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Decision Factors for Remote Work Adoption: A Critical Analysis

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October, 2020

TECNOLOGIAS
E ARQUITETURA

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Agradecimentos

A realização da presente dissertação de mestrado não seria possível sem o apoio de diversas pessoas, sendo os agradecimentos um ato de reflexão final em que espero não deixar ninguém sem um obrigado.

Em primeiro lugar, agradecer ao meu orientador Professor Doutor Rúben Filipe de Sousa Pereira, que foi incansável, compreensivo, disponível e uma excelente pessoa ao longo de todo o percurso deste trabalho. Sem ele esta experiência não poderia ter sido tão enriquecedora e agradável. Um sincero muito obrigado, graças à sua orientação sinto que cresci academicamente, profissionalmente e intelectualmente. É com enorme orgulho que digo que foi um prazer trabalhar consigo, um professor em todos os sentidos.

Em segundo lugar, quero dar um enorme agradecimento à minha Família, porque sem eles nada disto era possível. Muito Obrigado pelo amor, carinho, motivação, apoio e educação ao longo de toda a minha vida.

Em terceiro lugar, gostaria de deixar uma palavra de gratidão aos meus amigos por todas as conversas e momentos. Quer de reflexão, descontração, trabalho, brincadeira, tudo. Essencialmente por estarem sempre presentes e pela ajuda que antes de ser pedida era oferecida.

Por fim, estou profundamente grato a todas as pessoas que participaram nas entrevistas, desde os amigos, colegas de trabalho e todos os conhecidos de pessoas em comum que se mostraram disponíveis para ajudar e falar comigo. Tornaram esta experiência muito interessante, enriquecedora e divertida. Adorei e aprendi muito com as nossas conversas, um sincero obrigado por disponibilizarem o vosso tempo e principalmente a boa disposição e disponibilidade.

Resumo

A adoção do Trabalho Remoto está a aumentar entre as organizações. Por razões económicas, vantagem competitiva ou mesmo como parte do plano de continuidade de negócios, o Trabalho Remoto é um domínio que vale a pena investigar mais a fundo. No entanto, a literatura carece de mais conhecimentos e consenso relativamente aos fatores de decisão que as organizações podem considerar antes e durante a adoção do Trabalho Remoto.

Foi realizada uma revisão sistemática da Literatura minuciosa e rigorosa para obter os principais fatores de decisão que influenciam a adoção do Trabalho Remoto e a sua implementação. Além disso, é apresentada uma conceptualização do domínio do Trabalho Remoto, e os principais fatores de decisão foram investigados. Também é apresentada uma lista para cada facto de decisão, bem como a forma como se relacionam entre eles, e é realizada uma análise crítica.

Dezenas de fatores foram identificados e relacionados. Estes provaram ser extremamente importantes a considerar antes de qualquer adoção do Trabalho Remoto. Esta investigação é uma ferramenta estratégica para organizações dispostas a implementar o Trabalho Remoto e uma base para futuros desenvolvimentos académicos no campo do trabalho. Na medida da sua complexidade, as investigações de outros campos (gestão de equipas, governação, gestão de processos empresariais, entre outros) são incentivadas, pelo que podem ser fornecidos contributos valiosos e como tal ajudar a complementar o campo.

Palavras-chave: Trabalho Remoto, fatores de decisão, desafios, vantagens, desvantagens, forças motrizes

Abstract

Remote Work adoption is increasing among organizations. For economic reasons, competitive advantage or even as part of the business continuity plan, Remote Work is a domain worth of further investigation. However, the literature lacks further insights and consensus regarding the decision factors that organizations may consider before and during Remote Work adoption.

Design Science Research Methodology was adopted. A thorough and rigorous Systematic Literature Review was performed to elicit the main decision factors (Advantages, Disadvantages, Challenges and Driving Forces) and their relation that influence the Remote Work adoption and its implementation. Plus, a conceptualization of Remote Work domain is presented, and the main decision factors were investigated. A list for each decision factor as well as how they relate among them is also presented and a critical analysis performed.

Dozens of factors were identified and related. Those were proven to be extremely important to consider before any Remote Work adoption. This research is a strategic tool for organizations willing to implement Remote Work and a base for further academic developments in the field. In the extent of its complexity, researches from other fields (team management, governance, business process management, among others) are incentivized so valuable inputs may be provided and complement the field.

Keywords: Remote Work, decision factors, challenges, advantages, disadvantages, driving forces

Index

Table Index

Figure Index

Abbreviations

RW – Remote Work

DSRM – Design Science Research Methodology

ICT – Information and Communication Technologies

RQ – Research Questions

SLR – Systematic Literature Review

CHAPTER 1

Introduction

Organizations are in continuous evolution [1] and hire people in mass every day and everywhere in a constant search for the best workforce for the necessary jobs [2]. Due to globalization [3], [4], distributed work and distributed teams are unavoidable [5]. The literature points that, due to higher rates of employment compared to that of decruitment [6], big organizations struggle to allocate all their employees in physical spaces [7].

Previous research on the formal and applied sciences fields of knowledge points to the possibility of having to downsize and cut costs to be able to increase flexibility and create customer-oriented solutions [8] in order to stay ahead of the competition. In the meantime, other researches highlighted the proposition of reducing costs for increasing economical outcomes, so the company keeps a positive economic balance [9], or just plain and simple challenges of finding financial saving solutions [10]. To sum up, with globalization, organizations growth brings financial and logistic challenges, such as keeping a positive financial balance and not having enough seats for employees in the physical office space. Due to fierce market competition, organizations search for multiple expertise and competences in their employees and the Remote Work (RW) allows them to be geographically free [11].

In order to fight these challenges and become more competitive, organizations strive to find new ways to become more flexible [12], more rentable [4], [13], more productive [12], [14], [15] and more profitable financially [16], [17]. Technology has been pointed as a pivotal enabler [18] to support massive virtual collaborations [19] that have demonstrated potential for advancing science and to turn the drawbacks of virtuality into strategic advantages while also supporting rigorous scientific outcomes [20].

Therefore, organizations have begun to search for new paradigms and solutions such as RW [21]. RW is not a new paradigm. In the past people made products and farming in-house while selling them at some type of home shop. Then came the industrial revolution and the creation of factories, people started to commute there to be able to produce what they were asked for [22]. Afterwards, driving forces such as globalization [5], the informatization of industries [18], or Governments legislative support [23] have stimulated organizations to start implement RW.

The last decades demonstrated that RW is shaping organizations daily work [24] and contributing in defining the modern workplace [24]. Something that is aligned with the predictions from Gartner and McKinsey & Company [24].

As stated above, and reinforced by some authors [25], [26] RW is a complex domain, in exponential evolution, and literature still lacks studies to understand certain key aspects.

This investigation aims to explore and shed light on the following key aspects: decision factors; advantages; driving forces; challenges; and disadvantages. These were chosen since they are critical even before the RW adoption. Therefore, this investigation has the following research questions (RQ):

RQ1: What are the RW Decision Factors?

RQ1.1: Which are the main advantages of RW adoption?

RQ1.2: Which are the main disadvantages of RW adoption?

RQ1.3: Which are the main driving forces of RW adoption?

RQ1.4: Which are the main challenges of RW adoption?

RQ2: How do the RW Decision Factors influence each other?

The research methodology chosen to follow with the investigation is the Design Science Research Methodology (DSRM), coupled with a Systematic Literature Review (SLR) to elicit the artefact and individual semi-structured interviews to evaluate and tune the artefact. Given the amount of literature on the topic and the lack of consensus regarding some related concepts, the SLR is a proper methodology to start the investigation [27].

After this introductory chapter, the remainder of this dissertation is organized as follows: the second chapter approaches the state of the art. It introduces the theoretical background concerning RW and the Industry, as well as the related work already done. In the third chapter, the author presents the Research Methodology that was used on this study. The fourth chapter presents the design and development of this study, and consists of the planning, conduction and reporting of the review, which is presented in two main subjects: the RW decision factors and their mutual influence on each other. In the fifth chapter, the research synthesis is conducted, where the data obtained from interviews is

presented. Finally, the sixth chapter is reserved for our conclusions, possible future work and the limitations identified during the course of this dissertation.

CHAPTER 2

Theoretical Background

Several denominations can be found in literature to refer to RW. Some authors refer to: flexible work [1], mobile remote workers [14], digital nomads [7], "offroaders " nomadic workers [28], distributed work [29], collaborative work [30], virtual organizations [31], virtual independence [8], virtual worlds [21] and global work, collaborative work and virtual work [30].

From the list of concepts mentioned above virtual work is the one with the most representation in the literature, which reveals that for some authors virtual work is a concept where workers are physically separated at full time or temporally from their office [32], [33] and take advantage of technologies for communication [30]. For others it refers only to the use of electronics to establish communication between employees [1] and to accomplish assignments and improve relationships [34]. Lastly a few authors mention virtual work as the work produced by virtual teams [35] or the work made with the use of platforms for virtual collaboration [36]. This shows a parallelism between remote and virtual work definitions in the literature, which will be explored in this document [10].

RW is under the umbrella of four main different scientific areas, Information Technologies, Psychology, Human Resources, and Logistics. RW affects all of these areas, because you cannot work remotely without information technologies; working remotely might have a positive or negative impact on the individual and their colleagues mental state [37]; someone from Human Resources will most likely have to make a report because the employee is not physically present at the office and, finally, tools are needed for RW outside of the employee local office, which ought to be provided by the logistic department of their organization [21], [38], [39].

For the authors [40] a few years ago the collaboration provided by technologies was lacking, which means that not all of it could or should be supported by computers, and thus technologies were still unable to clearly support group work.

Nowadays technology is a clear driving force for returning to the paradigm of home-office work. It is defended in the literature [41] that technological changes, particularly the developments in mobile and wireless Information and Communication Technologies (ICT), create possibilities to again work in any place and any time. These authors even

go further and tell us that ICT like email, integrated development environments and group decision support tools, can enhance performance.

Overall, several definitions exist for the RW concept in the literature. However, as mentioned before in this chapter, they all have one point in common: geographic distribution. This means that, for a worker to be considered as remote, he needs to be allocated somewhere other than the main office.

Literature argues that virtual and RW can sometimes be the target of confusion by the readers [37]. This means that these two topics are related but not in a strict way [33].

Virtual work can be considered as a part of RW [1] since it is done outside of the main office. Yet in the literature, it is normally associated with work, which is related to the main office but is performed by another team or another person in a geographic different office, whether it is in the same or in different countries.

Another example authors present for virtual work is that it can also be work done in a virtual ambient [21], custom virtual worlds designed and created for specific organizations, where all types of actions can be carried out, from development to communication, to accountability and even just social interaction between employees.

Many authors define virtual work as work environments where workers are either physically separated and/or temporally separated from their peers or the office place some or all of the time, and perform interdependent work activities [32], [33]. Some authors make the distinction between these and the worker not having personal contact at all with other colleagues [2], [34], while others consider virtual work only the collaborative work that happens between employees across the globe using technology mediated communications [1], [30] and build relationships [11], [34].

To sum up, RW is considered as the main and most common definition of the practice working out of the physical office and using technology to effectively work. While virtual work is considered as a type of RW more specific to virtual teams distributed across the globe and people who work more time out of the office [32].

Overall, authors appear to reach consensus on the topics. Therefore, given the context of this research, RW is the concept that will be adopted and then considered as the main subject of the study. Since this research does not intend to provide a consensus on the RW definition, the most adopted definition in the literature is followed. Most authors [1], [2], [14], [24], [30], [42] define RW as a concept where employees who are geographically

dispersed and rely primarily on some type of technology mediated communication to get in touch with their co-workers.

The above definition is the one adopted in this research. While several definitions exist [43], they all have two points in common: geographic distribution, and the use of technologies. This means that, for a worker to be considered as remote, he needs to be allocated somewhere other than the main office he is assigned to and utilize technology [11].

CHAPTER 3

Research Methodology

3.1 Design Science Research Methodology

For the development of the proposed list of RW concepts, it was applied the Design Science Research Methodology (DSRM) presented by Gengler [44] and the seven guidelines for DSRM proposed by Hevner, March, Park, & Ram (2004). DSRM approach was selected since this research aims at solving practical problems by creating and evaluating IT artifacts intended to solve identified organizational problems [45].

IT artifacts are broadly defined as constructs (i.e., vocabulary and symbols), models (i.e., abstractions and representations), methods (i.e., algorithms and practices), and instantiations (i.e., implemented and prototype systems) [45]. It can be assumed that the development of a List of RW concepts extending the knowledge base, falls within the application area for the guidelines by [45] and accordingly, DSRM.

According to Peffers et al. (2006), the DSRM consists of six activities (i.e. steps). Figure 1 presents the applied techniques and activities in each DSRM step. In order to provide rigorous and relevant research results, the author draws upon the following DSRM steps, structuring the paper according to:

- **Problem identification and motivation:** In the first chapter, the problem was specified, practical relevance provided, and the value of a solution justified. Additionally, based on problem scope, research questions were derived guiding this research.
- **Define the objectives for a solution:** The second chapter provides objectives for the intended list of RW concepts. Based on a literature review, design recommendations in RW concepts and assessment will be identified and suggestions for confirmation will be proposed.
- **Design and Development:** This activity is carried out in Chapter 5 and describes the List development. Based on the literature review, the List will be designed and iteratively developed according to the requirements of the interviews performed.

- **Demonstration:** By means of qualitative semi-structured interviews with 109 active workers as participants, the applicability and usability of the artifact shall be demonstrated.
- **Evaluation:** According to Hevner et al. (2004), the artifact will be evaluated in terms of quality, utility and efficacy which cannot be demonstrated fully in this research.
- **Communication**: Communicate the problem, the importance, the utility, the rigor and the effectiveness of its design.

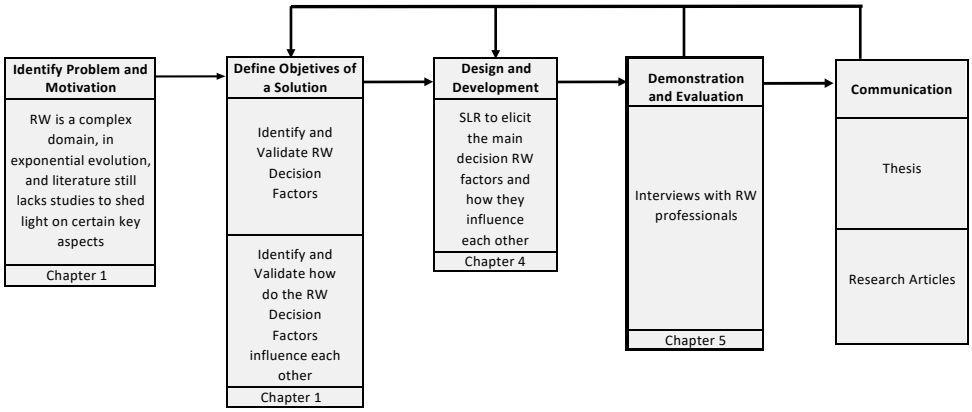

Figure 1- Applied DSRM guidelines

As can be seen at Figure 1, inside the DSRM it will also be applied a SLR and a set of semi-structured interviews.

