flexibility.	- Leverage appropriate communication technologies; - Establish clear communication protocols and goals to ensure mutual understanding; - Schedule team meetings that accommodate the needs and timetables of all team members.
CULTURE	- Reduces mutual understanding. - Brings more creative solutions.	- Establish clear lines of communication and make sure everyone is speaking the same language; - Provide cross-cultural training; - Create a sense of shared identity or "teamness".
ORGANISATION	- Disrupts team harmony due to conflicting priorities and decision-making powers; - Causes confusion about who to approach; - Increases miscommunication; - Increases inefficiency and frustration.	- Establish precise communication protocols; - Cultivate a culture of trust among team members; - Define explicit goals and performance metrics
CONFIGURATION	Balanced configurations can lead to increased intergroup relations and collaboration, while imbalanced configurations	- Manage team size and diversity; - Foster effective communication;

	may trigger the majority-minority effect and decrease awareness of activities.	- Encourage social interaction.
NATURE OF THE TASK	- Complex, non-routine tasks are more challenging for dispersed teams. - Task interdependence makes coordination and communication more challenging for dispersed teams.	- Building trust and promoting open communication; - Using appropriate technology; - Developing clear communication protocols and guidelines
TECHNOLOGY	- Can foster social presence; - Promotes a sense of belonging; - Increases trust.	- Choose communication tools that are suitable for the type of communication needed (e.g., task-oriented versus relationship-oriented); - Adapt technology iteratively to the team's needs and develop effective communication skills in evolving environments; - Incorporate symbols and language during electronic communication, such as emoticons and bold typeface, to express emotions and maintain social presence.
TRUST	- Increases collaboration and knowledge sharing, - Increases satisfaction.	- Establish clear communication and information sharing channels; - Create opportunities for social interaction through informal conversations; - Define and maintain clear and well-defined role divisions among team members to prevent a breakdown in trust; - Choose appropriate communication technology; - Ensure effective and positive leadership.
LEADERSHIP	- Promote communication; - Enhance team culture; - Increase trust; - More effective use of technology.	- Provide clear communication about expectations, deadlines, and goals; - Establish guidelines on how to communicate; - Be more explicit in communication to ensure that team members understand each other and establish guidelines for communication; - Balance task-oriented and people-oriented leadership to manage team performance and promote a positive team culture. - Develop knowledge and skills in ICT to impact the effective use of

	technology in the team.

Annex B. Interview form

The following table presents the questions that served as a framework for conducting the semi-structured interviews.

THEME	QUESTION	APPLICABLE TO
GENERAL	Have you worked in a dispersed team before? If so, the next questions apply: - What was the size of the team? - How were the people distributed among the different sites? - Where were the people located? - What was your role in the team?	Any role
	Do you feel that it is different than working in a collocated team? If so, why?	Any role
	What were some of the challenges you faced when working on a distributed team?	Any role
	What were some of the strategies that you used to overcome these challenges?	Any role
	What are some of the benefits of working on a dispersed team?	Any role
	Do you feel that dispersed teams are more or less effective/enjoyable than co-located teams? Why?	Any role
	Did you enjoy working remotely with geographically apart team members? If yes, why? If no, why not?	Any role
	What are some of the key factors that contribute to an effective geographically distributed team?	Any role
	What suggestions do you have to make remote team collaboration more effective and enjoyable?	Any role
	Did the fact that the team is distributed play a role in your work at ARHS (in terms of integration, learning, etc.)?	Any role
	Do you manage differently a team which is collocated than a team which is dispersed?	Project managers only
	Do you implement any specific things for distributed teams, and if so, what?	Project managers only
	Do the elements you consider for forming a dispersed team differ from those for forming a co-located team?	Project managers only
	How do you address feelings of isolation or disconnection that may arise when working remotely or in a distributed team?	Project managers only
PERCEIVED PROXIMI	How connected do you feel to your remote team members?	Any role
	How do you maintain a sense of connection with remote team members, despite physical distance?	Any role
	Do you sometimes feel excluded from the other part of the team?	Any role
	How do you manage team building and bonding activities in a distributed team?	Team leaders, project

		managers
COMMUNICATION	Do you feel that it is more difficult to communicate with your remote colleagues?	Any role
	Have you ever experienced miscommunication or misunderstandings in a dispersed team? If so, can you provide an example and explain how it was resolved?	Any role
	How do you communicate with your team members?	Any role
	What tools or technologies did you use to communicate with your team members?	Any role
	How do you ensure that everyone on the team is on the same page when working remotely?	Team leaders, project managers
	Have you experienced any challenges or barriers to effective communication in a dispersed team? If so, how did you address them?	Any role
	How do you handle conflicts or disagreements that arise in a dispersed team, particularly when communication is not face-to-face?	Any role
TRUST	How do you build trust and a sense of camaraderie with your remote team members?	Any role
	Have you ever experienced a situation where trust was broken in a distributed team? If so, can you describe the situation and how it was resolved?	Any role
	In your experience, what are the most effective strategies for building trust among team members who have never met face-to-face?	Any role
SHARED IDENTITY	Do you feel like you share a strong sense of identity with your remote team members?	Any role
	How do you promote a sense of inclusivity and belonging in a distributed team?	Any role
	How do you align team goals and values in a remote distributed team to create a sense of shared purpose?	Team leaders, project managers
	How do you celebrate successes and achievements as a team in a distributed environment?	Any role
	Have you noticed any differences in the motivation and commitment of team members who feel a strong sense of shared identity compared to those who do not? If so, how do you think this impacts team performance?	Team leaders, project managers
LEADERSHIP	In your opinion, what are the most important skills and qualities for a leader in a distributed team to possess?	Any role
	In your experience, what are the key challenges of leading a distributed team?	Team leaders, project managers

	How do you establish and maintain authority as a leader in a dispersed team?	Team leaders, project managers
	What strategies have you found to be effective for motivating and engaging team members in a distributed team?	Team leaders, project managers
	How do you manage conflicts and difficult conversations in a distributed team?	Team leaders, project managers
	What are some effective ways to give feedback to team members in a distributed team?	Team leaders, project managers
	Have you noticed any differences in the role of leadership in distributed teams compared to those who work in the same physical location?	Team leaders, project managers
	How do you ensure that team members in a distributed team are aligned with the organisation's goals and values?	Team leaders, project managers
	How do you ensure that everyone on the team is working towards the same goals and objectives?	Team leaders, project managers
TECHNOLOGY	What technologies do you use to communicate in a dispersed team?	Any role
	In your opinion, what are the most important features that technology should have to support dispersed teams?	Any role
	How do you ensure that team members are comfortable with and capable of using the technology required for their work?	Team leaders and project managers
	How do you deal with situations where team members have different levels of proficiency with technology in a dispersed team?	Team leaders and project managers
	How do you balance the need for technology with the need for face-to-face communication and collaboration in a remote/distributed team?	Any role
	Do you use different types of communication depending on the situation? If so, how do you do this?	Any role
NATURE OF THE TASK	Have you ever worked on a task that was particularly challenging to complete in a remote/distributed team? If so, can you describe the situation and how it was addressed?	Any role
	In your experience, what types of tasks are best suited for remote/distributed teams?	Any role
	Have you ever encountered situations where team members have different levels of expertise or experience with the task?	Any role

	If so, can you describe the situation and how it was addressed?	
SELECTION OF TEAM MEMBERS	In your opinion, what are the most important skills for dispersed team members to possess?	Any role
CONFIGURATION	What about the selection of team members?	Project managers only
	Do you feel like you are part of one big team, or do you feel like you belong to one team composed of people near you and another team located far from you?	Any role
	Do you feel a sense of belonging and connection with all team members, regardless of their physical location, or do you feel a greater connection to team members who are located closer to you? How do you manage or cope with any feelings of disconnection or isolation that may arise from this?	Any role
	Do you sometimes feel like you’re not part of the team (isolation)? If so, can you describe the situation and how you coped with these feelings?	Any role

Annex C. Summary of interview

The following reports provide a summary of the individual interviews conducted with different profiles within the ARHS. These interviews were performed to gather information about the structure of the team, the difficulties encountered and the experiences of working in a remote team.