3.2 Systematic Literature Review

In order to design and develop the artifact, the author performed a Systematic Literature Review to find out a set of remote work Advantages, Disadvantages, Challenges and Driving Forces as well as remote work concepts relation.

One of the major tools used in other domains to support an evidence-based paradigm is the generation of SLR, which is used to aggregate the experiences gained from a range of different studies in order to answer a specific research question [46].

A SLR is a literature review method that aims to address a problem by identifying, evaluating, integrating all relevant findings, and interpreting research on research topics to answer research questions based on the stages used in SLR [47]. The process of addressing the problem of lack of knowledge aims to identify the relationships and gaps in the existing literature. The identification process is used to describe directions for future research, because it consists of the process of formulating a general statement or an overarching conceptualization, commenting on, evaluating, extending, or developing theory from existing literature [47].

This research follows Kitchenhams Procedures for SLR [48], complemented by the centric approach from Webster and Watson [49], which encompass the following steps:

- **Planning.** It is necessary to confirm the need for such a review. It is also necessary to define the research question(s) that the systematic review will address and produce a review protocol (i.e. plan) which defines the basic review procedures.
- **Conducting.** Apply the review protocol previously designed in order to obtain studies which will be the object of the review.
- **Reporting.** The final phase of a systematic review, which involves writing up the results of the review and circulating these results to potentially interested parties.

The SLR will enable the development of the artifact that may then be evaluated and tuned with interviews.

3.3 Semi-structured Qualitative Individual Interviews

This study used semi-structured interviews with Professionals who had some type of RW experience. The study took place as a qualitative interview study in the tradition of the qualitative research interview, which allows the researcher to ask questions to different issues in the interviewees life-world, including practical issues of how to do things and cognitive issues such as personal and professional methodologies [50].

Compared to other research methods, one-to-one interviews allow to monitor the order in which the questions are answered, and to control the context of the interview, hence

avoiding possible biasing from the presence of other people [51]. Finally, the interviewing methodology is easily adjustable.

Semi-structured interviews are characterized by the use of a script consisting of closed or open predefined questions [52]. They are suitable when the research wants to validate several hypotheses but also to know the work field and to explore new ones [53].

Particularly, they enable the interviewee to discuss the subject matter without being too attached to the formulated inquiry and also facilitate the interviewer to have clear support following the questions [54]. Moreover, they ensure to researchers that their hypotheses or assumptions will be broadly covered by the conversation [55].

CHAPTER 4

Design and Development

As previously stated, the SLR is the chosen methodology to develop the artifact. For a better understanding, as well as to add more scientific rigor to the research, the concept-centric approach designed by Webster and Watson [49] is followed. Figure 2 details the SLR phases adopted.

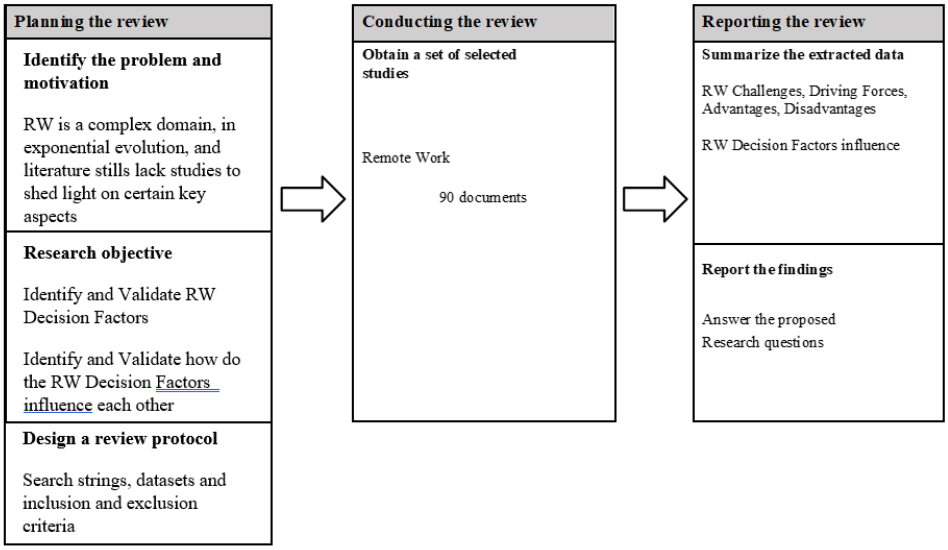

Figure 2- - SLR Methodology for RW Decision Factors

4.1 Planning the Review

In order to create this literature review, the author started by searching for documents in major databases, such as ACM, IEEE, Springer and Google Scholar between September and October of 2020. The following research string was used: (Remote OR Virtual) AND Work.

The documents were screened using five filters (Table 2): documents published during or after the year 2000, keyword present in the title, keyword present in the abstract and, finally, the fourth is a filter used for inclusion and exclusion criteria (Table 1), which consisted in an applied context filter manually customized by the author, exhaustively analyzing abstracts, introductions and conclusions in order to check if the document would fit in the research scope and address Remote and Virtual Work concepts. Finally, these documents are read in order to obtain the final selection of studies to perform the review. The filtration process is illustrated in Figure 3 and listed in Table 2.

Table 1- Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Written in English, Portuguese or Spanish	*Documents and books not available electronically;*
Documents that address specifically Remote and Virtual Work	*Documents not relevant for research;*
Documents publication year after 2000	*Documents were duplicates or not in context;*
	Documents publication year before 2000

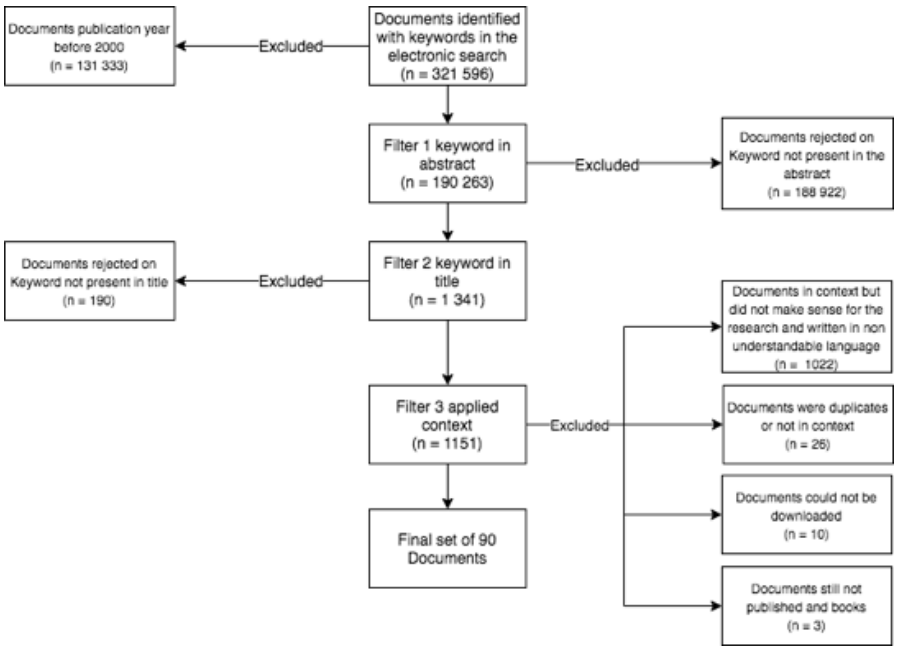

Figure 3- Review protocol

Table 2– SLR matrix of filtered research results

Database	Keywords	Total	Filter 1	Filter 2	Filter 3	Final Set
ACM	Virtual Work	6 771	6 216	117	38	6
	Remote Work	108 171	95 909	50	15	7
IEEEXPLORE	Virtual Work	20 433	2 109	56	9	12
	Remote Work	16 613	14 988	52	23	5
SpringerLink	Virtual Work	11 205	8 277	72	72	4
	Remote Work	1 003	864	9	9	3
Google Scholar	Virtual Work	145 000	51 800	806	806	41
	Remote Work	12 400	10 100	179	179	12
Total		321 596	190 263	1341	1151	90

4.2 Conducting the Review

By analysing Figure 4 it is possible to see the publications related to RW, distribution by keyword and year. Overall, the number of articles per year vary without considerable discrepancies.

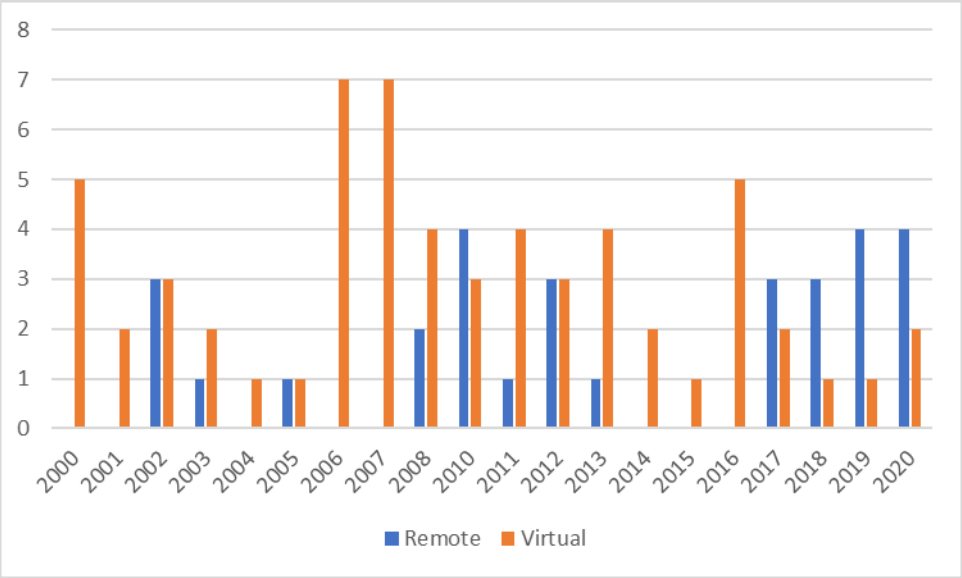

Figure 4 - RW Publications Distribution per year

It is also worth mentioning the apparent growth of the "Remote Work" keyword usage, as well as the decrease of the "Virtual Work" keyword since 2017.

The documents used in this research were, articles, papers, books and even thesis. Documents originated in journals or conferences; each have their own quality ranking. For journals we have a scale from Q4 to Q1, being Q1 the best. When talking about conferences the ranking goes from C to A (ERA rank) and B4 to A1(Qualis), being closer to A meant a better rank. The quality of our article base is presented in Figure 5. In terms of thesis and books there is no quality ranking, hence the N/A in the figure below.

The collected articles were published in several conferences and journals. The top 5 is present in Table 2 complemented by the Table A1 in the attachments, the top 5 of all the scopes and topics associated to them, while on the attachments. It stands out that RW domain is very well accepted in conferences and journals focused on "Business Management and Accounting".

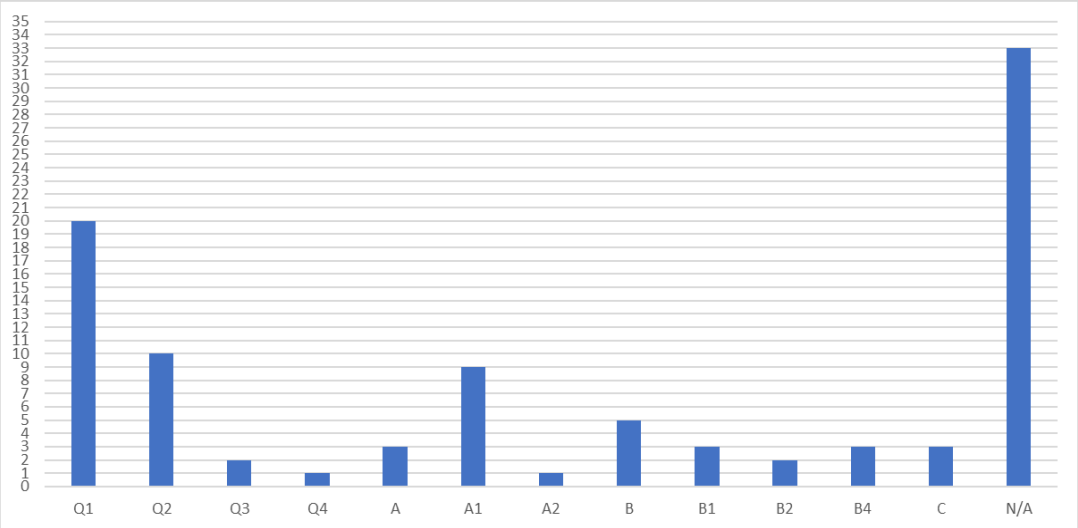

Figure 5 - Distribution of document ranks

Table 3 - Conferences, Journals and Subject Areas

Subject Area	**Count**
Business Management and Accounting	18
Computer Science	4
Social Sciences	4
Strategy and Management	3
Psychology	3
Conference	**Count**
Annual Hawaii International Conference on System Sciences	5
ACM Conference on Computer Supported Cooperative Work	2
Australasian User Interface Conference	2
International Conference on Human-Computer Interaction	2
ACM/IEEE International Conference on Software Engineering	1
Journal	**Count**
Journal of Management	2
Human Relations	2
Cornell Law Review	2
Baltic Journal of Management	2
International Arab Journal of Information Technology	2

4.3 Reporting the Review

After a thorough analysis of the selected literature, several possible instantiations of each decision factor were identified: Advantages (Table 4), Disadvantages (Table 5), Challenges (Table 6) and Driving Forces (Table 7).

The following tables detail the information collect regarding each topic as well as the respective references supporting them. The author adopted the concept centric approach proposed by Webster and Watson [49] to list the information.

4.3.1 Remote Work Factors and Critical Analysis (RQ1)

This section presents a brief description of the main RW decision factors found in literature to answer the former four RQs (RQ 1.1, RQ 1.2, RQ 1.3 and RQ1.4). The remaining RQs are approached in the next section.

When implemented correctly, RW can bring positive outcomes (advantages) [13], [24], [56], otherwise brings disadvantages [2], [26], [57] which can influence both the whole organization [24], [58] and its employees [59]. Consequently, organizational processes may also be affected with employees demotivation and the technological investments wasted [8].

To implement RW, an organization should first assess if this practice is aligned with its goals, values and objectives of the company for the future [60]. By doing it, organizations are avoiding some possible negative impacts of RW adoption [61] as well as a misalignment with the vision for the company future defined by the top management [62]. Once aligned, then it should bring advantages and value [63] accordingly to the organization.

In any other organizational initiative, challenges (Table 5) may arise. Such challenges can be fought by following a set of solutions and best practices to implement RW [16] since they facilitate the correct implementation of RW [4].

Driving forces are pointed in literature as relevant to organizations leading them to implement RW. They are normally categorized as value added to the organization since they can leverage employees capacities and decrease general costs and increase savings [7]. For example, they facilitate the way people perform processes using new technology and therefore help organizations overcome the existing challenges [41]. Overall, the

authors have elicited ten main driving forces (Table 6) for RW that should be aligned with each organization vision. For conciseness, only the most referenced are commented. Authors argue that "Technology is central to enabling these massive virtual collaborations" [18] and what makes "…virtual teams or some form of telework … possible" [2]. If Technology did not exist, then RW should not be possible. Regarding strategic thoughts it is quite consensual that for organizations in a globalized world "…distributed work system and distributed teams have become unavoidable" [5] and when successfully implemented it "…can transform an industry approach to work and the workplace" [13] creating competitive advantage [30]. In terms of Flexibility some authors argue that these remote groups "promise flexibility and responsiveness to the firm" [13] and at the same time to their families who "…do view this as a more flexible option" [24]. Not withstanding, RW also requires government support. For instance, mechanisms such as taxation and public spending helps government adding "…pressure on employers through legislative support…" [23]. Governments may also look to RW as something that can help in difficult situations like "…maintaining operations during a terrorist event." [10] and even more unpredictable events, such as pandemics like the Covid-19 virus in 2020 [64].

Moreover, some authors state that RW is "…a value added endeavor in any organization" [63] since it combines "…knowledge and perspectives to produce creative solutions to various business problems" [65].

With the emerging adoption of RW [5], organizations may face several challenges (Table 5) during its implementation. Some of the most pointed in literature are the Communication challenges imposed by virtuality, Management Challenges and Transparency Challenges. Such challenges must be considered by organizations in order to successfully implement RW. For example, one of the challenges is Convincing team members to use ICT effectively [15], as support tools, can enhance teamwork performance, but convincing team members to use them effectively remains an ongoing challenge.

Communication is seen as an "…essential backbone behind virtual work and organizations" [33] then challenges like "missing non-verbal cues in communication" [56] or "leads to unwanted interaction" [11] may rise and create some difficult situations like lack of "…awareness of distributed participants of each other actions…" [66]. In another perspective some authors defend that it is difficult for leaders to directly oversee

the work of others, since they are not there physically [67] and becomes harder to "… influence others…" [42]. At the end, this "…is what differentiates leadership in virtual teams from face to face teams" [42] and the "…worker experience manifests in multiple sites and contexts (physical, social, work, home) …" [67] which provides a greater challenge "…in terms of implementation, training, and guidance…" [24].

Transparency is also pointed in literature since RW lacks "… direct supervision…" [42] and also "…visibility within their team and the company they work for in general was a universal concern..." [16]. Plus, RW might affect Team Cohesion since "…non-co-located members of the teams experienced marginalization … from the team." [68]. This happens because "… an individual RWer spends the majority of the day working alone or working with strangers." [16]. Another topic pointed in literature is that RW brings an Impersonal Environment since "…many teams noticed a lack of relational interaction..." [68] which "...often leads to misunderstandings, incompatible ways of working, and conflicts among workers..." [30].

Even though RW brings challenges, many organizations have implemented it or are in the process to [69] due to the significant advantages to the organization [70] and respective workers [7].

Organizations may benefit from the implementation of RW by requiring that its employees need to work from home, reducing overheads [24], promoting the sustainability [11], or even benefit from the use of co-working space or other locations [7].

Among the most referenced advantages in literature (Table 4) authors point the Increased productivity and morale [14] where authors "… found that RW resulted in increased productivity in both supervisor and objective measures..." [63], and costs reduction [62] such as travel from home to office and return back home [11], purchasing new wear and savings on gasoline consumption [14] and workspace [71]. Other advantages are pointed out. For example, RW can also bring "…job satisfaction and reduced burnout…" [30] "…thereby increasing … organizational commitment." [23]. Workers autonomy is also highlighted. Some authors argue that RW brings "…perceived autonomy…" [63] and also increased availability [62] since organizations may "… increase the availability of skilled personnel…" [11]. Other advantage that RW brings is that workers who work from home "…can make more efficient use of time…" [39] and "…avoid office-based distractions and provide childcare-friendly scheduling." [7].

Despite the listed advantages, RW may also bring quite a few disadvantages (Table 4) for the organization. Remote workers may experience "…feelings of loneliness and isolation …" [62] and the "… balance of work and family life may be shaken…" [41]. Others argue that RW may increase work and stress load since "…working alone remotely means a considerable preparation overhead that becomes part of the daily workday…" [16] while it promotes "…anxieties around productivity and the interpretation of data by management…" [72] for workload. Plus, workers might feel "…frustration and stress from working across distance…" [30] given to "…uncompensated overtime work and often periods when people are required to work 24h…" [1]. Productivity may also be affected in the extent that RW may have a lot of interruptions because they "…have unlimited access to time-wasting websites, emails and social media …" [14] or because they may attempt "…to work with young children in the house…" [24] which may not be an easy context. RW can also bring problems to remote workers in the time it takes to perform activities "…the amount of time required to perform tasks is higher in comparison with traditional co-located teams…" [73] but also for non- remote workers "…since greater restrictions are placed upon them when coordinating and adjusting their own tasks and schedules…" [37].

Table 4– RW Advantages

ID	Advantage	References	Total
A1	*Increased productivity and morale*	[5], [8], [39], [42], [56], [61], [63], [68], [74]–[77], [13], [78]–[81], [14]–[16], [23], [24], [30], [31]	25
A2	*Reduced overall costs*	[4], [7], [8], [11], [14], [16], [23], [24], [30], [56], [57], [62], [69], [76], [80], [82]–[85]	19
A3	*Work life balance*	[7], [8], [72], [79], [84], [86], [87], [13], [16], [24], [29], [30], [56], [62], [70]	15
A4	*Job satisfaction and reduced burnout*	[2], [4], [81], [84], [6], [23], [24], [37], [57], [62], [70], [80]	12
A5	*Enhance positive associations between perceived task significance and global workers experienced meaningfulness*	[2], [21], [26], [29], [30], [56], [70], [76]	8
A6	*Enhance worker autonomy*	[8], [11], [23], [37], [72], [75], [79], [86]	8
A7	*Leverage remote expertise, establish competitive advantage in a dynamic market*	[2], [25], [29]–[31], [70], [76]	7
A8	*Enhance teamwork performance*	[13], [15], [16], [21], [23], [42]	6
A9	*Increased availability*	[8], [11], [31], [69], [78], [87]	6
A10	*Solve problems without the traditional requirements associated with collocation*	[13], [21], [23], [30], [42], [68]	6
A11	*Stimulates interaction with people from different backgrounds, which lead to more learning opportunities.*	[2], [26], [30], [31], [56]	5
A12	*Easier to disengage from work since work is done outside of office*	[11], [74], [88]	3
A13	*Workers less likely to avoid work if given the opportunity to work remotely or from home*	[11], [74], [75]	3
A14	*Task performance equal or better than in the of office*	[5], [83]	2
A15	*Less distractions and therefore we can make more efficient use of our time*	[7], [39]	2
A16	*Accelerate growth*	[3], [69]	2

Table 5– RW Disadvantages

ID	Disadvantages	References	Total
D1	*Feeling isolated and out of touch/Lack of physical interaction problems*	[4], [7], [9], [14], [16], [26], [29], [30], [35], [39], [42], [56], [57], [68], [69], [74], [80], [89], [90]	19
D2	*Balance of work, family and personal life problems*	[8], [9], [67], [76], [80], [81], [84], [90], [11], [21], [23], [24], [26], [37], [56], [62]	16
D3	*Increased workload*	[1], [4], [84], [90], [8], [11], [16], [24], [26], [37], [65], [72]	12
D4	*Stress load*	[1], [8], [84], [91], [16], [23], [24], [26], [30], [37], [57], [81]	12
D5	*Technology dependency problems*	[14], [26], [41], [56], [57], [62], [72], [74], [92], [93]	10
D6	*Communication problems*	[15], [16], [56], [57], [65], [68], [70], [72], [76], [87]	10
D7	*Time management problems*	[14], [16], [32], [56], [57], [68], [81], [84], [92]	9
D8	*Knowledge sharing problems*	[8], [9], [14], [37], [57], [68], [79], [89]	8
D9	*Infrastructure problems*	[11], [16], [19], [41], [74], [92], [93]	7
D10	*Conflict and coordination problems*	[1], [14], [42], [57], [68], [76]	6
D11	*Inclination to level harsher judgments against each other*	[8], [37], [38], [42], [84]	5
D12	*Interruptions*	[11], [14], [16], [24], [58]	5
D13	*Problems with time to perform tasks*	[37], [73]	2
D14	*Lack of monitoring*	[11], [72]	2
D15	*Fail to take charge and performing initializing actions*	[15]	1
D16	*Precariousness problems*	[90]	1
D17	*Leading complexity*	[11]	1

Table 6– RW Challenges

ID	Challenges	References	Total
C1	*Communication challenges imposed by virtuality*	[15], [19], [25], [26], [33], [39], [42], [56], [57], [62], [63], [66], [68]–[70], [74], [82], [87], [92]	19
C2	*Management challenges*	[1], [8], [11], [16], [19], [24], [25], [32], [42], [57], [63], [68], [69], [72], [76], [80], [82], [87]	18
C3	*Transparency challenges*	[6], [8], [70], [74], [76], [82], [84], [87], [88], [11], [13], [16], [21], [23], [30], [42], [67]	17
C4	*Technological challenges*	[3], [11], [68], [74], [87], [16], [17], [19], [26], [39], [56], [57], [62]	13
C5	*Challenges in maintaining team cohesion*	[1], [5], [68], [80], [82], [13], [16], [25], [30], [42], [56], [57], [67]	13
C6	*Training challenges*	[13], [15], [24], [70], [73], [75], [82], [87]	8
C7	*Impersonal environment*	[11], [13], [19], [25], [30], [68], [70], [74]	8
C8	*Convincing team members to use ICT effectively*	[11], [15], [62], [66], [69], [75], [82]	7
C9	*Willingness of members to expend effort*	[6], [11], [58], [70], [76], [82]	6
C10	*Knowledge fragmentation*	[8], [21], [30], [37], [68], [82]	6
C11	*Performance challenges*	[19], [24], [68], [81], [87], [94]	6
C12	*Security challenges*	[9], [11], [19], [39], [79]	5
C13	*Balance between formal and informal communication and documentation*	[11], [19], [37], [67], [82]	5
C14	*Lack of attendance*	[39], [80], [82]	3

Table 7– RW Driving Forces

ID	Driving Forces	References	Total
DF1	*Technology*	[2], [3], [38], [56], [62], [65], [73], [81], [84], [85], [87], [90], [8], [9], [11], [15], [18], [32]–[34]	20
DF2	*Collaboration improvement*	[2], [6], [8], [11], [21], [26], [30], [33], [37], [38], [56], [69], [73], [76], [79], [82], [85], [93]	18
DF3	*Organizational and individual strategic thoughts*	[5], [8], [72], [73], [76], [86], [92], [9], [11], [13], [16], [21], [24], [32], [41]	15
DF4	*Cultural and societal forces*	[5], [8], [9], [15], [23], [26], [30], [32], [67], [69], [85], [92], [93]	13
DF5	*Flexibility*	[2], [8], [41], [68], [10], [11], [13], [17], [23], [24], [30], [32]	12
DF6	*Technical competence and commitment*	[8], [33], [38], [41], [56], [57], [68], [69], [76], [78], [80], [85]	12
DF7	*Managing mobility and critical business interdependencies*	[8], [11], [95], [15], [33], [62], [65], [74], [81], [85], [93]	11
DF8	*Economic benefits*	[3], [8], [9], [11], [24], [38], [75], [84]	8
DF9	*Added value*	[2], [11], [21], [34], [63], [65]	6
DF10	*Government support*	[10], [23]	2

4.3.2 Decision Factors Relation (RQ2)

Based on the above findings it is interesting to analyse how the positive factors (Advantages and Driving forces) relate with the negative factors (Disadvantages and Challenges). Some of the listed advantages can only be achieved by mitigating some of the listed disadvantages and challenges. For instance, a worker that feels isolated (D1) or with a lack of balance between professional and family life (D2) will not be able to increase its productivity (A1) and be more realised with its job (A4). Plus, it will be hard to enhance teamwork performance (A8) and not avoid communication issues (D6 and C1). This relation is fairly explored in literature.

On the other hand, positive driving forces may incentivize RW implementation. However, it will probably be useless without a serious consideration of challenges. For instance, technical competence (DF6) and flexibility mindset (DF5) are useful but it will not help if some technological challenges (C4) or infrastructure problems (D9) emerged.

When worker demonstrate more job satisfaction (A4) coupled with the enhancement of the team performance (A8) it is natural to note more productivity and morale (A1) if communication challenges (C1) are avoided.

In case of being surrounded by cultural and societal (DF4) (external factors) unfavorable forces and if the whole organization, from management to the common workers, are not technically competent and do not have the necessary commitment (DF6) (internal factors) then it is almost impossible to expect an increase of productivity (A1) and disadvantages may easily rise.

Since it is easier for remote workers to disengage from work (A12) it might lead to a lack of attendance (C14), for example a worker can miss certain meetings if he does not see people "getting up " to go to the meeting room or if he falls asleep due to being alone "at work ", it is human nature, but when you are at the office those types of problems would be difficult to happen. This type of situations can lead to other another disadvantage for the worker, such as the Balance of work, family and personal life problems (D2), since the problem of falling asleep is normally due to the fact of a person not sleeping well. This is clearly a personal problem interacting with the workers job.

Promoting availability (A9) and remote expertise (A7) may lead to an increase productivity (A1) while avoiding geographic location (A10) issues. However, all this might crumble if companies and workers do not avoid management problems (C2).

By using different backchannels, workers may face challenges of balance between formal and informal communication and documentation (C13) which may lead to Communication problems (D6) but also stimulate interaction with people from different backgrounds, which leads to more learning opportunities (A11).

Virtualization environment (C1) forces organizations to equip workers with the necessary communication tools. This increases technological dependencies (D5) thus organizations may invest in monitoring systems to avoid lack of control (D14).

When not well managed, management challenges (C2) may reduce professional and social interaction between the employees (D1), between management (D10), which reduces workers " rights and connections to the organization (D11) and perturb the balance between work and life (D2).

Organizational and individual commitment (DF3) and competence (DF6) revealed that remote workers have less role coordination problems (D10) and can exhibited higher job satisfaction (A4), and even more commitment to the organization (A1).

When receiving less career support than Non-remote workers (C2) and feel an impersonal environment at your organization (C7) employees may experience more work-family conflicts (D2) influencing their turnover intentions, role stressors and job satisfaction (A4).

It is critical for remote workers to be available to learn new competences (DF6) and embrace flexibility (DF5) since the constant moving around increases the number of new people they meet (A11) and lead to more learning opportunities and needs to require new social skills and brings flexibility (A3). If remote workers do not use the ICT effectively (C8) then all the above-mentioned advantages will not be experienced.

Those who focus on the quality of teamwork (C5) while maintaining team cohesion makes an important impact not only on performance (A8) but also on job satisfaction (A4) in remote teams. Plus, organizations may be better able to respond to customers needs (DF9) by saving on the costs of office space (A2).