To better understand the current roles of the interviewees, a visual representation has been created in Figure 5. This illustration highlights the three main career paths available in the current ARHS model and the corresponding levels for each pathway. It is worth mentioning that entry into the project management path typically requires progressing through either the analysis or development paths first. While there are other career tracks within ARHS, they have not been included in the figure since none of the interviewees currently hold those roles.

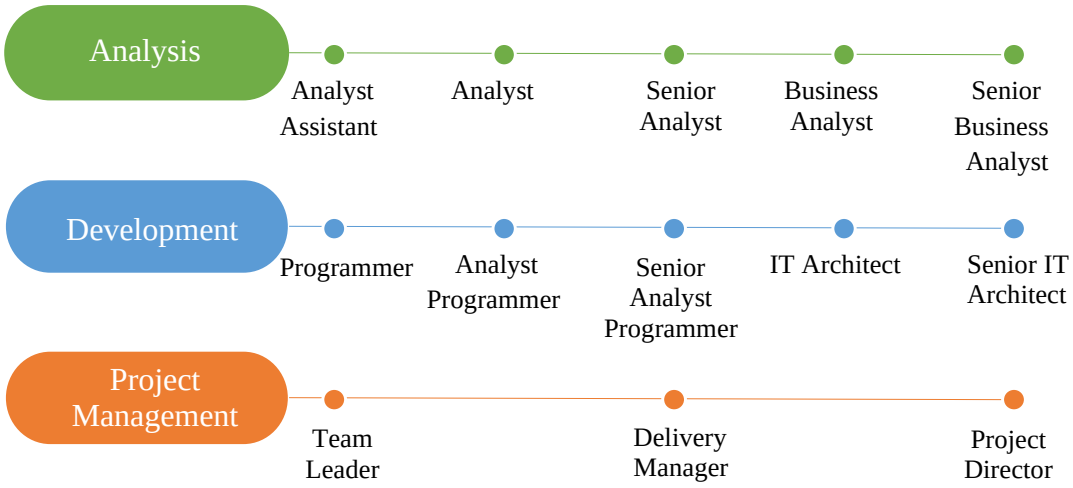

Figure 5. Simplified ARHS career path.

Annex C.1. Virginie – Senior Analyst in Belgium

Interview details: Conducted in-person in Brussels on March 9, 2023.

Profile: Virginie has been working as an analyst at ARHS for 4 and a half years, primarily working on the Europass project with an on-site team of developers. In the past year, she has shifted to working on the same project with a dispersed team, with approximately half of the team members located in Greece. This transition was due to a high need for developers that could not be found in Belgium. Although this was not the management's initial preference, it was the only viable option in the short term.

Virginie is an experienced and highly involved member of the Europass project team. She works closely with other team members to ensure the success of the project. Her extensive expertise in the Europass project, which she has worked on since its inception, makes her a valuable resource for the team.

Team configuration: The team comprises a group of software developers split between Greece and Belgium, with an equal number in each country. In addition to developers, the team includes a few project managers, a tester, and a couple of business analysts based in Belgium. The team consists of a mix of experienced and junior members, with some Greek team members working in different cities, such as Athens and Thessaloniki, which are approximately 500 km away

Management is primarily on-site in Belgium, and there are two team leaders – one in Belgium and one in Greece – both included in the developer count. Initially, the Greek team leader did not have a management role but has gradually taken on more responsibilities.

It is crucial to emphasise the team's unique context. They did not begin as a distributed team but transitioned to this model due to resource constraints, presenting challenges that Virginie frequently mentioned during the interview.

Dispersion: In terms of dispersion, this team ticks almost all the boxes: firstly, there is geographical dispersion, as the team members are located in different countries. In addition, there is temporal dispersion, albeit minor, with only a one-hour time difference between the two countries. Cultural differences also exist within the team. Finally, the team is dispersed in terms of configuration: the team is dispersed across three sites, with one team member isolated without colleagues at their site, and the majority of team members situated in Brussels.

Findings: The different topics discussed with Virginie were organised by theme after the conversation.

Communication

Virginie discusses the challenges and progress of communication within her dispersed team. At the beginning of the transition, it was challenging to explain the project to team members who were not on-site due to limited immediate communication. However, once the team integrated, they performed as well as the on-site team.

While communication can still be challenging at times, the team has developed routines for messaging and scheduling calls. Nevertheless, being in the same place still facilitates certain types of discussions (e.g., discussions on matters that are not "black and white", meaning matters that require a more nuanced approach, where there may be several possible solutions or interpretations). Additionally, calling someone can be more demanding and it is often easier to have face-to-face discussions over a cup of coffee. Virginie acknowledges that language can present a challenge to communication within a dispersed team. She notes that she may be more inclined to discuss certain issues with her on-site co-workers because they can speak French together and better express their ideas.

Still, she explains that when she has questions or issues to discuss within the dispersed team, she prioritises asking someone who is familiar with the specific ticket or problem, regardless of their location. This approach ensures that the person with the most relevant knowledge can

provide an effective solution. However, if someone from her office has the knowledge, she will naturally go to them instead of calling a remote team member.

Virginie also highlights the issue of remote colleagues being left out of minor discussions due to their physical absence. When on-site discussions occur, it is easier for someone not involved in the conversation to realise that they should be included. This is not the case with remote colleagues. However, she notes that it is possible to make a quick call to include them in the discussion, although she acknowledges that this is not done often. Furthermore, Virginie observes that the Greek team leader may struggle to follow along with discussions since he has not had the same amount of face-to-face interaction with the team as others have.

Overall, Virginie seems to suggest that communication in a dispersed team can be challenging, but with the right tools and practices, it can be managed effectively.

Culture

Virginie believes that the different culture between the two teams has not had any significant impact on the project and their collaboration. However, she notes that language can be a barrier to effective communication and fluid discussion, as previously mentioned.

Integration and cohesion

Virginie states that remote team members are now fully integrated into the team and are not limited to a specific part or module of the application, which was originally planned by the management. Instead, they are assigned the same tasks and estimations as the rest of the team, participate in demos, estimations, and other team activities. This approach has become standard and has allowed remote team members to comprehend the project and work smoothly with the rest of the team. Virginie sees the remote and in-person members as part of the same team, working towards a common goal.

Virginie also acknowledges that the level of knowledge of the team members in Greece was lower than that of the team members in Belgium, which was to be expected as the Belgian team members had prior knowledge. However, over time the team has become more balanced and Virginie now feels that the team is evenly distributed in terms of skill levels and competences.

In addition, Virginie notes that it is crucial to include dispersed team members in all team meetings and discussions to ensure they feel valued and engaged in the team’s work.

Socialisation

Virginie explains that she does not really have a social relationship with her remote colleagues from Greece, as she does not know them personally and does not keep in touch with them outside of work-related communications. She mentions that her interactions with them are always professional, unlike her interactions with her colleagues who are physically present in the office, with whom she can have more casual conversations and social interactions. However,

she admits that it is more enjoyable and easier to work with someone when you get along well with them personally. She believes that seeing her remote colleagues more often could improve their relationship and make communication smoother, which is important for the team's spirit and fluidity.

Virginie mentions that they had a work party where some remote colleagues from Greece attended, which was enjoyable for her to see them in person and made her feel closer to them. However, she notes that the atmosphere has since returned to normal, as they do not see each other.

Regarding virtual social events, Virginie discusses their effectiveness in creating a sense of connection among remote team members. She mentions a previous online event that went well but expresses her own discomfort with virtual gatherings and the difficulty of initiating conversation through a screen. She suggests that someone should manage the virtual event to ensure that everyone is engaged.

Virginie mentions that the team does not do anything specific to celebrate success or milestones in projects, and she finds it a bit of a shame. She explains that sometimes, during retrospectives, they acknowledge successes, but there is not really any formal celebration. It is difficult to do something with everyone because the remote members are not physically present, so the only option is virtual happy hours. However, she thinks it would be nice to do something more substantial to mark successes, such as going out for a drink or doing an activity together.

Virginie expresses a preference for working with a team that is entirely in one place, citing the importance of context and atmosphere in maintaining good relationships with colleagues. She also emphasises the importance of maintaining social links with colleagues, even when working remotely. Virginie also notes that good relationships can have a positive impact on work efficiency, as it is easier to collaborate with people you get on with.