Yet, mobile technologies (DF1) can have a positive impact on workers by increasing their independence (A6) and flexibility (A3) as well as potentiate more real-time information about their jobs (A9). However, on the other hand, it may negatively impact their work, quality and relationships with others since workers need to adapt to new technologies and features that have to be learned. If these new skills are not acquired by remote workers, they can have conflict and coordination problems (D10) due to miss usage of the technology.

Which means that workers who are not willing to change or are a bit skeptical in terms of doing RW, ultimately will lead to constraints and performance breaks (C11). Other challenges and possible disadvantages can also be catalysed. For instance, RW employees can have problems of misunderstandings of judgement (D11) because of the virtual nature of communications, either from the voice tone or due to the signal cuts during teleconferences. If the worker is already against RW, then this type of situations can lead to the rupture of relationships between employees and even the relation between the worker and the organization.

Willing to cut costs (DF8) by reducing the number of fixed office places, organizations can better manage mobility and critical business interdependencies (DF7) since their workforce is globally distributed. This may increase both workers interaction with interesting strangers and different places to work (A11) and reflection times (A15). By being remote workers, it may increase employee self-regulation and control by enhancing the workers own autonomy (A6) by always having to manage their own pace, which brings ultimately productivity (A1) and happiness (A4) when they on board for more flexibility from the beginning (DF5).

Literature points that the influence of RW flexibility (DF5) for both the organization and the workers can be positive, more flexibility (A3) for the organization, and negative in terms of Balance of work, family and personal life problems (D2) for the employee.

If workers cannot properly balance their work, family and personal problems (D2) and/or deal with an increased workload (D3) it may lead to time management problems (D7) influencing conclusion of their tasks (D13).

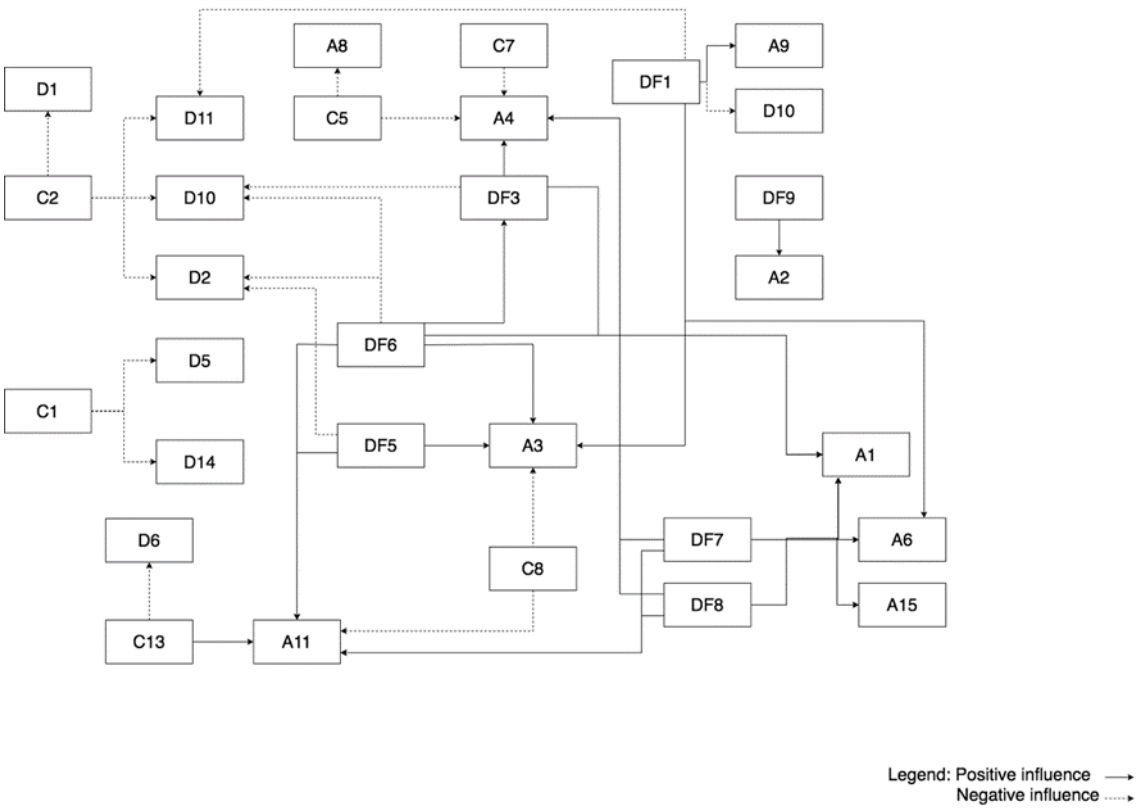

Figure 6– Decision factors relation

CHAPTER 5

Demonstration and Evaluation

Qualitative research interview allows the researcher to ask questions to different issues in the interviewees life-world, including practical issues of how to do things (Sayrs, 1998). Moreover, it is possible to monitor the order in which the questions are answered and avoid bias (Liguori, S. M., Selltiz, C., Jahoda, M., Deutsch, M., & Cook, 2007). Particularly, they enable the interviewee to discuss the subject matter without being too attached to the formulated inquiry (Jos, 2005) ensuring to researchers that their hypotheses or assumptions will be broadly covered by the conversation (Creswell, J. W. & Poth, 2018).

To demonstrate the proposed artifacts (RW decision factors tables and the diagram that shows the influences between the RW decision factors), 129 qualitative interviews were performed with RW professionals. The researcher divided the sample in 109 interviews for RQ1 (Table 9) and 20 for RQ2 (Table 9).

The first set of interviews was held to elicit more knowledge on the RW decision factors, with real life workers perception and to validate the Advantages, Disadvantages, Driving Forces and Challenges. The second set had the objective of validating, according to real-life experience, how each RW decision factor influences each other.

The interviews were all performed via the internet or via mobile communications, using tools such as Skype, Microsoft Teams, Jitsi Meet and Circuit for web calls, as well as Whatsapp and mobile voice calls for mobile communications.

These methods where chosen because of the cost effectiveness, ease of communication and actual state of pandemic (Covid-19) lived during the development of this study but most importantly because they enable a wider geographic scope (even globally), can deliver similar quality data and are equally as valid as face-to-face interviews. The 109 interviews were conducted between March and August 2020 while the other 20 were performed from August to September 2020.

5.1 Interviews Analysis (RQ1)

To elicit and answer the RQ1 as mentioned above the researcher made 109 individual qualitative interviews following the scrip presented in attachment A.

The script was developed by the researchers with the objective of answering to RQ1.1, RQ1.2, RQ1.3 and RQ1.4 while also providing more information on the general RW topics,

like the organizational culture, type of communication existent between the different levels of the organization and also how the company is prepared for RW in terms of infrastructure and protocols.

These interviews were performed to 32 female individuals and 77 male individuals. The sample is very varied considering employee type of role and areas of expertise, although most of the individuals perform roles in the IT industry as seen in the attachments table A2. The researchers asked a mixture of mostly open answer questions and a few closed answer questions, making a total of 48 questions.

In these interviews the author decided to validate the tables obtained from the literature, by presenting them to the interviees and asking one by one if they agreed or disagreed with them. This was done specifically to answer the proposed research questions from RQ1.1 to RQ1.4

The average age of the interviees was 31 years old and each interview took on average around one hour and twenty minutes. The shortest interview took 34 minutes and the longest took two hours and 28 minutes.

The same interviewer conducted all the 109 interviews ensuring that the same interview guides and protocols were used across all the interviews.

What workers think of RW compared with their perceived performance in RW

An interesting analysis to perform is to link the questions “Do you think RW is positive or negative?” and “How do you assess your remote work performance?”. The first one explores if the RW had a more positive or negative impact on workers, while the second relates on how interviewees perceived their performance as remote workers. This analysis intends to explore if workers performance is aligned with their perception of RW. The relation between these questions is present in Table 8.

Table 8 - RW perception VS RW performance

Q3.2.4 / Q3.2.11	N/A (1%)	Negative RW Perception (2%)	Neutral RW Perception (4%)	Positive RW Perception (81%)	Very positive RW Perception (12%)
N/A (1%)	1	-	-	-	-
Negative performance (0%)	-	-	-	-	-
Neutral Performance Impact (28%)	-	-	3	25	3
Positive Performance Impact (71%)	1	2	1	63	10

Very Positive Performance Impact (0%)	-	-	-	-	-

Looking at Table 8, 13 out of 109 interviewees consider RW very positive but none assumed that their performance was very positive. Indeed, most of these interviewees (10) argue that their performance was only positive and 3 state that was neutral. As far as the author could understand, this is due to the loss of socialization plus the "lack of physical queues", thus having 29 communication challenges is also impacting RWers performance negatively. But this point varies from person to person accordingly with their own personality, the introverts prefer Remote and the extroverts prefer working in the office.

Another factor impacting the users RW performance might be related to their home environment. For example, the household conditions, number of people in it and the existence of kids impacts the workers focus negatively, which causes drops in performance from very positive and positive to neutral performances (according to the opinion of the interviewees).

An additional considerable misalignment between interviewees opinion and practice worth to be discussed. From the 88 interviewees that believe that RW is positive, only 63 (71%) really performed accordingly. The remaining 25 reported a neutral effect in practice. According to their feedback, some workers try to work the same number of hours and with the same performance they had in the office. Some even add that they now have a clear positive outcome, which is the flexibility and time management granted from RW.

Even though our sample tends to a more negative side on an actual real-life situation, when talking about the perception of RW it is still very positive. Several interviewees report that they "lose less time during commute", they "reduce overall costs", they "win more time in general" and are more "motivated". Which means that, in the end, RW contributes very positively for the Work life balance.

Those who see RW as negative (2) or neutral (1) are residual and therefore there is not enough information to analyze and elicit conclusions.

For a lot of the workers RW is "very positive in normal situations but in a pandemic like situation it is just neutral", for others it was a ray of light in the middle of such a tough situation, because "if RW did not exist, then they would not have been able to start working". This means that pandemic was not the reason but the way in which the reason became evident.

Another major topic impacting RW nowadays is the pandemic (Covid-19). This is clearly impacting users, because several interviewees stated that "remote is good until it becomes too much", which is happening right now.

People have been working from home since March 2020. So, it is understandable that people are saturated and tired of it since they are 'locked', with family, friends and people that share their home for really long periods of time. This means that the pandemic reinforced some fewer positive aspects of RW, which can lead to less positive experiences and less objective ideas about the real potential of it.

Most successful achievements

The author has also questioned the interviewees about which goals do they think their organization have most success when adopting RW. The goals presented were a) cutting costs, b) obtain competitive advantage, c) optimize asset utilization, d) quick response to business and customer needs, e) improve the employee quality of life. The next Table 9 show us the distribution of the interviews answer for cutting cost.

Table 9 – Count of answers distribution

Answers	**A)**		**B)**		**C)**		**D)**		**E)**	
	Nº	**%**	**Nº**	**%**	**Nº**	**%**	**Nº**	**%**	**Nº**	**%**
1(No Success)	9	8	9	8	2	2	5	5	-	-
2(Minimum Sucess)	7	6	8	7	6	5	4	4	4	4
3(Neutral Success)	25	23	33	30	30	28	21	19	5	5
4 (Some Success)	40	37	37	34	34	31	45	41	23	20
5(Success)	26	24	20	19	35	32	32	29	75	69
N/A	2	2	-	2	2	2	2	2	2	2
Grand Total	**109**		**109**		**109**		**109**		**109**	

Before the interviews and according to the literature, the goals in which RW may have a bigger impact are a) cutting costs and e) improve the employee quality of life. As can be seen at Table 4, A2 (Reduced overall costs) and A4 (Job satisfaction and reduced burnout) have 19 and 12 references respectively.

On the other hand, from interviews the answers varied. Some interviewees reported that organizations really had success (5) with the implementation of RW, mainly improving the employee quality of life and optimizing asset utilization, while not cutting costs. This is interesting to mention because according to the literature only six authors seem to classify A9 (Increased availability) as an advantage, which is almost a third of the 19 that defended the advantage of saving money.

Based on the interviewees answers, this success results on the optimization asset utilization since employees see RW as a "way to avoid missing out work". Some interviewees argued, and literature confirmed, with RW workers feel less likely to avoid work (A13), increases availability (A9) and enables workers to make more efficient use of time (A15).

RW experience versus organizational culture

Another interesting analysis to perform is between the questions "How many years have you worked with this methodology?" and "Which specific character/s of your organizational culture do you find most important to your organization key achievements?". The first one tells us how much experience interviewees have as remote workers, while the second addresses the company culture on RW and if RW is important or not for their company business objectives.

Through the analysis of Figure 7 it is possible to see that overall, 77 out of the 109 interviewees already practiced RW (for instance, some work remotely once or twice a week while others in a nearshore approach) while the remaining 32 (values before the vertical black line) only performed or had the possibility to do RW with the Covid-19 pandemic.

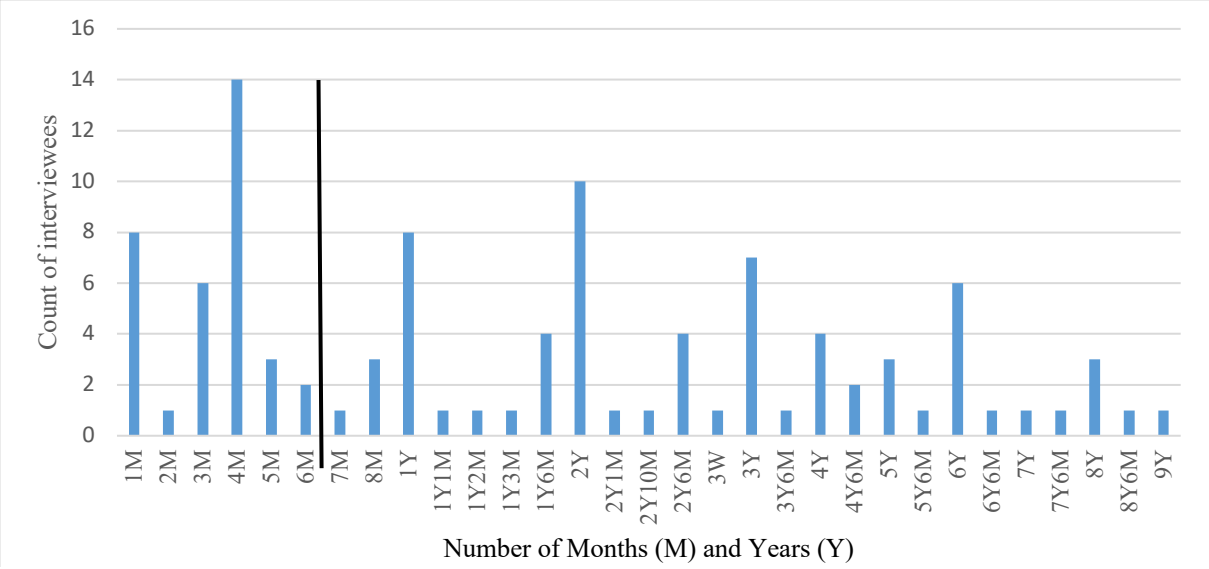

Figure 7- Interviewees RW Methodology Experience

Out of those who already performed RW before the pandemic, four of them believe that their companies did not have a RW structure that enables RW. For example, they argued that *"there is no structure but a mindset to make it happen"* while others believe that *"it is too early to know"*. Regarding pandemic context some interviewees state that *"the existing RW structure is not a general guideline for the company, and it could be that with the Covid-19 situation, it will really become one"*. The remaining, argue that their companies already have a good RW structure combined with the needed protocols and processes needed for a successful and safe RW practice including *"security protocols"* and considered in the *"company health insurance"*.

Interviewees argue that a *"good structure, well implemented"* and a *"clear support"* are critical. Infrastructure is also an important aspect. One interviewee argued that it is not easy to suddenly have *"160 000 workers connected to their virtual private networks with no crashes"*. This requires a mature and flexible infrastructure and inclusion of RW vision in company processes and policies as previously stated.

Most interviewees see RW as a necessary strategy. Among the main justifications, two pop up. Some interviewees argue that RW may help *"transversal teams"* with elements *"from different countries ...with different time zones"*. Others state that RW may be a good strategy to deal with the increasing need for *"flex office due to the lack of space for everyone, which clearly promotes RW"*. Others highlight that RW is a plausible and appreciated strategy, because they found themselves in a *"very liberal company, with few bureaucracies, which allows more freedom and autonomy for the remote workers"*.

On the other hand, from the remaining 32 interviewees who argue they are not used to do RW, 14 say their companies have a good RW structure and the other 18 say they do not have a good RW structure. This happens because 6 of the 18 just did not respond or did not think they had something to tell on this subject, either by being new to the company but also because they did not have such a wide vision of the company that would let them have a fair opinion on the subject.

Some interviewees argued that it was not as simple as having or not having a remote structure. These interviewees defend that the remote structure exists, but the adoption depends on the people in charge of the teams and the managers. They indicate the existence of a remote structure *"but the desire to use it effectively on the part of management does not yet exist"*.

Finally, 5 interviewees argued that in normal situations RW would not even be equationated, but with the appearance of Covid-19 companies were obligated to turn to RW. They argue that this horrible event had a positive effect in breaking a resilient change culture. For instance, some argue that "not at first, but now they are willing to adopt RW", or "before the pandemic no, but now with routine I think RW will continue".

Gender versus perception of RW and Gender versus performance in RW

An interesting analysis to perform is to explore how workers RW perception and performance is influenced by the workers gender. For this purpose, the author decided to use the answers for the gender of the interviewee and the questions regarding their RW perception and own performance in RW. As such, this analysis intends to investigate if there is any kind of relation between gender, performance, and interviewees perception. The relation between these questions is present in Figure 8 (on the left side of the black vertical line are the answers for the RW perception and on the right side are the answers for the RW performance).

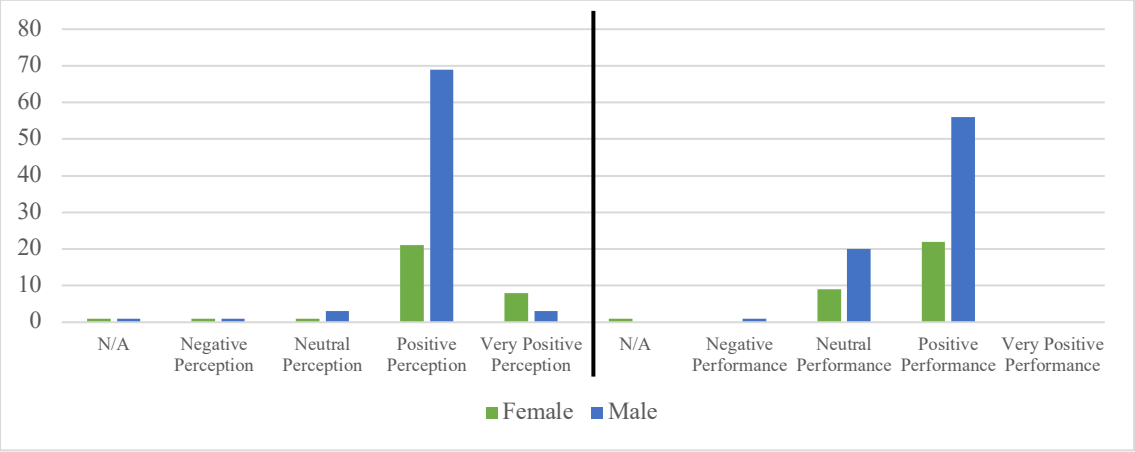

Figure 8- Gender VS perception of RW and Gender VS performance in RW

According to the literature some authors say that these remote groups "promise flexibility and responsiveness to the firm" [13] and at the same time to their families who "…do view this as a more flexible option " [24]. From the interviews performed in a general way having flexibility to and in the management of your workday brings the possibility of having more autonomy and such flexibility brings work-life balance.

Work-life balance and having more flexibility for many are the most important factors both on a personal level as well as for the company to achieve more improvements. In other words,

it is important in the sense that it gives more flexibility to employees and this can have a very positive impact on employee productivity. Because it gives flexibility to the person and well being, which even led interviewees to be much happier due to this flexibility.

One of the interviewees had a very interesting insight in relation to this topic: for him it depends on each person, it can be the best thing you give to someone, and ultimately brings more performance if the person is motivated. A manager will also pass certain ideas to the workers when giving them RW, that is, you have confidence in them, in their work and that they can consolidate personal and professional life. In contrast with unmotivated people we can have the reverse of the medal. But, in general, RW is perceived as more positive than negative. Within the Portuguese culture as a society, the feeling of being late at work is extremely relevant and workers often even get frowned upon when leaving at the right time, once normal working hours are over. RW is disruptive in this, because it changes the perception of work, it ceases to be something apart from your life to be part of it. This flexibility is very positive and entails no negative aspects for the worker. This will change the organizational culture, a change in which the work-life balance becomes one of the most important points.

RW also brings another advantage. Those who work from home "…can make more efficient use of time…" [39] and "…avoid office-based distractions and provide childcare-friendly scheduling." [7]. According with the interviews there are less distractions and more time management since workers do not need to commute to the physical office, which ultimately can facilitate personal commitments. RW makes it easier to focus and work more focused because one has fewer distractions from shared office spaces, such as colleagues, meetings and events, allowing for some flexibility with regards to personal tasks. Regarding the issue of being calmer and without distractions, it is important to have attention, because a certain level of self-control is needed in order to not lose focus.

It can also be negative because one may forget to make the normal breaks and be well and focused, which might end up making for longer hours than in the office – another problem that affects only a few employees and considered by some interviewees as the greatest possible distraction, is that they have children and can really have more distractions because of them, since with them in a way the house becomes a playground.

Lastly, according to the literature, productivity may also be affected in the extent that RW may have a lot of interruptions because workers "…have unlimited access to time-wasting websites, emails and social media …" [14] or because they may attempt "…to work with

young children in the house…" [24] which may not be an easy context. In real life situations according to our interviews the RW perception is only positive and the RW performance is actually very positive. This is interesting because normally it is seen that very positive perceptions would normally lead to positive or neutral perceived performances.

As one can see in Figure 8, Females tend to perceive RW more positively when compared with males. However, both females and males have the same evaluation of their RW performance. Overall, Females have more expectations about RW potential but tend to perform a bit lower of the perceived potential.

Company position/role versus RW performance

Another interesting analysis to perform is to compare the answers between the questions about the interviewees company position and their performance in RW. The first tells us the work role or position of the interviewee, while the second represents the performance of the worker in RW.

This analysis intends to explore if the workers performance of RW is affected by the worker role/company position. To see if there are any specific roles that impact the workers RW performance. The relation between these questions is present in the attachments Table A3.

Heading straight in to the numbers at Table A3, it can be seen that the sample is much in accordance to what was expected, because independently from where one works and what their role is, also at IT or at any other companies out there, these answers hardly depend on the interviewees point of view.

Because we clearly see an even distribution across the Table A3, 16 out of 32 of workers outside Organization A and 15 out of 32 of Organization A employees in our study see RW performance as neutral, whilst 31 out of 78 workers outside of Organization A and 47 Organization A employees out of 78 thought it was positive.

The most interesting thing to mention in this analysis vector is the inexistence of negative opinions, either from IT roles or Non-IT roles. In sum the out of the 109 interviewees no one saw RW as something negative.

Decision Factors Literature Tables Validation

To answer the RQ1, interviewees were asked to validate the findings from the literature. If they agreed, the interviewer would mark it with 1. When they disagreed, an explanation was provided. Figure 9 presents the count of positive (number 1) answers for each decision factor.

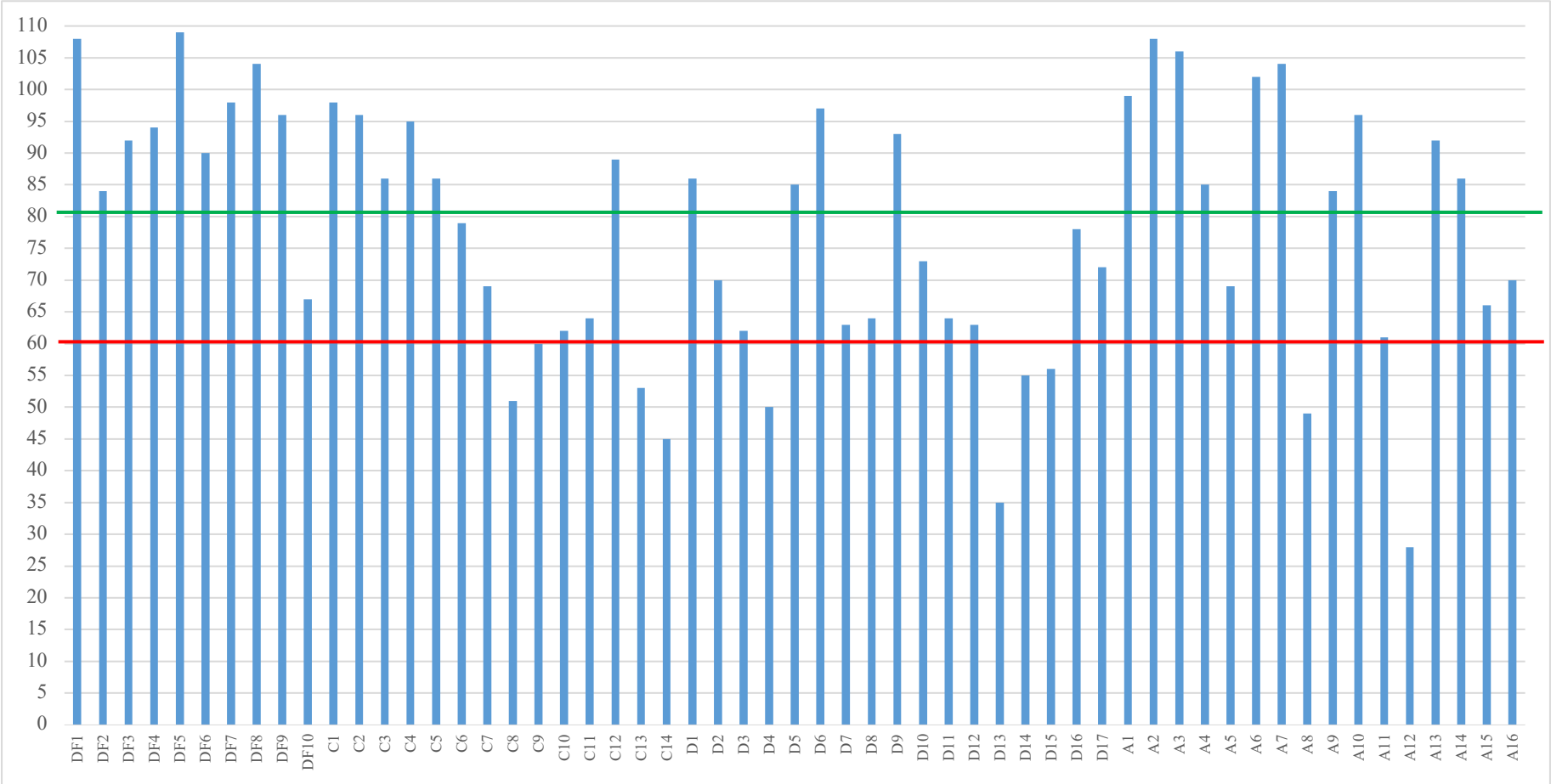

Figure 9- Count of interviewees which validate the RW factors

This figure has two colored lines, one red and one green. The topics with a value above the green line mean that the topic is confirmed by the opinion of the interviewees with 75% of them (81 interviewees) validating the topic. While the ones below the red line mean that only less than 55% of the sample (60 interviewees) agree with the literature opinion. Values between the red and green (55% and 75%) lines are assumed as ambiguous and should be further investigated in the future.

The author chose to analyse the factors that were below the red line, to provide further insights on the topics that were against the literature.

According with the interviewees, for C8 it is indifferent where a person is working because this challenge happens in RW but also in the office, actually it is essential for RW to function of properly. It always depends on the scope of the organization, because for some types of work RW is not a good fit, for example lawyer firms. It also depends on the generation to which the employee belongs, as newer generations tend to be more IT friendly. Furthermore, it also depends on the work methodology of each person because it is something reachable for anyone.

When asking the interviewees why they did not validate C13, the most common answers where that they only use the official channels, some told that the these mixtures already happen in the office where at any time informal and informal communications are made; some even said that it might be awkward in the beginning using the official channels but after some time people get used to it. If these exchanges are well defined by the organization and depending on its culture, then it will not be a problem.

For C14 the interviews showed that attendance actually became better with RW because most people are more available overall, and employees tend to have more respect for the time slots and frames defined. In order to not waste their own and their colleagues time, because honestly RW does not stop being work just because you are not at the office and of course it depends on the character of the employee to have the responsibility to not miss appointments.

In line with the interviews D4 was not validated because, according to the intervieews, this disadvantage will depend on the worker own emotional management. For most of the employees the stress levels did not grow in RW: actually they did not even feel more than the usual in the office, some even felt less, given that in RW no loss of time and patience occurs during commuting to work (the only occasion where this could happen would be in a pandemic-like state).

D7 is seen to depend, on the personality and personal management of the worker and, according to the interviews, the time management is or should be the same as in the office, with some interviewees even saying that it was the opposite and could be even considered as an advantage since everyone can manage their time at their own pace.

A similar feeling can be seen with D13, because, according to the interviews, this is something that also happens in the office, and it happens if there are constraints and ill intentions from colleagues. This disadvantage is easily mitigated with the existing collaborative tools available nowadays because “we are all one click away from each other”.

The last disadvantage D13 can actually be an advantage to the workers because they have less distractions in RW, and since the number of hours is the same in RW or in the office the work has to be done independently.