Team leader

Virginie believes that the skills required for a team leader are the same, regardless of whether the team is collocated or dispersed, but team leaders need to be more vigilant in monitoring the work of team members who are not physically present. This is because in a remote setting, team members cannot simply turn around and ask for help or clarification. Instead, they must rely on technology to understand who is working on what, what progress has been made, and what issues may arise. As a result, team leaders need to ensure clear communication and consistent alignment to keep everyone on the same page when working in distributed teams.

Team members characteristics

Virginie acknowledges the importance of communication when working in a distributed team, and she believes that some people may not be suited for it. For example, people who do not like to be bothered or who do not communicate well may struggle in a remote team. Additionally,

some people may prefer to work independently and not be interrupted, which can be challenging when communication is essential. Virginie also notes that some people may have difficulty following procedures or may be resistant to feedback, which can be problematic in a remote team setting where communication and collaboration are critical.

Annex C.2. Quentin – Team Leader in Belgium

Interview details: Conducted in-person in Brussels on March 14, 2023.

Profile: Quentin has been a part of ARHS for 4 and a half years, initially joining as a software developer and then quickly taking on the role of a team leader in a collocated team in Luxembourg. When he moved to Belgium, he faced a new challenge of building a new team from scratch, which comprised both local and remote team members based in Greece. He is currently the team leader of this team. Note that this is the same team as the one described above, with Virginie.

Quentin is a very communicative leader who prioritises building strong relationships with his team members. He values transparency and encourages an environment of open and honest communication. He invests time and effort to ensure the smooth functioning of his team.

Team configuration: Quentin's team consists of a dozen developers divided between Greece and Belgium, with Quentin acting as the team leader. Additionally, the team includes a small group of project managers, business analysts, and a tester, all based in Belgium. To ensure effective communication and collaboration, the team utilise tools such as Teams and Jira.

Dispersion: This team is dispersed geographically, temporally, culturally, and in terms of configuration. The team members are located in different countries with a minor one-hour time difference. The team is dispersed across three sites, with one team member isolated without any colleagues at their site.

Findings: The different topics discussed with Quentin were organised by theme after the conversation.

Team configuration

Quentin shares his experience as a team leader for a distributed team composed of developers from Greece and Belgium. The team had to be rebuilt from scratch, requiring new processes and knowledge development. Initially, there were more Greek developers than Belgians, but the team composition remained roughly balanced.

The original plan was to split the team into two groups, each led by a dedicated team leader, while maintaining diversity within each group. The intention was to prevent forming separate teams consisting entirely of Belgian or Greek developers, each led by a team leader from the same nationality. This was to avoid fostering competition between the teams.

However, the Greek team leader did not immediately assume his role. As a result, Quentin took

on the responsibility of leading both teams, which consisted of a total of 12 people, a manageable size for effective leadership.

Leadership and communication

Quentin explains that when he initially worked with the Greek developers and asked them questions, they were reluctant to respond. Seeking advice from colleagues with prior experience managing distributed teams, he discovered that the Greek developers were often isolated from the rest of the team, assigned to specific application modules or tasks, and left to work independently for extended periods without collaboration or guidance. This approach created unnecessary competition between the teams and resulted in problems most of the time. Quentin also noted that the Greek developers had previously felt undervalued in their past projects involving remote teams, whether working with Belgian or Luxembourg counterparts.

To tackle these issues, Quentin assumed a leadership role for both Greek and Belgian developers, promoting collaboration between the two teams. He understood the need to adapt his communication style to work effectively with the Greek developers. Quentin is typically directive in meetings, and he often tones down his words during lunch or off-topic discussions with his Belgian colleagues, which are situations the Greek developers cannot experience as they are in remote. Consequently, the Greek team might feel pressured to deliver results promptly. Quentin shares an example when he informed the team they were behind schedule, leading the Greek developers to feel overwhelmed and work excessively. He then realised that he had not communicated the message in the same way to the Belgian team and learned the importance of being careful when communicating with different teams.

To improve communication, Quentin learned to provide clearer explanations, solicit input from team members, and encourage interaction during meetings. He also began sending follow-up messages with detailed clarifications when he realised his directive approach needed adjustment. Quentin recognised that distance could contribute to misunderstandings, although it primarily depends on the individual rather than the distance itself. Since it is more challenging to read reactions and expressions, clarity in explanations becomes crucial. He emphasised the importance of remembering that remote team members cannot see body language or off-camera behaviour, so sometimes additional explanations are necessary.

Quentin initiated one-to-one meetings with Greek developers to understand their individual experiences, goals, and challenges. In one case, he facilitated an employee’s relocation to Belgium by escalating the request to higher management. Quentin’s supportive approach made Greek developers more comfortable approaching him with their needs and requests. He treats all team members equally and ensures equal access to training and professional development opportunities

Quentin fosters a culture of fairness and equity by treating everyone equally and addressing both positive and negative performance with transparency. He achieves this through his daily

words and actions. Quentin stresses the significance of open communication, discussing mistakes, and commending individuals in front of the entire team. He explains that, while management often advises against singling out individuals in a group setting, failing to address an issue in front of others could lead to feelings of being targeted or unfairly treated, particularly for those in separate teams. Thus, it is crucial to communicate transparently and fairly.

Quentin believes that effective communication from management is key to managing remote teams successfully. He stresses the importance of patience and long-term perspective. He notes that the success of the remote team also depends on having the right people who are young, motivated, and willing to collaborate.

Cohesion

Quentin discusses the efforts made to promote a sense of inclusion and camaraderie among both Belgian and Greek team members. Although they do not frequently organise events, they have experimented with a few engaging activities such as an online game night featuring "Among Us" and a musical challenge called "Guess the Song". Quentin acknowledges the challenge of coming up with remote event ideas that are inclusive and enjoyable for everyone. While he does not regularly plan after-work events, team members engage in informal conversations about their personal lives, which has helped them bond.

Additionally, when a Belgian colleague departed, the Greek team was included in the farewell gift, even though they could not join the celebration in person. The goal is to ensure everyone feels included, even if they cannot participate in every event.

Building connections

Quentin admits that he feels more connected with his Belgian colleagues and regrets not being able to meet the Greek team members in person, as face-to-face interactions often facilitate better communication and stronger relationships. He suggests that if mixed teams could occasionally travel to meet in person, it would be advantageous. However, Quentin acknowledges that even without in-person meetings, they have successfully built a cohesive team.

Quentin discusses the improvement in communication within his team over time. He credits activities like playing "Among Us" and participating in company events with breaking the ice and fostering conversation. He observes an increase in off-topic discussions among team members, which is unusual at ARHS where most communication is work-related. Quentin emphasises the importance of embracing these conversations, even during work hours, as they provide opportunities for team bonding and deeper understanding of each other. He also notes that integrating new team members takes time, but once they feel included and heard, they are more likely to open up and share about their personal lives.

Conflict management

Quentin shares that he has not encountered many conflicts among the developers on his team. He attributes this to the team being new to the project, with no members resistant to change. Quentin also stresses the significance of fostering mutual trust and cultivating an environment where everyone feels at ease sharing their thoughts and opinions.

During a mid-appraisal, Quentin detected tension between two Greek developers, underscoring the value of one-to-one meetings. He also mentions that it is essential to be attentive to team members during meetings and to reach out to them if they appear to be disengaged.

Process and technology

Quentin describes how their communication tools and processes have evolved over time. Initially, they enforced the use of cameras during calls to help team members get to know each other better, but later made exceptions for those experiencing internet issues in Greece. Quentin believes that it is better to use fewer tools like Teams and Jira to avoid creating gaps between team members and mentions that pair programming happened naturally without enforcing nationality-based pairings.

Quentin explains that at the beginning of the project, they had a very strict follow-up process on Jira, and he would send messages every two days to remind team members to update the tickets. He emphasises the importance of communication and taking the time to explain the need for updates on Jira, but without making team members feel like they are being tracked. He mentions that he had to do this more for the team members who were not physically present with him, and he had to make them understand that there needs to be a common base of communication and synchronisation.

Personality and cultural differences

Quentin highlights the significance of considering individual personalities and cultural disparities when building a distributed team. He notes that introverted team members may face challenges with remote communication as they may struggle to share information. Furthermore, integrating team members from diverse cultures, such as Jordan or Bulgaria, can pose unique challenges, including scheduling conflicts due to religious practices. He stresses the importance of being open-minded and having a trustworthy team member on the other end to provide valuable feedback. Finally, Quentin points out that having too many leaders in a dispersed team can make synchronisation more challenging.

Annex C.3. Julien – Project Director in Luxembourg

Interview details: Conducted remotely via Microsoft Teams on March 17, 2023.

Profile: Julien has over 12 years of experience working at ARHS Developments. His journey started as a Java Developer, gradually progressing to become a Senior Java Software Developer. Julien has held a number of leadership positions, such as Team Leader, Delivery Manager, and Project Director. He initially worked in Brussels, and then moved to Luxembourg.

Throughout his career, Julien has worked on a variety of projects, collaborating with both co-located and dispersed teams, some of whose members were based in Luxembourg, Belgium, and Greece. His experience has honed his leadership skills, allowing him to manage teams, oversee project delivery, and establish positive client relationships. He also possesses technical expertise and in-depth knowledge of software development best practices.

As a leader, Julien is known for his pragmatic approach and focus on efficiency. He values effective communication and is willing to take the time to build relationships with colleague. He also prioritises responsibility and competence among team members, believing that clear processes and expectations are essential to maintain efficiency and accountability.

Team configuration: Julien has worked on various projects throughout his career, some of which involved dispersed teams and others that did not. Here are a few examples of projects in which he worked with dispersed teams:

Julien's first project at ARHS was with a team of three, including himself as a developer. After three months, one team member left for Italy, and Julien had to work with him remotely for three to six months, communicating for an average of two hours per day via Skype. According to Julien, this was not the most efficient way of working.

Julien then led a larger team on the Customs Decision System (CDS) project, which involved more people than his previous projects. The project involved conducting analysis in Brussels while development took place in Luxembourg. During this time, Julien was in Luxembourg and responsible for overseeing the team's delivery and progress. Having previously worked with the team in Belgium, he was familiar with their approach, skills, and working style, which made the process smoother. The project also benefited from regular face-to-face communication, with the analysts visiting Luxembourg from time to time to work on analysis together in a room with a whiteboard.

Julien also contributed to the European Travel Information and Authorisation System (ETIAS) project, which brought together teams from Greece and Luxembourg, and briefly from Belgium. Julien oversaw the progress of the project at a high level and checked that it was on track. He mainly led the team in Luxembourg, where he was based.

Dispersion: Based on the previous examples of projects that Julien has worked on, it is evident that he has encountered varying levels of dispersion, increasing in complexity over time. Initially, he experienced only geographical dispersion while working in a small team. Later, when he moved to Luxembourg, he worked on a project with physical dispersion, but this time with a much larger team and a specific setup where most of the team was in Luxembourg and a few members in Belgium (two sites). He also faced geographical, temporal, and cultural dispersion while working with a Greek team (two to three sites). It is also important to note that for most of these projects, other companies were involved, and it was necessary to work closely with the client, who was also part of another organisation, which highlights the presence of

organisational dispersion.

It is important to note that with the exception of the Greek team, Julien collaborated with people he knew or had met in person for the majority of these projects.

Findings: The different topics discussed with Julien were organised by theme after the conversation.

Importance of face-to-face communication

Julien shares his experience working on the CDS project, where there was a management and analysis team in Belgium and a development team in Luxembourg. He mentions that this model worked well because he knew the people in Belgium from his previous work experience and had confidence in their approach and way of working. He explains that when working with people you do not know, there can be a fear or uncertainty about the other person's intentions or motivations. Additionally, he found that occasional visits from the analyst and spending a day together in a room helped in brainstorming ideas and resolving complex issues.

Julien shares his experience working on the ETIAS project, where he encountered similar challenges as the ones he faced on the CDS project. In this case, the dispersed teams comprised architects in Greece and Luxembourg who had never met face-to-face. This lack of a shared physical space made it difficult to brainstorm ideas using tools like whiteboards or paper. He also notes that in virtual meetings, only one person can speak at a time, making the conversation less efficient and productive. In contrast, when people are in the same physical space, they can have one-to-one conversations with each other and collaborate more easily.

Overall, Julien emphasises the importance of face-to-face communication, particularly in workshops, where ideas can be shared and discussed more effectively.

Communication

Julien explains that in dispersed teams, communication is critical, and it is necessary to force it through daily stand-ups, synchronous meetings, etc., to ensure that everyone is aware of the progress and the blockers. He mentions that in a collocated team, communication is more natural because people talk throughout the day, and there is no need for formal meetings to exchange information.

Julien also highlights the importance of human connections and trust in remote teams. Without trust, it is difficult to work efficiently, and small misunderstandings can quickly become major issues. He further points out the impact of body language in communication, highlighting that without facial expressions and other non-verbal cues, emails and calls can be easily misinterpreted and perceived as more aggressive. He compares it to situations where people are driving in their cars and may insult others, but they would not do so if they were face-to-face. He notes that there is a detachment in written communication, as in social media, where people may say things, they would not if they knew the person well.

Julien goes on to discuss the importance of being able to read people's moods and emotions in a physical workplace, as this can help to determine when it is a good time to approach someone with questions or concerns. In contrast, in remote work, you cannot gauge someone's emotional state, which can lead to miscommunication or misunderstandings.

Processes

Julien mentions that they implemented some processes to improve communication and coordination. One such process was the introduction of a board of questions, where developers could create a ticket for each question. These tickets were then analysed by the business analysts instead of dealing with them through private messages that could be easily lost. This approach allowed each team member to work without blocking communication and gave them their own time to work on their tasks.

Leadership

Julien believes that having a team leader in remote teams is not the best approach for effective coaching and support. The team leader's role is to follow and coach the team, but remote work can make it difficult to perform these tasks effectively. There is a fear of bothering someone when sending messages or emails, and people often get stuck without reaching out for help. Also, younger or newer team members may be hesitant to ask for assistance. People will only contact their team leader when they are stuck or trust them completely. When the team leader is physically present, they can quickly identify when team members are stuck, such as when they have been looking at the same thing on their screen for hours or during a casual discussion over coffee.

Julien points out that in remote work, there is also the opposite problem of someone calling you constantly while you are trying to work. If that person was physically present in the same space, they would see that you are busy or in a discussion and would not interrupt you every two seconds.

Julien stresses the importance of coaching and learning opportunities that are often missed in remote work environments. Remote reviews and meetings do not provide the same level of guidance and learning as in-person interactions, which can be more effective for showing someone how to do something or work efficiently. Julien believes that the COVID-19 pandemic has limited people's learning opportunities in the past two to three years due to remote work.

Advantages of dispersed team

Julien highlights the benefits of having dispersed teams, including the ability to tap into a wider range of profiles and expertise. This is particularly important when recruiting for roles such as developers, analysts, and managers, which can be challenging to fill in a single location. Julien also notes that working remotely can provide an opportunity for individuals to work independently and reflect without interruption. Additionally, having dispersed teams allows for

different experiences and perspectives, as team members from different locations and cultures can offer unique insights and ideas that might be missed if everyone works in the same way.

Cohesion and relationship

Julien explains that when managing a dispersed team, it is important to promote team cohesion. He mentions that when working on a project with two team members who were physically isolated, they tried to include them in sprints and break down barriers to collaboration. It was not done on the ETIAS project, which he believes was a big mistake that caused tension and inefficiency. He notes that when everyone works on their own, it may seem to work, but it increases the risk. Having a joint view of the situation is crucial to avoid misunderstandings and missed issues. If everyone works in silos, there is a higher risk of missing important information, which can lead to problems with the client. Julien emphasises the importance of including team members in scrum meetings and other collaborative efforts to keep everyone informed and ensure smooth project management.