When talking about A8, the interviewees said that we should have improvements at a personal and individual level. But it can also lead to communication problems, for most of the sample it is not an advantage and can even be considered a disadvantage because now they end up wasting more time.

Finally, we have A12, which according to the interviews is something more difficult to do because in RWers are more available than what they would be in the office, since that in RW they end up having to setup their workstation in their living rooms and because of that they are close to the computer and anytime they receive a notification they go check it regardless of the hour of the day. This may lead to problems in disentangling the personal life from working life. Ultimately there are workers which have bigger disengaging capacities and some need to commute to completely turn off from work.

Top 5 Decision Factors (Literature versus Interviews before and after data presented) RO1

The next set of analysis vectors that the author decided to present, are the most important of this thesis. They contribute to the field of knowledge because they have the objective to confirm or refute the principal advantages, disadvantages, driving forces and challenges found in the literature. These are in fact the same according to the interviewees professional and personal experiences.

For this analysis the author decided to compile the three different opinions found with this study in Table 10, representing the real top five concepts for each type of RW decision factor.

On one side we have the opinions found in the SLR, while on the other we have two insights brought forward from the interviews performed.

These two insights come respectively from a few questions made on the interviews and which can be found in the attachments, the first set of questions before informed was made in the middle part of the interview. The author asked the interviewees what they thought, based on their opinion and experience, what the advantages, disadvantages, challenges and driving forces of RW were, without showing to them previously the decision factors tables.

The second set (after informed) was made towards the end of the interview, in the last three questions, after the author presented the literature tables and provided more insights and knowledge on the decision factors topics. Then the author inquired the interviewees on what the main factors to be considered when defining RW were, so that based on their opinion these would list the most impacting factors in a simpler and more defined way, regarding the top advantages, disadvantages, challenges and driving forces.

After the author compiled these data in Table 10, it can be seen that there is only one common advantage, besides work life balance, between the ones found in literature and those reported by interviewees: costs reduction. The reasons pointed by interviewees are on *"physical spaces (offices, hubs, etc.)"*; workers *"spend less money on their commute to work"*; and according to some interviewees *"also on their food"*.

For interviewees, the best advantage of RW is the Work life balance since RW allows them to better *"plan their own time"*, and it makes possible to *"balance their personal and professional life"*. For instance, aspects such as a doctor appointment, receiving parcels at home, or assisting older relatives, become much easier to execute. Some workers have also reported that the opportunity to watch their kids growing *"without neglecting your work"* is the greatest advantage. Time management was also pointed as an advantage. Workers exhibit many differences and have their preferences (e.g. some prefer to work by the morning others at late hours). This may affect workers performance. In the interviewees words: "Since we are responsible for our own work and the way we use our time, then any we can choose the best way to work and the best way to achieve the best results".

Interviewees were also asked for the disadvantages. Table 10 lists the top 5 disadvantages in interviewees opinion.

While for advantages, professionals and the literature agree in 3 of top 5 (Work life balance, Cost reduction and Productivity), with regards to the disadvantages there are two

commonalities. These are the lack of interaction and the balance of work, family and personal life problems, which can be clearly a big part of the distractions affecting workers performance at home.

Professional also pointed “communication” as an important issue. In our viewpoint is normal that this disadvantage pops up from professionals instead of the literature since they experience it in practice. This is very interesting to note since we are living in the digital era and the evolution of the available collaborative tools is supposedly advanced to the point where we should not have any kind of communication issues. This can happen due to several reasons like the *“lack of experience with the tools”, “network and connectivity issues that can freeze webcams”* and *”make cuts in the audio”* leading to misunderstandings or, in the worst-case scenario, to no communication at all.

The increase in workload identified in the literature was not reported by the interviewees. In fact, most of the interviewees argued that they were *“doing the same workload as in the office”*.

Table 10 - Literature versus Interviews before versus Interviews after

Literature		Interviews			
Top 5 Literature Advantages	**Count of References**	**Top 5 Interviews Advantages Before Informed**	**Count of Intervieews**	**Top 5 Interviews Advantages After Informed**	**Count of Intervieews**
Increased productivity and morale	25 (27%)	Work life balance	24 (22%)	Reduced overall costs	108 (99%)
Reduced overall costs	19 (21%)	Time management	18 (17%)	Work life balance	106 (97%)
Work life balance	15 (16%)	Reduced overall costs	16 (15%)	Leverage remote expertise and establish competitive advantage	104 (95%)
Job satisfaction and reduced burnout	12 (13%)	Less Distractions/Workers Focus	15 (13%)	Enhance worker autonomy	102 (93%)
Enhance worker autonomy	8 (8%)	Flexibility	8 (7%)	Increased productivity and morale	99 (90%)
Top 5 Literature Disadvantages	**Count of References**	**Top 5 Interviews Disadvantages Before Informed**	**Count of Intervieews**	**Top 5 Interviews Disadvantages After Informed**	**Count of Intervieews**
Feeling isolated/Lack of physical interaction	19 (21%)	Feeling isolated/Lack of physical interaction	37 (34%)	Communication problems	97 (88%)
Balance of work, family and personal life problems	16 (17%)	Balance of work, family and personal life problems	16 (15%)	Infrastructure problems	93 (85%)
Increased workload	12 (13%)	Communication problems	15 (14%)	Feeling isolated/Lack of physical interaction	86 (78%)
Stress load	12 (13%)	Needed Discipline	13 (12%)	Technology dependency problems	85 (77%)
Communication problems	10 (11%)	Too much Availability	8 (7%)	Precariousness problems	78 (71%)
Top 5 Literature Driving Forces	**Count of References**	**Top 5 Interviews Driving Forces Before Informed**	**Count of Intervieews**	**Top 5 Interviews Driving Forces After Informed**	**Count of Intervieews**
Technology	20 (22%)	Reduced overall costs	25 (22%)	Flexibility	109 (100%)
Collaboration improvement	18 (20%)	Benefits (Motivation, Comfort, Satisfaction, Trust, etc)	22 (20%)	Technology	108 (99%)
Organizational and individual strategic thoughts	15 (16%)	Work life balance	21 (19%)	Economic benefits	104 (95%)
Cultural and societal forces	13 (14%)	Flexibility	21 (19%)	Managing mobility and critical business interdependencies	98 (89%)
Flexibility	12 (3%)	Health Threats (Pandemic Covid 19)	12 (11%)	Added value	96 (88%)
Top 5 Literature Challenges	**Count of References**	**Top 5 Interviews Challenges Before Informed**	**Count of Intervieews**	**Top 5 Interviews Challenges After Informed**	**Count of Intervieews**
Communication challenges	19 (21%)	Needed Discipline	19 (17%)	Communication challenges	98 (89%)
Management challenges	18 (20%)	Communication challenges	18 (16%)	Management challenges	96 (88%)
Transparency challenges	17 (18%)	Technological challenges	16 (14%)	Technological challenges	95 (87%)
Technological challenges	13 (14%)	Management challenges	14 (12%)	Security challenges	89 (81%)
Challenges in maintaining team cohesion	13 (14%)	Challenges in finding the best tools and methodologies for RW	8 (7%)	Challenges in maintaining team cohesion	86 (78%)

5.2 How do the RW Decision Factors Influence Each Other (RQ2)

5.2.1 Literature versus Real-World Experience

Since RW is indeed a growing trend [96], the author decided to perform a more in-depth study regarding the RW concepts. The author wanted to explore and confirm how these relations between RW decision factors influence each other and how they really work on the real-world environment.

To do so, and as proposed by the author in the research objectives, it was made a decision to perform a set of semi-structured interviews, in order to elicit more concrete information on these topics.

5.2.2 Interviews

For our sample the author interviewed a total of 20 (16 males and 4 females) individuals. The author anonymized all participants and organizations, and every potentially identifying details were altered to protect confidentiality. Participants were recruited through the first and second author personal and professional contacts using the following criteria: uses technologies at work, more than 2 years of work experience and already performed RW.

The sample ranged in age from 23 to 51 and came mostly from Portugal. Additionally, we had participants from Brazil. Their roles varied from developer, to consultant, team leader, financial analyst, computer technician, teacher, coordinator, security tester, administrator, marketing and communication management, resulting in a sample consisting of several study areas, including IT, management, finance, marketing and education. Some of our participants also had children.

The author decided on making a set of semi-structured interviews, following a guide with a question for each RW decision factor relation (Figure 6). The author proceeded to start by asking participants if they though a relation existed between the factors and to provide an example or a justification for each of their answer. Sometimes the author had to provide examples or just state and exchange a few curiosities with the participants in order extract the most information possible out of each one of the participants.

The interviews were conducted through several collaborative tools, such as Microsoft Teams, Circuit, Skype or using more direct and informal forms of communications, using mobile phones to make calls, and also using WhatsApp.

Table 11 – Interviewees Characteristics RQ2

ID	Gender	Age	Country	Company	Role	Technology Experience (years)	RW Experience	Interview time
X1	♂	27	PT	Company A	Penetration Tester	9Y	9Y	1H06M
X2	♂	26	PT	Company B	Tech consultant	2Y6M	6M	1H02M
X3	♂	24	PT	Company C	Financial and Marketing Officer	2Y9M	6M	1H18M
X4	♀	33	BR	Company Q	Head of the Removal and Training Support Division of the People Training Coordination	8Y	6M	1H21M
X5	♂	24	PT	Company D	Full Stack Developer	2Y3M	9M	1H27M
X6	♂	34	BR	Company Q	Coordinator and Teacher of Distance Learning	16Y	6M	1H28M
X7	♂	23	PT	Company E	Computer Technician	2Y1M	6M	1H12M
X8	♂	51	PT	Company F	Team Leader of Development Teams	20Y	5Y	2H05M
X9	♂	27	PT	Company G	IT Consultant	5Y2M	6M	1H11M
X10	♀	25	PT	Company H	Developer	2Y6M	6M	1H00M
X11	♂	24	PT	Company I	Financial Analyst	4Y	1Y8M	1H17M
X12	♂	27	PT	Company J	SalesForce Developer	4Y	2Y	1H29M
X13	♂	25	PT	Company L	Software Developer	4Y	2Y1M	1H15M
X14	♂	24	PT	Company M	SAP Consultant	3Y2M	3Y2M	1H12M
X15	♀	26	PT	Company A	Communication Manager	6Y	8M	1H43M
X16	♂	36	BR	Company Q	Coordinator and Teacher of Distance Learning	16Y	6M	1H18M
X17	♂	26	PT	Company N	Developer Back-end	5Y2M	1Y8M	1H16M
X18	♂	34	PT	Company O	Team Leader of Development Teams	12Y	1Y	1H56M
X19	♀	24	PT	Company A	Developer Specialist Administrator	3Y	2Y	1H28M
X20	♂	24	PT	Company P	Due Diligence Officer	1Y2M	6M	1H33M

The date and communication method where mutually agreed between the author and the participants at a mutually agreed hour. The length of the interviews ranged from 60 to 120 minutes. A word document transcript was created for each interview, and was shared with the participants, yielding a total of 104 pages of text.

5.2.3 Reporting the Interviews Data

Once the interviews were performed, the author decided to summarize the answers in Table 12, shown in the next three pages and Figure 10.

Table 12 –Literature Versus Interviewees Answer

ID	Relation	SLR	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20	Interviewees influence (%)		
																							✓	-	×
1	DF1↔A3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100**	0	0
2	DF5↔A3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100**	0	0
3	DF7↔A4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100**	0	0
4	DF9↔A2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**100**	0	0
5	DF3↔A1	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**95**	5	0
6	DF6↔A11	✓	✓	✓	-	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**90**	5	5
7	DF6↔A3	✓	-	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**90**	5	5
8	DF7↔A6	✓	✓	-	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**90**	5	5
9	DF1↔A9	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	**85**	10	5
10	DF7↔A11	✓	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	**85**	10	5
11	DF6↔DF3	✓	✓	×	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	**85**	5	10
12	DF8↔A1	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	-	✓	-	✓	✓	✓	✓	**85**	10	5
13	DF1↔A6	✓	✓	-	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	**85**	15	0
14	DF8↔A4	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	✓	×	✓	-	✓	✓	✓	✓	**80**	15	5
15	DF3↔A4	✓	✓	-	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-	✓	-	✓	✓	✓	**80**	20	0
16	C7↔A4	×	-	×	×	×	×	✓	×	-	×	✓	×	×	×	×	×	×	×	×	-	×	10	15	**75**
17	DF6↔A1	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	-	✓	×	-	✓	✓	✓	✓	**70**	20	10
18	C13↔A11	✓	✓	✓	✓	×	✓	✓	✓	-	-	✓	-	✓	✓	✓	✓	✓	✓	-	-	×	**65**	25	10
19	DF7↔A15	✓	✓	-	-	✓	×	✓	✓	✓	-	✓	-	✓	✓	✓	✓	✓	×	×	✓	✓	**65**	20	15
20	DF5↔A11	✓	-	✓	-	✓	-	✓	-	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	**65**	20	15
21	C2↔D1	×	×	×	×	✓	×	✓	×	×	×	✓	×	×	✓	-	×	✓	×	✓	×	×	30	5	**65**
22	C1↔D5	×	×	×	×	-	×	×	×	-	✓	✓	×	×	×	×	×	-	×	✓	✓	×	20	15	**65**
23	C2↔D10	×	×	×	-	×	×	×	×	✓	×	×	×	✓	✓	×	×	×	-	✓	✓	-	25	15	**60**
24	C2↔D11	×	×	×	-	✓	×	×	×	-	×	×	×	×	✓	×	×	✓	-	✓	✓	×	25	15	**60**
25	DF5↔D2	×	×	×	×	×	✓	✓	×	✓	✓	×	×	×	✓	✓	-	-	×	×	×	×	30	10	**60**
26	C13↔D6	×	×	-	×	✓	✓	×	✓	×	×	×	×	✓	✓	✓	×	✓	-	×	-	×	35	15	**50**
27	C8↔A3	×	✓	✓	×	×	✓	×	×	✓	×	✓	×	✓	✓	✓	×	×	×	✓	✓	×	**50**	0	**50**
28	C5↔A4	×	×	×	✓	✓	×	✓	✓	-	×	✓	×	✓	✓	✓	×	×	×	✓	×	×	45	5	**50**
29	C1↔D14	×	-	×	×	✓	×	×	×	-	✓	-	✓	×	✓	×	-	-	×	✓	-	×	25	30	**45**
30	DF8↔A11	✓	✓	✓	×	×	✓	-	✓	×	-	✓	-	✓	✓	-	-	-	-	-	✓	✓	**45**	40	15
31	DF1↔D11	×	×	×	-	✓	×	✓	×	✓	✓	✓	×	✓	×	-	×	-	✓	✓	-	×	35	20	**45**
32	C2↔D2	×	×	×	-	-	×	✓	×	✓	×	✓	×	✓	✓	-	-	-	×	✓	✓	-	**35**	30	**35**
33	DF1↔D10	×	✓	×	✓	✓	×	✓	-	✓	×	✓	-	✓	✓	-	✓	×	✓	✓	×	×	**55**	15	30
34	C5↔A8	×	-	-	✓	✓	×	✓	×	✓	×	✓	×	✓	✓	✓	×	✓	✓	✓	✓	✓	**65**	10	25
35	DF6↔D2	×	✓	×	✓	-	✓	×	×	-	✓	✓	✓	✓	-	×	✓	-	×	✓	✓	✓	**55**	20	25
36	DF6↔D10	×	✓	×	✓	✓	×	✓	-	✓	✓	✓	×	✓	✓	✓	×	-	✓	✓	✓	-	**65**	15	20
37	DF3↔D10	×	✓	×	✓	✓	×	✓	-	✓	✓	-	✓	✓	✓	×	✓	✓	-	×	-	-	**55**	25	20
38	C8↔A11	×	✓	✓	-	✓	✓	✓	✓	✓	×	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	×	**80**	5	15

Label: ✓ - influences positively - no influence; × - influences negatively;

The first analysis performed by looking at these results already tells us a few interesting things. Out of the 38 relations identified, only 4 (DF1+A3), (DF5+A3), (DF7+A4), (DF9+A2) where completely confirmed (100% of the answers where according to what was expected from the literature), to influence in a positive way by the interviews.