Julien explains that having a physical presence together is the ideal way to improve team cohesion and relationships. It does not necessarily have to be an organised team-building activity, but simply being together in the same space, whether it is working or having a meal, can improve relationships and ease tensions. However, this is not always feasible depending on the distance between team members. In the case of the ETIAS project, there were issues with the team in Greece, and in order to improve collaboration, they are planning to visit them in person. Julien notes that being in close physical proximity to team members can improve relations and make it more difficult to engage in negative interactions such as criticism or insults. He then shares his experience of meeting some of the Greek team members at the company's end-of-year party and notes that despite his previous negative interactions with them, they were all happy and friendly in person. This contrasted with his negative interactions with them over email. He realised that perhaps all that was needed was for them to meet in person.

Selecting the right dispersed team members

Julien explains that working in a distributed team can pose some challenges related to different personalities. He notes that even in physical teams, there are people who may not get along due to differences in character or temperament. gives examples of team members with different preferences, such as those who prefer complete silence, those who are always joking around, and those who cannot handle negative comments. Overall, Julien suggests that managing interpersonal relationships is crucial in both physical and distributed teams.

He also mentions that there are specific technical skills required for remote work (e.g., ability to better communicate the ideas through tools such as diagrams and drawings, to structure emails or write clear and concise messages). He notes that this is an important aspect of communication and can help to make the message clearer and more easily understood.

Conflict management

Julien discusses how conflicts can arise in distributed teams and how they can be managed. He gives an example of a conflict between two teams that was resolved by reducing interactions and dependencies. However, he also notes that avoiding conflict is not a long-term solution, and that it can lead to further problems down the line. Julien notes that this approach is common among Belgians, who tend to avoid conflict, while the French are more likely to try to resolve conflicts directly. He gives an example of how they dealt with a conflict with a team member by isolating him rather than trying to change him. Julien notes that this approach can be dangerous because it does not actually resolve the underlying issues and can lead to the same conflicts recurring. Ultimately, Julien suggests that it is important to address conflicts directly rather than avoiding them, even if it is uncomfortable or difficult.

Collaboration

Julien discusses the importance of effective collaboration in distributed teams and the need for a bridge between different teams. He explains that communication between teams can be slow and difficult, but it is important to ensure it is good enough to maintain efficiency. He notes that it is not necessary for everyone to be friends with each other, and that the level of collaboration required depends on the working model in place. The focus has been on ensuring that everyone works efficiently, but in their own respective areas. Julien mentions that they have attempted to minimise interactions between teams, primarily for economic reasons, but acknowledges that this approach is only effective if there is trust and competence on both sides. There must be a competent individual on each side who takes ownership and responsibility for the team and is trustworthy and transparent.

Julien also explains that the model of having two separate silos did not work with the Greeks, as the key elements were missing. Therefore, a more collaborative approach needs to be taken instead of just training people, making sure they follow processes, or playing the role of a cop from afar, as this approach is ineffective.

Annex C.4. Timothée – Delivery Manager in Luxembourg

Interview details: Conducted remotely via Microsoft Teams on March 17, 2023.

Profile: With over 10 years of experience in software development, Timothée is an accomplished IT professional who has primarily worked in Luxembourg. He has held various roles within ARHS Developments, including Analyst Programmer, Team Leader, and Delivery Manager.

Throughout his career, Timothée has demonstrated strong leadership skills and a deep understanding of project management. He has led teams of developers and supervised complex software development projects, mainly in the field of customs. He values the commitment of his team members and prioritises their development and growth. Timothée is also skilled in

programming and has hands-on experience developing software applications.

Timothée's proactive approach allows him to continually evaluate and enhance the project's procedures to increase efficiency and optimise outcomes.

Team configuration: Timothée has worked on various projects throughout his career, primarily in a collocated setting. At the beginning of his time at ARHS, he worked as a developer on a relatively simple application project with a small team of approximately 4 people, including individuals from both the Greek and Luxembourgish offices. However, since then, he has not worked on any dispersed teams as a developer.

As a Project Manager, Timothée has had the opportunity to work on two dispersed team projects. The first project was a temporary collaboration with people from the Greek entity on one module of the Import Control System (ICS2). The team was split across two sites, Greece and Luxembourg, and the Luxembourg team was called to help the project process as the Greek team was falling behind.

The second project is an ongoing project involving a larger team of approximately 10 to 15 people. The development and testing team are located in Luxembourg, while the analysis team is in Belgium. During the initial months of the project, the application was built in collaboration with another company, with developers and analysts mainly located in Spain. Additionally, at a certain point in the project, two developers from Brussels contributed to the project.

Dispersion: Based on the previous paragraph and the projects Timothée has worked on, several dimensions of dispersion can be identified. Geographical dispersion is evident with teams located in Luxembourg, Belgium, Greece, and Spain. There is also temporal dispersion with the Greek team, cultural dispersion mainly with people from Greece and Spain, and organisational dispersion with the involvement of another company in one of the projects. In terms of configuration, the sub-team sizes seemed balanced, except for the last project, where the majority of the team was located in Luxembourg, except for the 3 analysts located in Brussels.

Findings: The different topics discussed with Timothée were organised by theme after the conversation.

Integration

Timothée delves into his experiences as a developer and project manager, working with geographically dispersed teams. As a developer, he found collaborating with remote team members relatively simple, attributing this to the smaller, efficient teams. However, managing remote teams presented unique challenges.

He recounts a problematic situation involving two remote developers from Brussels, which he labels a "catastrophe". He suggests that one of the main reasons for this was the difficulty in integrating the remote developers into the team, as well as a lack of motivation on their part.

Timothée acknowledges that there were also personal competency issues with one of the developers but suggests that even if they had been on-site, it would not have made a significant difference to their integration. He explains that they did try to encourage the remote team to form a cohesive group, but they were not successful. He mentions that they never met physically and did not do any team-building activities with them, which could have helped. The remote team's lack of desire to be part of the project further exacerbated the situation.

On the other hand, Timothée highlights a positive collaboration with a business analysis (BA) team based in Brussels. The distinct competence centres for each team – analysis for the group in Brussels and development for Timothée's team – facilitate smooth collaboration. The partnership thrives due to the use of efficient tools like Teams and focus on competence centres. According to Timothée, the effectiveness of their collaboration is also due to their understanding of what needs to be done on each side, which eliminates the need for excessive explanations and saves time.

According to Timothy, collocation is not always necessary, especially when different competence centres are involved. In their current configuration with the BA team, working remotely is not a problem. However, if they were to share the same competence centre, synchronisation problems and misunderstandings could arise. Ultimately, he feels that the success of remote collaboration depends on the skills of the team members.

Process

Timothée talks about how the team had to put processes in place to address questions efficiently. He mentions that this was something they could have done even if the team were collocated. However, the fact that they were distributed forced them to create these procedures. Timothée highlights the importance of the tools that were put in place by the team, as they help centralise communication and ensure everyone is working in a similar way. He notes that without these tools, working on the project could quickly become chaotic, but with them, the team has been able to work efficiently despite being distributed.

Cohesion

Timothée shares his thoughts on team perception and cohesion, noting that while he personally views the team as a unified entity, others may not share this sentiment. For example, he mentions that some team members may feel like there is a barrier between the Luxembourgish and Belgian teams, possibly due to differences in their roles or interactions. He points out that as a project manager, he needs to communicate a lot with the BA team, but a developer may not think to involve them. He also suggests that personality may play a role, with some people feeling hesitant to ask questions or involve others in their work because they do not want to bother or appear foolish. Timothée emphasises the importance of bidirectional communication and encourages everyone to work together to ensure the project progresses smoothly.

To address this, the team tries to organise activities that bring everyone together on neutral

ground (i.e., in an office between the Brussels and Luxembourg offices), so that they can see themselves as part of a common group with shared goals. Timothée stresses the importance of creating a sense of unity and integration among the team members, even if they work remotely or in different locations.

Social relationships

Timothée observes that working with a remote team naturally presents a difference in the social aspect compared to working with collocated colleagues. While he does not feel a barrier between himself and his remote teammates, he acknowledges that there are fewer opportunities to discuss non-work topics, such as hobbies and personal interests, which often occur during coffee or lunch breaks.

He believes that his team is missing out on this aspect of social interaction and suggests that more frequent implementation of solutions is necessary.

Timothée proposes exploring alternative formats to foster social interactions, such as initiating a new activity or format following a sprint planning session. Games or interactive activities could be used as well, with the idea of one team performing an action and sending it to another team for a response. Timothée believes that this approach could promote communication and engagement between teams, even when they are not collaborating on a specific task. Additionally, he believes such activities could spark discussions and messages between teams, ultimately strengthening their overall cohesion.

While Timothée strives to ensure all team members share the same vision, objectives, and values, he currently lacks a specific action plan. A team member proposed publicly displaying project progress to promote responsibility and accountability, which Timothée believes could help realign the team with project objectives and foster a sense of responsibility among members.

Leadership and personality

Timothée notes that some individuals possess a natural ability to unite others and foster a sense of belonging within a team. However, he does not consider this a leadership skill, but rather an innate trait. He does not elaborate on other leadership qualities that might be more relevant for distributed teams.

He believes that anyone with the willingness to work in a distributed team can succeed in doing so. However, those resistant to the idea might face difficulties adjusting to the change in work approach. In this context, being agile and adaptable is crucial. Timothée has not observed any opposition to remote work or collaboration with geographically dispersed colleagues within his team.

Culture

Timothée reflects on the challenges he has encountered working with colleagues from diverse cultural backgrounds. He believes that cultural differences can hinder integration into the work environment and that some colleagues may struggle to adapt to the distinct working culture in Luxembourg. He observes that colleagues from other cultures may exhibit varying levels of autonomy or vision compared to their Luxembourg counterparts, which could affect collaboration. However, Timothée recognises that his views might be influenced by cultural biases and stereotypes.

He also highlights differences in work culture, suggesting that colleagues from other cultures might have a more relaxed attitude, while those from Luxembourg focus on meeting objectives and fulfilling responsibilities. Initially, Timothée aimed to change his colleagues' work habits to align with the team's methods but realised this approach was ineffective due to inherent cultural differences. Although it is challenging to convey the team's way of working, they continue to clarify expectations.

Timothée acknowledges potential generational conflicts in the workplace, with younger workers having distinct expectations and work styles compared to older ones. He accepts that his team may need to adapt to these differences rather than attempting to change their colleagues' behaviour.

Annex C.5. Melvin – Senior Developer in Luxembourg

Interview details: Conducted remotely via Microsoft Teams on March 21, 2023.

Profile: With over five and a half years of experience at ARHS Developments (Luxembourg), Melvin has established himself as a skilled software developer with comprehensive knowledge across a range of IT-related fields. Throughout his career, he has progressed from a Programmer to his current position as a Senior Analyst Programmer.

As a Senior Analyst Programmer, Melvin showcases his extensive technical expertise and experience in the IT industry. He is a trusted mentor for fellow developers on his team, who often rely on his mentorship and counsel to tackle complex challenges.

Melvin firmly believes that effective teamwork and communication are essential for the success of any project. He places great importance on building positive and trusting relationships between team members and strives to create a collaborative and supportive work environment.

Team configuration: Melvin has been involved in various projects since joining ARHS, with most of these having a collocated team setup where the entire team is based in the same office. He mentioned two specific projects where he worked as part of dispersed teams, serving as a software developer with strong expertise, acting as a reference point for others. These projects are also referenced in Timothée's interview, which can be found in the previous section.

The first project, STI-STP, is a customs-related application. Melvin collaborated with team members from different companies and locations. Three to four developers were based in

Greece and worked for the same company as Melvin, albeit a different entity. Over six individuals, including developers and business analysts, were based in Spain and were part of an entirely separate company. Lastly, Melvin worked with two colleagues in Luxembourg from the same company. Melvin and his Luxembourg-based teammates joined the Greek and Spanish teams temporarily to assist with their challenging schedule.

In addition to STI-STP, Melvin has been working on the ongoing SSA project, which has a team size of approximately 10 to 15 people. The development and testing teams are in Luxembourg, while the analysis team operates from Belgium. During the project's initial months, the application was developed in collaboration with another company, primarily consisting of developers and analysts based in Spain. At one point, two developers from Brussels also contributed to the project.

Dispersion: Melvin's experience with the STI-STP and SSA projects exposed him to various types of dispersion. He encountered geographical dispersion as he collaborated with team members from different locations, including Greece, Spain, Belgium, and Luxembourg. Temporal dispersion was also present, with a one-hour time difference between Luxembourg and Greece.

Organisational dispersion was another factor, as Melvin worked with individuals from different companies and entities, navigating across distinct organisational boundaries. It is likely that cultural dispersion played a role within the group as well, given the diverse nationalities of Melvin's team members representing various cultural backgrounds. Lastly, configuration dispersion was evident in the projects Melvin participated in, as his teams were spread across multiple sites with geographically defined subgroups.

Findings: After the conversation with Melvin, the different topics discussed were organised by theme into two parts: the first part focuses on Melvin's experience on the STI-STP project, while the second part details his experience with another project called SSA.

Overview of the history of the project and Melvin's role in it

Melvin recounts his experience working on the STI-STP project as part of a distributed team for six months, brought in to help with tight deadlines. The project had been in progress for about two years, with another company starting it before the ARHS Greeks entity joined to eventually take over. However, after more than a year, the Greek team had made little progress, prompting the request for Melvin's team to provide support. As the technical expert, he shared insights from his previous project experiences and observed numerous mistakes being made. The complexity of the project was exacerbated by the involvement of teams from various countries and companies, creating synchronisation challenges.

Communication with the various sub-teams

He identified a lack of genuine communication between the different teams, with daily stand-

up meetings serving more as formalities than opportunities for collaboration. Additionally, he observed that some team members did not share critical information, which negatively impacted the work. He speculated that these issues might have resulted from remote work or the reluctance of some team members from different companies to share information.

Even collaborating with the Greek team, which belonged to the same company as Melvin's team but a different entity, proved to be difficult. He suspected that their preoccupation with their own tasks hindered effective communication and meeting coordination. Consequently, Melvin's team felt isolated and had to independently source the information required to complete their work.

Although they initially had a designated contact person within the Greek team, Melvin's team soon realised this was insufficient. As a result, they took it upon themselves to seek the necessary information and resources to move forward in the project.

He notes that having the business analysts on the other company's side caused problems in contacting them and getting timely responses. When Melvin sent a message to the business analyst, he often received a response three days later, which was too late when they were already in a rush.

Lack of leadership

Melvin points out that there was no designated team leader actively working to unite the various teams. Although there was an individual from another company with more expertise who served as the primary point of contact, it was mainly the team members themselves who took the initiative to learn and exchange information. No one was actively fostering teamwork or facilitating communication between the teams.

Additionally, Melvin observed a lack of leadership from the Greek team, which was expected to eventually assume full responsibility for the project. While Melvin's team was initially assigned to provide support, the Greek team seemed hesitant to take charge, possibly due to a perceived lack of expertise with the application.

Structure and processes

Melvin explains that they took the lead in proposing ideas to improve the way of working during the meetings. They tried to put processes in place to avoid problems such as integration issues and conflicts when someone made a modification in the global repository. They were trying to have integration tests and technical processes that would ensure that when someone merged a change, it would not negatively impact other teams. However, it took a lot of time to establish these processes, and it was difficult to get everyone on board. At first, it was not easy to implement these processes, but eventually, they were able to make it work, which was a good thing. Melvin suggests that they had some impact, but he is unsure if they are still following the same processes.

Melvin says that they had very little leeway to improve communication processes because they were supposed to be a temporary team that was just there to help. He also mentions that when they proposed ideas, it felt like they could be dismissed because they were in a rush and did not have time for them.

Melvin believes that meeting team members in person would not have significantly impacted their ability to work together, arguing that clear processes and knowledgeable individuals were more crucial for effective collaboration. He identifies the main issue as a lack of structure and planning, with the team operating reactively instead of following a clear project plan.

Melvin explains that they stopped working on the project because it was only temporary and they had completed their task. He also says that they had no control over the management aspect of the project and that they could only give technical suggestions, so they decided to switch to another project where they could have more control and input.

Communication with the analysis team

In his second remote team experience on the SSA project, Melvin notes that the majority of the team was based in Luxembourg, while the analysis team was located in Brussels. He assumed a similar role to the one he had on the STI-STP project. He explains that remote work with the business analysts (BAs) has been effective and has not caused any problems. The project has now a well-defined structure, clear roles, and standardised communication, allowing for better collaboration. Team members can directly contact BAs when needed or post questions on a dedicated board, providing a balance between flexibility and structure.