Other aspect that pops out immediately from the beginning is that 68% of the relations are in accordance to a certain extent with the majority opinion of the employees, while 8% of the relations is divided in half in terms of opinion regarding, finally we have the interviews saying they disagree with the 24% of the relations.

Since most of the interviewees answers on the relations and influences where in consensus with the literature, then the most interesting relations to analyse are the ones that go against the literature.

But here we can see a clear pattern, out of those 10 relations, 9 are negative influences and only one is a positive influence, this already tells us that in the real-world, the RW adoption might not have as much negative influence as the author could have thought just by reading the literature and also people and organisations might have already found solutions or best practices to try.

Starting by the biggest RW enabler (Technology DF1). Regarding the first relation with adverse opinions (DF1-D10), we have participants stating that it is easier to organize tasks, people. Other interviewed said that the management should be the one trying to avoid it, if the workers are willing to be more understanding, it is easier to answer questions with so many media available. Another relation related to the technology is (DF1-D11), we have one interview who does not know if technology affects this but it really is a disadvantage not to be face-to-face because you lose quality in communication, it is up to the team spirit together with the managers management to make this transition, now it is necessary to have specific skills to work remotely, adaptation is an example of these skills, for a solution to this problem, one thing is if the communication channels are only written, but if it is spoken, people understand.

Next, we have the strategic thoughts, (DF3-D10), which according to one interviewer from her own experience there have been fewer conflicts than in the office, others say that it depends on the workers because when you are full RW you have to have a sense of responsibility that you are not on vacation but working, one even said that he would

not say they are related, coordination problems are definitely not a problem, but the conflict may exist but not to the extent of being a problem.

Now the author presents another enabler for RW, the organization and workers technical competence and commitment (DF6-D2), first we have mixed feelings on this topic because it can be both but it is more positive, because if you are competent and focused you end up doing it faster, but if it is too much it becomes negative, another neutral opinion says that technicians think that they do not cause this type of mixture, but the person own mentality. This does not impact because for some it is positive and for others negative, it is not the commitment but the original mentality of the person. A more positive approach to this relation says that if you are a committed person with the skills, you can more easily separate the two worlds as you find ways to combat this, for example through a separate office space.

Still on this topic (DF6-D10), the author also found neutral opinions regarding this relation, for example, one participant told us that there are no more or less conflicts it is neutral because it does not impact your conflict management. Another neutral opinion said that this problem has everything to do with how you express your commitment, because you are not face to face these problems can happen, but if the commitment exists it is possible to overcome these problems., But it was also found some positive recordings, in terms of the worker the greater the commitment, it will affect positively because if we are all in the same boat the problems of coordination and conflicts will decrease. For the company, in addition to having to give more guarantees in terms of conditions to work from home, it is important for the company to have a sense of how to manage employees, for example junior trainees to make knowledge transfer sessions if they do not have the capabilities, and to have more versatile and good collaborators, in order to guarantee a higher minimum standard

Now the author presents the last DF and the only positive influence where the interviews go against the literature (DF8+A11), It can be seen that we have more neutral answers, where the participants emphasized that they did not see any relationship between the two, it is the same as in the office and for another participant the economic benefits do not affect the learning opportunities. But the author also found negative answers where the worker said that only if it is reflected in prizes otherwise it does not matter and especially because you had an increase in personal expenses compared to the past. For some participants it is an opportunity for companies to reward their employees in an

economical way, since the employee enables himself to work from another country or in another time zone, then the company should give him more money at the end of the month (this is a common practice nowadays in big consulting companies). Also, an employee which is working from Portugal to Germany is already making savings, because the life cost in Germany is bigger than in Portugal.

Now we enter the realm of the challenges, and according to Figure 6, we should see the most negative influence, but actually the author found four relations that according to the participants are more positive influences than negative.

The first being (C1-D14), the opinions differ because although we are in RW, the technologies help to monitor more than normally, the management can see updates on the server and the interactions in groups, it is a type of reduced monitoring, but it exists. This relation also has to do with management failures because if you need to talk to A or B, you schedule with A and B a time slot for that, the problem of not being able to reach someone gets resolved this way and we have technologies for that such as the Microsoft Teams and Outlook, which enable meeting requests . Other participants even go further and say that if you have these challenges because the boss is bad then you will need to apply more strict monitoring and needs training for himself in management topics. For some is neutral, it depends on how things are managed, but in general yes is positive because things may not be what they seem, you could have just missed an update, but on the negative side today you have applications used by some employees to make the mouse move and make their status not go to away mode.

Another Challenge with a negative relation is the individual and organizational management (C2-D2), for some if the management is really well done then the employee will not mix these problems while others say it does not impact, because for him these two points are not related since he does not live with children and alone, if it were someone else with a different family context it could be negative, it also depends on how each person manages his own work, at an individual level it is a challenge, but it depends on the person if it is easier for him to manage his work and it could impact positively and vice versa. In terms of the upper management it has a negative impact, since working remotely it is more difficult to have access to people and to understand their situation. Another worker says that for him, management challenges can help because he can manage his work time and his personal time, but it can also be negative if he cannot manage this.

In RW a big challenge might be maintaining team cohesion which can influence (C5-A8) the teamwork performance. A participant told us that it can positively impact, in their own experience they had only good feedback tried to get positive, as it even thinks it can positively impact because a unit team has better synergies and as such better performance, in a particular case it increases a lot, this team (more mature) increased their cohesion and performance

Lastly we have the (C8-A11) if an employee knows all the communication channels, he will have the possibility / more opportunities to be able to interact with more people and if they can help the team to overcome this, it can even be an advantage and contribute to personal fulfillment, just teaching people to use these tools is new learning, but we also have mixed opinions because the fact that they do not know how to use it makes this interaction more difficult and time consuming as they will have to explain and how they may not know what makes the whole process more time consuming.

With these interviews the author confirmed that these 4 (DF1+A3), (DF5+A3), (DF7+A4), (DF9+A2) are validated from the literature and also from the workers perspective.

5.2.4 Interviews Results

Following the analysis of the data, the author decided to consider as valid the relations with results above or equal to 75%.

With this criterion the author narrowed down the relations from 30 to 16, which is close to only 42% of the previous relations identified in the literature giving us the updated model presented in the Figure 10.

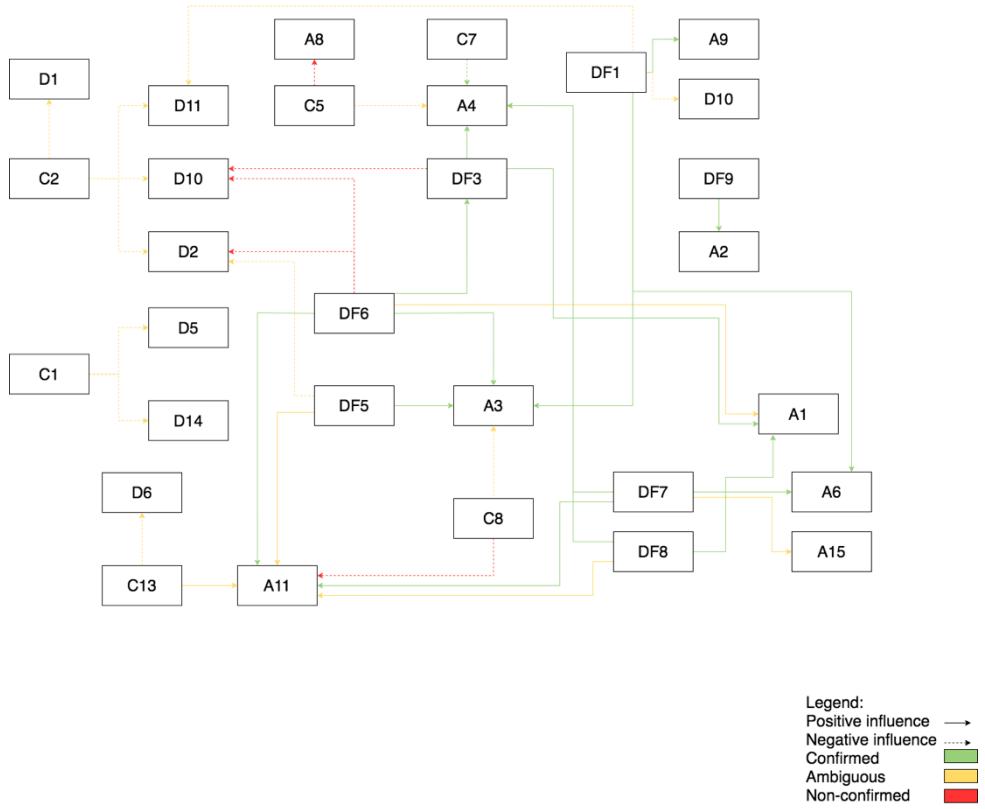

Figure 10 - Decision factors relation after analysing the interviews

It is very intriguing that we now do not have even one negative influence and only positive ones: out of these 16 relations only 5 had scores of 100% and they were all previous positive relations. These results might hint to the overall opinion that RW tends to be perceived as more positive than negative.

It should be noted that the positive results might be due to the sample composition, since we had an age average of 27 years and we also had a wide variety of roles form different business and knowledge areas, which could have impacted these results in a negative way at first glance. But actually, and accordingly with the literature from this digitalized era, most of the interviewed people were used to working with technologies.

These results could be further influenced by other factors, such as the organizational culture, management, personal and familiar environment of the worker and the lack of RW preparations, trainings, classifications, and commitment from both ends.

CHAPTER 6

Conclusions and Recommendations

In this research an SLR was conducted to respond to the call by researchers and practitioners for a deeper theoretical and practical understanding of RW decision factors and how they influence each other. Then, a total of 129 interviews were performed with RW practitioners. With their experience, the 109 interviewees helped to narrow down the real decision factors experienced in the real world, while the other 20 interviews served to elicit information on how do the decision factors influence each other.

At the end of this investigation, a set of RW decision factors and how they can influence each other are proposed and validated. Grounded on the previous sections one may argue that all the proposed Research Questions were answered:

- Regarding RQ1, which has four other questions associated (RQ1.1, RQ1.2, RQ1.3, RQ1.4), the main Decision Factors were elicited and described. The final list of decision factors dropped several concepts and ended up with 38 of the inicial 57 suggested by the literature. Out of those 38, the most validated factors according to the interviews for each type of decision factor were the following: DF1 (Technology), DF5 (Flexibility), DF8 (Economic benefits), A2 (Reduced overall costs), A3 (Work life balance), A7 (Leverage remote expertise, establish competitive advantage in a dynamic market), C1 (Communication challenges imposed by virtuality), C2 (Management challenges), C5 (Challenges in maintaining team cohesion), D5 (Technology dependency problems), D6 (Communication problems), D9 (Infrastructure problems).
- Concerning RQ2, the main influences between the RW Decision Factors have been also identified and detailed. Out of the original 38 relations, we ended up with 16 relations: DF1 (Technology) has a positive influence on the A3 (Work life balance), DF5 (Flexibility) has a positive influence on the A3 (Work life balance), DF7 (Managing mobility and critical business interdependencies) has a positive influence on the A4(Job satisfaction and reduced burnout), DF9 (Added value) has a positive influence on the A2 (Reduced overall costs), DF3 (Organizational and individual strategic thoughts) has a positive influence on the A1 (Increased productivity and morale).

6.2 Limitations

Regarding the limitations of this study, it was not possible to cover all RW topics given it is a methodology involving various categories and not only computer engineering. RW has a big impact on the workers relations, life, and way of addressing colleagues and work; as such, our study was limited to the topics found in the literature.

Although we can find older documents in the literature, they may not be completely up to date and content, which is prone to happen due to tremendously high pace of technological development.

Moreover, the quantity of RW practioneers is not that high. Due to our country context, RW is not something used with regularity, but is adopted in special cases like sickness and physical barriers, while the majority of the managers prefer physical work in order to better monitorize their employees work.

6.2 Future Work

In the future, further research should be carried out on the Decision Factors which were refuted by the interviews. This way it will be clear if they are, or not, to be considered, because several other factors can impact the results obtained, such as the country, organizational and individual culture, possibly causing the values obtained in this study to fluctuate, and in some cases even validate or refute some of the decision factors.

Also, this exact same study could be conducted in a non-pandemic like state as the one lived during the year 2020 (Covid-19).

Another area for research on the Decision factors is the exact same opposite with the ones validated by this study, in order to double check their veracity.

Also, it would be interesting to deeply explore the way these decision factors relate with each other with several case studies in organizations. Another very interesting topic for future research would be to understand which types of jobs/roles and organization culture work best or worst for RW adoption.

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Attachments

Attachment A - First Set of Interviews Script (RQ1.1- RQ1.4)

1 General Questions

Q1.1 Name:

Q1.2 Age:

Q1.3 Gender:

Q1.4 Company position:

Q1.5 Nationality:

Q1.6 How long have you worked for the company?

Q1.7 How long in general and/or with technology?

Q1.8 How many years have you worked with this methodology?

Q1.9 Field Area?

Q1.10 What kind of job do you do?

Q1.11 What positions have you held while in remote work?

Q1.12 What are the other people job positions that you are in contact with directly in the organization?

2 Team Leader Questions

Q2.1 - Number of teams you manage?

Q2.2 - Number of employees you manage?

Q2.3 - Do you implement Home-office in your teams? Why Home-office?

Q2.4 - In what form? Number of days?

Q2.5 - Do you assign the same number of days to all employees? If not, what are the reasons and to what type of workers?

Q2.6 - How many RW days more or less?

Q2.7 - Are you in favor of this working methodology? Why?

3 Remote Work Questions

If RW was never done:
Q3.1.1 Why?

Q3.1.2 You did not want too or never had the chance?

Q3.1.3 If you did not want. Why?

Q3.1.4 If you never had a chance, would you like too?

If you practiced RW:
Q3.2.1 Do you still do it?

Q3.2.2 How long have you been doing it?