Melvin highlights the successful collaboration with the BAs in Brussels, as their diverse skills and expertise allowed for simultaneous progress in both business and technical aspects. He acknowledges the initial challenges due to the lack of knowledge, but as the team members gained experience and familiarity with each other, communication improved and became more efficient. Melvin emphasises the importance of experience and familiarity in shaping effective communication, as they enable better understanding of the right questions to ask and the most suitable communication methods.

Melvin reflects on the possibility of misunderstandings and information loss within the team due to the remote location of the BAs. While he acknowledges that it is not a frequent occurrence, he believes that it is still a possibility. To mitigate this, he suggests a more global approach to communication, where important changes and information are shared with everyone in the team, rather than just with one person who may not be able to pass it on effectively. By doing this, he believes that it reduces the chances of information being missed or not reaching the relevant people. Melvin cites a recent instance of a colleague’s frustration due to a lack of communication, highlighting the significance of inclusive communication in the team.

Melvin believes that maintaining everyone informed is crucial, particularly on work-related

issues, to prevent disengagement, lack of motivation, and potential problems. While he recognises that everyone has their own perspective on how communication and relationships should work in a remote team, he stresses the importance of keeping everyone in the loop to ensure better engagement and understanding.

Competence center divided across multiple locations

At the beginning, there were also two developers working from Belgium on the project, but it did not work out either. Melvin attributes this partially to the remote aspect of the project, which made it challenging for the Belgian team to feel like they were part of the team. With no face-to-face meetings, it was difficult for them to integrate into the team. Melvin suggests that meeting in person at the beginning or after a few weeks could have helped them feel more included. He also notes that it was difficult for him to assess whether the Belgian team understood everything since he did not have the non-verbal cues that he would have had in person.

Melvin observed that while the sprint planning and meetings were effective in integrating the Belgian developers and providing structure to the project, he still felt that something was missing – human contact. Since they were all developers, he needed to be in close contact with them. However, due to the remote setting, it was difficult for his colleagues to understand why he might not be immediately available, and the lack of personal connection and presence made it harder to work together effectively. Melvin highlights that in an in-person setting, he would have been able to physically see a colleague struggling and provide immediate assistance.

Melvin shares that when working remotely with someone who had technical issues, he found it helpful to share his screen and take control of the other person's computer, if possible, to demonstrate what they needed to do. This approach was more interactive than just providing verbal instructions. However, Melvin also notes that it could be challenging to track the progress of someone's work if they did not provide regular updates, as he could not check in with them every few minutes. He had to rely on them to keep him informed of how things were progressing.

Melvin is discussing whether having a team with unique skills, such as developers, split across different locations is doomed to fail or if it can work under certain conditions. He explains that it can work, as he had experienced it during the COVID pandemic when their team was dispersed, but it worked because everyone had the necessary skills and experience, and they knew each other well. However, when you join a project, what is lacking is experience, both technical and interpersonal. When you meet someone remotely for the first time, it becomes complicated to explain things to them, and you have to learn their work style, anticipate their reactions, and build trust. Melvin suggests that physical meetings and more calls can be helpful in such situations to learn how the team members work and get to know them better. Overall, Melvin believes that it can work with a period of transition where there are more contacts and

interactions at the beginning.

Social connections

Melvin places a strong emphasis on the importance of building relationships and fostering social connections within a remote team. He believes that meeting in person can be particularly helpful in facilitating interactions and strengthening bonds between team members, drawing upon his own experience of meeting with colleagues in Namur. He also notes the value of non-work-related conversations, mentioning how he used to chat with one of his colleagues about personal topics. While he considers physical team bonding activities to be optimal, Melvin suggests that remote alternatives can be effective as well.

He believes that when team members know and trust each other, they can ask questions and communicate more effectively, which can ultimately improve the quality of their work. He highlights that initially, there may be hesitation to reach out to colleagues who are physically distant, but as time goes by, familiarity increases, and communication becomes easier. Moreover, Melvin believes that getting to know colleagues on a personal level humanises them and makes their roles appear more than just a function, thereby creating a sense of belonging and purpose within the team.

Melvin suggests that team bonding activities should not be a one-time event and should be done regularly to strengthen the team's relationships. He enjoyed meeting with his team members in person and would like to do it again.

Selection of dispersed team members

Melvin is discussing the selection of team members in a dispersed team. He believes that not everyone is suited to work in such a team. He identifies several traits that may not be suitable for remote work, such as a lack of involvement in their work, imposing opinions without concern for others, not taking responsibility for their work, and not participating in team discussions or activities. These traits can create conflicts and toxic relationships that are difficult to manage remotely and can negatively affect the team's performance. Melvin suggests that with regular informal contacts, it is possible to make such people feel involved and part of the team.

Melvin places a lot of emphasis on building relationships and improving social interactions within his team, as he believes it helps him work better when he gets along with the people he works with. However, he acknowledges that different people have different personalities and preferences, and for some, working remotely without the pressure of social interactions can be beneficial. Therefore, it is important to consider individual differences and preferences when selecting team members for a dispersed team. Ultimately, it depends on the individual's personality and what works best for them.

Annex C.6. Elena – Analyst in Belgium

Interview details: Conducted in-person in Brussels on March 23, 2023.

Profile: Elena, originally from Italy, moved to Belgium a few years ago to pursue her studies. After completing her education, she joined ARHS as a business/functional analyst. This is her first job in the IT sector and she has been with the company for almost two years. For a bit more than a year, she has been part of a dispersed team, marking her first experience in such a setup, excluding her time during the COVID-19 pandemic where she had to work and communicate remotely with her university peers.

Currently, Elena works with other analysts based in Brussels, while the rest of her team, including developers and testers, is located in Luxembourg. She values human interactions and rapport with her colleagues. She actively engages in informal conversations and personal questions to build closer connections with her teammates.

As a conscientious and committed professional, Elena ensures that her work is done well and is extremely dedicated to her project. She continuously learns and adapts to her new working environment.

Team configuration: Elena is currently working with Timothée and Melvin, whose interview is available in the previous sections.

She works closely with other analysts based in the same Brussels office, resulting in frequent interactions with them. The rest of the team, comprising approximately 10 to 12 members, is located in Luxembourg and consists of developers, testers, and managers.

During the project's initial months, the application was developed in collaboration with another company, primarily involving developers and analysts based in Spain.

Dispersion: Elena faces multiple dispersion dimensions in her work environment. Geographically, her team is divided between Brussels and Luxembourg, creating distance-related challenges. Organisationally, the collaboration with another company in Spain adds complexity to the team dynamics. From a configurational perspective, the majority of the team is based in Luxembourg, resulting in an unbalanced distribution. However, temporal dispersion is not a significant issue since team members are situated within similar time zones.

Findings: The different topics discussed with Elena were organised by theme after the conversation.

Communication and learning

Elena discusses the challenges she faces while working in a dispersed team. She highlights the difficulties she encounters in communication, especially when interacting through messages. Elena expresses a preference for face-to-face communication, as she finds it hard to understand her colleagues' intentions and emotions otherwise. Though video calls can alleviate this issue

to some extent, they still do not fully replace the experience of in-person interaction.

She thinks that misunderstandings are more likely to occur between remote teams, as they might not capture all the necessary information. Elena finds it much easier to communicate and clarify things when she can do so in person.

Furthermore, Elena mentions her personal learning style, explaining that she finds it easier to learn when someone is physically present to provide immediate feedback and guidance. This was also a challenge for her during the COVID-19 pandemic. Being in close proximity to her colleagues motivates her more, as she feels her work becomes more meaningful and real. In-person interaction allows her to communicate not only through words but also with gestures.

Perceived proximity

Elena reflects on her relationships with her remote colleagues, stating that she is able to work well with her colleagues in Luxembourg. However, she acknowledges that distance can limit the depth of their relationships, as it is difficult to develop stronger social bonds without face-to-face interactions.

She says that her relationships with her colleagues in Brussels are stronger than those with her colleagues in Luxembourg because of the physical distance. Elena feels that it is difficult to achieve the same level of closeness with colleagues who are far away.

She also talks about the importance of social interaction and team cohesion, saying that face-to-face micro-interactions are crucial to create strong bonds within the team. Although virtual team-building activities can be fun, Elena feels that they cannot replace the importance of physical presence.

She says that she prefers her whole team to be in Brussels. Elena values interaction and believes that remote communication is not as effective as face-to-face communication in fostering strong relationships and effective collaboration.

Elena talks about the impact of feeling less close to her colleagues in Luxembourg than to those who are physically present. She feels that, although this does not directly affect her effectiveness at work, it can have an impact on her overall job satisfaction. She would be quicker to resign if she only worked with remote people, as she would not feel connected to them.

Elena recognises that sending informal messages and asking personal questions can help to create stronger bonds with remote colleagues, citing as an example a developer who has started to contact her more frequently. She mentions that she wants to get to know her colleagues better, so that when they meet in person they are not starting from scratch.

Team cohesion

Regarding her perception of the entire team, Elena finds it difficult to see the Luxembourg and

Brussels teams as one unified group. When she thinks about her team, she primarily considers the colleagues she sees in Brussels. Even though she may not be working on the same projects as her Brussels colleagues, Elena takes the time to discuss their projects and stay informed, as she feels more connected to them.

Elena admits to feeling somewhat excluded from the Luxembourg team, attributing it to the distance. She would prefer to see them more often and believes that visiting them in person would be beneficial.

Trust

When asked about trust, Elena does not feel any particular lack of trust towards the distant colleagues even if she does not know them well. Her trust grows as she takes the time to get to know them and interact with them.

Elena acknowledges that the quality of work also plays a role in trust. She gives an example of a colleague whose work was not up to par, which affected her trust in him. She thinks that it is essential for team members to admit when they do not know something, rather than pretending to have the answers.

Selecting the right dispersed team members

When asked if there are people who may not be suitable for working in a dispersed team, Elena suggests that it depends on the person. She believes it is more about personal preference, with some people preferring regular in-person interactions, while others might work more independently.

For Elena, the human connection is crucial in the workplace. She values her relationships with her colleagues, and if she had started with the entire team in Luxembourg, it would have been challenging for her. She does not see many advantages in dispersed teams, other than the logistical benefits.

Annex C.7. Stergiani – Developer in Greece

Interview details: Conducted remotely via Microsoft Teams on March 24, 2023.

Profile: Stergiani is a software developer with extensive experience in collaborating with dispersed teams. For the past year and a half, she has been with ARHS Developments Hellas, working alongside team members in various locations. Before joining ARHS, Stergiani worked as a software engineer for two years.

Throughout her career, Stergiani has demonstrated adaptability and resilience, managing to acquire the skills necessary for her work, even when faced with the challenges of remote working environments. She values effective communication and collaboration and is comfortable having predominantly professional relationships with her colleagues.

Team configuration: Stergiani’s team comprises around twelve developers split between

Greece and Belgium. Management and analysis centres are based in Belgium, while the development team is dispersed across both countries. In Greece, the team members are not concentrated in a single city; all Greek developers, except for Stergiani, are located in Athens, while she is based in Thessaloniki.

Dispersion: Stergiani faces several dispersion dimensions in her work environment. Geographically, her team members are dispersed across different cities within Greece, such as Athens and Thessaloniki, and even extend to another country, Belgium, resulting in a lack of physical proximity. Consequently, there is also a temporal dispersion, as Belgium and Greece are not in the same time zone (1 hour difference).

In terms of configuration, the distribution of team members across multiple sites in Greece and Belgium, coupled with Stergiani being the sole team member in Thessaloniki, underscores potential isolation and imbalances among geographically defined subgroups.

Findings: The different topics discussed with Stergiani were organised by theme after the conversation.

Communication

Stergiani has been working with dispersed teams throughout her career, beginning with a project that involved team members in Cyprus. Both that project and her current work at ARHS involve collaborating across separate entities within the same company. While Stergiani has grown accustomed to working remotely, she acknowledges the benefits of in-person communication and team bonding.

She briefly worked in an office setting before the COVID-19 pandemic but has since worked from home for three years. Having joined ARHS in 2021, Stergiani is based in Thessaloniki, while her teammates are located in Athens. Despite this geographic separation, she maintains a strong connection with her colleagues through effective communication and mutual support.

Stergiani's experience working with the Cyprus-based team was more challenging due to the language barrier, as they spoke a different Greek dialect that she found difficult to understand. This made her feel excluded. Currently, she is satisfied with her dispersed team setup but would consider going to the office more often if there were team members in Thessaloniki.

Stergiani has had a positive experience working as a developer in dispersed teams, as she can rely on tools like Microsoft Teams for assistance and has felt supported from the beginning. Her proactive personality helps her navigate challenges, while she also appreciates the role of team management in facilitating communication. Stergiani believes that neither personality nor lack of skills should prevent someone from thriving in a dispersed team, as she has not observed any communication problems among her colleagues.

She notes that written communication through chat can be different than verbal communication, and sometimes the way things are written can create misunderstandings. When there are

misunderstandings, Stergiani prefers to make a call with screen sharing in parallel to clarify the topic. On the topic of not using the cameras during calls due to internet connection problems, Stergiani says that she personally does not like using the camera, but has not observed any problems with not being able to see a person's face affecting communication.

Social connection

Stergiani maintains a primarily professional relationship with her remote team members, while still being friendly during work hours. She does not feel the need to extend these relationships beyond work but is open to socialising outside the office if the opportunity presents itself. She states that this setup seems normal to her and is the way she has learned to work.

Stergiani is acknowledging the potential issue of missing out on socialising with colleagues during work when working remotely. However, she also notes that socialising can still happen in their current setup through small talk before calls and discussions with colleagues. She mentions that she is not always in the mood for small talk but tries to engage in it most of the time.

Stergiani enjoyed participating in a virtual event where her team played "Among Us", finding it a valuable opportunity for bonding and socialising with her co-workers. She believes such events enhance team cohesion and would appreciate their regular occurrence.

Team leader

Stergiani emphasises the importance of soft skills for team leaders in dispersed teams, particularly in fostering effective communication among members. She suggests that having separate team leaders in different locations may be more beneficial for organisational purposes rather than directly impacting the team's performance.

Learning

When Stergiani began her career as a developer, she faced a learning curve and required guidance to complete her tasks. Lacking prior experience in web development, she needed substantial support to adjust to her new work environment. Despite these challenges, she was able to learn the necessary skills to perform her job effectively.

Abstract: This study explores the feasibility and conditions under which dispersed teams can effectively collaborate and find enjoyment in their work within the IT sector, particularly in the context of project-based team structures. The research is based on a literature review and an empirical study conducted at ARHS Developments, a company specialising in the development of complex web applications. Crucial factors contributing to the success of dispersed teams encompass trust, communication, leadership, technology, and process. The empirical investigation reveals two main team configurations: the siloed approach and the integrated approach, each presenting their own merits and drawbacks. The findings emphasise the significance of trust, communication, leadership, technology, and individual differences in establishing successful dispersed teams. The study also underscores the ongoing relevance of geographical distance and the necessity for further enhancement in socialisation and coaching/learning aspects.

A “cookbook” has been developed, offering managers with 33 practical tips to foster efficient and enjoyable environments for dispersed teams. The findings bear important implications for the IT industry and beyond, delivering insights on how to optimise team performance and satisfaction in a geographically dispersed setting.

Résumé : Cette étude examine la faisabilité et les conditions permettant à des équipes dispersées de collaborer efficacement et avec plaisir dans le secteur des TIC, notamment dans le contexte des structures d’équipes basées sur des projets. S’appuyant sur une revue de littérature et une étude empirique chez ARHS Developments, elle identifie la confiance, la communication, le leadership, la technologie et les processus comme facteurs clés de succès. L’étude révèle deux configurations d’équipe principales, l’approche en silo et l’approche intégrée, avec leurs avantages et inconvénients respectifs. La distance reste importante et nécessite des améliorations en socialisation et apprentissage/encadrement.

Un manuel proposant 33 conseils pratiques pour des environnements performants et agréables aux équipes dispersées a été créé. Ces résultats impactent le secteur des TI et au-delà, aidant à optimiser performance et satisfaction dans des contextes géographiquement dispersés.

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