Q3.2.3 How many days a week do you do it?

Q3.2.4 Do you think it is positive or negative?

Q3.2.5 How do you define the organizational culture of departments adopting remote work? Is it similar to the entire organization and other business and functional units?

Q3.2.6 Which specific character/s of your organizational culture do you find most important to your organization key achievements?

Q3.2.7 As you see it (PT No seu entender):

- Q3.2.7.1 What motivations might lead to the implementation of RW?
- Q3.2.7.2 What advantages do you identify?
- Q3.2.7.3 What disadvantages do you identify?
- Q3.2.7.4 What challenges do you identify?

Q3.2.7.5 Have you experienced any of these concepts?

Q3.2.8 In relation to the Challenges and Disadvantages you have experienced, how have you solved them?

- Q3.2.8.1 If not solved, why?

RW Decision Factors Table Validation

ID	Advantage	References	Total	0/1
A1	*Increased productivity and morale*	(Angelaccio and D "Ambrogio, 2007; Ayoko et al., 2012; Beise et al., 2010; Calvo, 2013; Chungade and Kharat, 2018; Ehsan et al., 2008; Elshaiekh et al., 2019; Felstead and Henseke, 2017; Fields and Miller, 2000; Institution of Electrical Engineers., 2001; Jones Jr., 2011; Koehne et al., 2012; Mattarelli and Tagliaventi, 2010; Moradi et al., 2018; Nurmi and Hinds, 2016; Publishing, 2002; Raghuram et al., 2001; Reilly et al., 2012; Richter et al., 2006; Robert, 2013; Verburg et al., 2006, 2013; Wheelan et al., 2016; Wilson, 2006)	25	
A2	*Reduced overall costs*	[4], [7], [8], [11], [14], [16], [23], [24], [30], [56], [57], [62], [69], [76], [80], [82]–[85]	19	
A3	*Work life balance*	[7], [8], [72], [79], [84], [86], [87], [13], [16], [24], [29], [30], [56], [62], [70]	15	
A4	*Job satisfaction and reduced burnout*	[2], [4], [81], [84], [6], [23], [24], [37], [57], [62], [70], [80]	12	
A5	*Enhance positive associations between perceived task significance and global workers experienced meaningfulness*	[2], [21], [26], [29], [30], [56], [70], [76]	8	
A6	*Enhance worker autonomy*	[8], [11], [23], [37], [72], [75], [79], [86]	8	
A7	*Leverage remote expertise, establish competitive advantage in a dynamic market*	[2], [25], [29]–[31], [70], [76]	7	
A8	*Enhance teamwork performance*	[13], [15], [16], [21], [23], [42]	6	
A9	*Increased availability*	[8], [11], [31], [69], [78], [87]	6	
A10	*Solve problems without the traditional requirements associated with collocation*	[13], [21], [23], [30], [42], [68]	6	
A11	*Stimulates interaction with people from different backgrounds, which lead to more learning opportunities.*	[2], [26], [30], [31], [56]	5	
A12	*Easier to disengage from work since work is done outside of office*	[11], [74], [88]	3	
A13	*Workers less likely to avoid work if given the opportunity to work remotely or from home*	[11], [74], [75]	3	
A14	*Task performance equal or better than in the of office*	[5], [83]	2	
A15	*Less distractions and therefore we can make more efficient use of our time*	[7], [39]	2	
A16	*Accelerate growth*	[3], [69]	2	

Table 4 – *Remote Work Advantages*

ID	Disadvantages	References	Total	0/1
D1	*Feeling isolated and out of touch/Lack of physical interaction problems*	[4], [7], [9], [14], [16], [26], [29], [30], [35], [39], [42], [56], [57], [68], [69], [74], [80], [89], [90]	19	
D2	*Balance of work, family and personal life problems*	[8], [9], [67], [76], [80], [81], [84], [90], [11], [21], [23], [24], [26], [37], [56], [62]	16	
D3	*Increased workload*	[1], [4], [84], [90], [8], [11], [16], [24], [26], [37], [65], [72]	12	
D4	*Stress load*	[1], [8], [84], [91], [16], [23], [24], [26], [30], [37], [57], [81]	12	
D5	*Technology dependency problems*	[14], [26], [41], [56], [57], [62], [72], [74], [92], [93]	10	
D6	*Communication problems*	[15], [16], [56], [57], [65], [68], [70], [72], [76], [87]	10	
D7	*Time management problems*	[14], [16], [32], [56], [57], [68], [81], [84], [92]	9	
D8	*Knowledge sharing problems*	[8], [9], [14], [37], [57], [68], [79], [89]	8	
D9	*Infrastructure problems*	[11], [16], [19], [41], [74], [92], [93]	7	
D10	*Conflict and coordination problems*	[1], [14], [42], [57], [68], [76]	6	
D11	*Inclination to level harsher judgments against each other*	[8], [37], [38], [42], [84]	5	
D12	*Interruptions*	[11], [14], [16], [24], [58]	5	
D13	*Problems with time to perform tasks*	[37], [73]	2	
D14	*Lack of monitoring*	[11], [72]	2	
D15	*Fail to take charge and performing initializing actions*	[15]	1	
D16	*Precariousness problems*	[90]	1	

Table 5 – *Remote Work Disadvantages*

ID	Challenges	References	Total	0/1
C1	*Communication challenges imposed by virtuality*	[15], [19], [25], [26], [33], [39], [42], [56], [57], [62], [63], [66], [68]–[70], [74], [82], [87], [92]	19	
C2	*Management challenges*	[1], [8], [11], [16], [19], [24], [25], [32], [42], [57], [63], [68], [69], [72], [76], [80], [82], [87]	18	
C3	*Transparency challenges*	[6], [8], [70], [74], [76], [82], [84], [87], [88], [11], [13], [16], [21], [23], [30], [42], [67]	17	
C4	*Technological challenges*	[3], [11], [68], [74], [87], [16], [17], [19], [26], [39], [56], [57], [62]	13	
C5	*Challenges in maintaining team cohesion*	[1], [5], [68], [80], [82], [13], [16], [25], [30], [42], [56], [57], [67]	13	
C6	*Training challenges*	[13], [15], [24], [70], [73], [75], [82], [87]	8	
C7	*Impersonal environment*	[11], [13], [19], [25], [30], [68], [70], [74]	8	
C8	*Convincing team members to use ICT effectively*	[11], [15], [62], [66], [69], [75], [82]	7	
C9	*Willingness of members to expend effort*	[6], [11], [58], [70], [76], [82]	6	
C10	*Knowledge fragmentation*	[8], [21], [30], [37], [68], [82]	6	
C11	*Performance challenges*	[19], [24], [68], [81], [87], [94]	6	
C12	*Security challenges*	[9], [11], [19], [39], [79]	5	
C13	*Balance between formal and informal communication and documentation*	[11], [19], [37], [67], [82]	5	
C14	*Lack of attendance*	[39], [80], [82]	3	

Table 6 – *Remote Work Challenges*

ID	Driving Forces	References	Total	0/1
DF1	*Technology*	[2], [3], [38], [56], [62], [65], [73], [81], [84], [85], [87], [90], [8], [9], [11], [15], [18], [32]–[34]	20	
DF2	*Collaboration improvement*	[2], [6], [8], [11], [21], [26], [30], [33], [37], [38], [56], [69], [73], [76], [79], [82], [85], [93]	18	
DF3	*Organizational and individual strategic thoughts*	[5], [8], [72], [73], [76], [86], [92], [9], [11], [13], [16], [21], [24], [32], [41]	15	
DF4	*Cultural and societal forces*	[5], [8], [9], [15], [23], [26], [30], [32], [67], [69], [85], [92], [93]	13	
DF5	*Flexibility*	[2], [8], [41], [68], [10], [11], [13], [17], [23], [24], [30], [32]	12	
DF6	*Technical competence and commitment*	[8], [33], [38], [41], [56], [57], [68], [69], [76], [78], [80], [85]	12	
DF7	*Managing mobility and critical business interdependencies*	[8], [11], [95], [15], [33], [62], [65], [74], [81], [85], [93]	11	
DF8	*Economic benefits*	[3], [8], [9], [11], [24], [38], [75], [84]	8	
DF9	*Added value*	[2], [11], [21], [34], [63], [65]	6	
DF10	*Government support*	[10], [23]	2	

Table 7 – *Remote Work Driving Forces*

Q3.2.9 How is the communication between different decision makers and how often it is?

Q3.2.10 How do you define the remote work structure in your organization?

Q3.2.11 How do you assess your remote work performance?

Q3.2.12 How important are these topics to departments adopting remote work? On a scale of 1 (lowest) to 5 (highest)

- A)__ Being innovative
- B)__ Team work and collaboration
- C)__ Controlling and monitoring network performance
- D)__ Aggressive completion and customer focus

Objective priorities:
Q3.2.13 Which one of the above issues (A),B),C),D)) do you find more important when seeking to cut costs ? 1.__

Q3.2.14 Which one of the above issues (A),B),C),D)) do you find more important when seeking to obtain competitive advantage? 1.__

Q3.2.15 Which one of the above issues (A),B),C),D)) do you find more important when seeking to optimize asset utilization? 1.__

Q3.2.16 Which one of the above issues (A),B),C),D)) do you find more important when seeking quick response to business needs? 1. __ 2. __

Q3.2.17 Which one of the above issues (A),B),C),D)) do you find more important when seeking improve the employee “s quality of life? 1. __ 2. __

Q3.2.18 What are the main factors to be considered when defining remote work?
1 – Positive factors:__ 2 – Negative factors:__

Objectives results:
Q3.2.19 Which of the following goals do you think your organization has had the most success with the adoption of remote working? On a scale of 1 (lowest) to 5 (highest)
a. __ cutting costs b. __ obtain competitive advantage c. __ optimize asset utilization d. __ quick response to business and customer needs e. __ improve the employee “s quality of life

Q3.2.20 Is there a commentary that you consider important about the relationship between culture, remote work and performance?

Attachment B - Second Set of Interviews Script (RQ2)

RW Decision Factors Influence

DF1(Technology) impacts positively A3(More flexibility because it allows more freedom for the remote workers to plan their work and personal life)

DF1(Technology) impacts positively A6(Enhance worker autonomy)

DF1(Technology) impacts positively A9(Increased availability)?

DF1(Technology) impacts negatively D10(Conflict and coordination problems)

DF1(Technology) impacts negatively D11(Inclination to level harsher judgments against each other)?

DF3(Organizational and individual strategic thoughts) impacts positively A1(Increased productivity and morale)

DF3(Organizational and individual strategic thoughts) impacts positively A4(Job satisfaction and reduced burnout)?

DF3(Organizational and individual strategic thoughts) impacts negatively D10(Conflict and coordination problems)?

DF5(Flexibility) impacts positively A3(More flexibility because it allows more freedom for the remote workers to plan their work and personal life)

DF5(Flexibility) impacts positively A11(Stimulates interaction with people from different backgrounds, which lead to more learning opportunities)?

DF5(Flexibility) impacts negatively D2(Balance of work, family and personal life problems)?

DF5(Flexibility) impacts negatively DF6(Technical competence and commitment) impacts positively A1(Increased productivity and morale)

DF5(Flexibility) impacts negatively A3(More flexibility because it allows more freedom for the remote workers to plan their work and personal life)

DF5(Flexibility) impacts negatively A11(Stimulates interaction with people from different backgrounds, which lead to more learning opportunities)

DF5(Flexibility) impacts negatively DF3(Organizational and individual strategic thoughts)?

DF6(Technical competence and commitment) impacts negatively D2(Balance of work, family and personal life problems)

DF6(Technical competence and commitment) impacts D10(Conflict and coordination problems)?

DF7(Managing mobility and critical business interdependencies) impacts positively A4(Job satisfaction and reduced burnout)

DF7(Managing mobility and critical business interdependencies) impacts positively A6(Enhance worker autonomy)

DF7(Managing mobility and critical business interdependencies) impacts positively A11(Stimulates interaction with people from different backgrounds, which lead to more learning opportunities)

DF7(Managing mobility and critical business interdependencies) impacts positively A15(Less distractions and therefore we can make more efficient use of our time)?

DF8(Economic benefits) impacts positively A1(Increased productivity and morale)

DF8(Economic benefits) impacts positively A4(Job satisfaction and reduced burnout)

DF8(Economic benefits) impacts positively A11(Stimulates interaction with people from different backgrounds, which lead to more learning opportunities)?

DF9(Added value) impacts positively A2(Reduced overall costs)?

C1(Communication challenges imposed by virtuality) impacts negatively D5(Technology dependency problems)

C1(Communication challenges imposed by virtuality) impacts negatively D14(Lack of monitoring)?

C2(Management challenges) impacts negatively D1(Feeling isolated and out of touch/Lack of physical interaction problems)

C2(Management challenges) impacts negatively D2(Balance of work, family and personal life problems)

C2(Management challenges) impacts negatively D10(Conflict and coordination problems)

C2(Management challenges) impacts negatively D11(Inclination to level harsher judgments against each other)?

C5(Challenges in maintaining team cohesion) impacts negatively A4(Job satisfaction and reduced burnout)

C5(Challenges in maintaining team cohesion) impacts negatively A8(Enhance teamwork performance)?

C7(Impersonal environment) impacts negatively A4(Job satisfaction and reduced burnout)?

C8(Convincing team members to use ICT effectively) impacts negatively A3(More flexibility because it allows more freedom for the remote workers to plan their work and personal life)?

C8(Convincing team members to use ICT effectively) impacts negatively A11(Stimulates interaction with people from different backgrounds, which lead to more learning opportunities)?

C13(Balance between formal and informal communication and documentation) impacts positively A11(Stimulates interaction with people from different backgrounds, which lead to more learning opportunities)?

C13(Balance between formal and informal communication and documentation) impacts negatively D6(Communication problems)?

Attachment C – Full table of Conferences, Journals and Subject Areas

Table A1 - Full table of Conferences, Journals and Subject Areas

Investigation Nature
Marketing
Business Management and Accounting
Small Group Research
Psychology
Business Economics
Computer Networks and Communications
Computer Science
Arts and Humanities
Social Sciences
Agricultural and Biological Sciences
Information Systems and Management
Strategy and Management
Conferences & Journals
Australasian User Interface Conference
ACM Conference on Computer Supported Cooperative Work
International Conference on Computer Graphics, Virtual Reality, Visualisation and Interaction in Africa
IEEE International Conference on Global Software Engineering
Annual Hawaii International Conference on System Sciences
Iberian Conference on Information Systems and Technologies
ACM Virtual Reality Software and Technology
ACM/IEEE International Conference on Software Engineering
IEEE Engineering Education Conference
Management of Innovation and Technology International Conference
ACM Special Interest Group on Supporting Group Work
International Conference on Human-Computer Interaction
European Management Journal
Revista de Psicologia del Trabajo y de las Organizaciones
Information Systems Research
Journal of Occupational and Organizational Psychology
International Journal of Networking and Virtual Organisations
Work Organisation, Labour and Globalisation
Journal of Global Information Technology Management
Communication Monographs
Industry and Innovation
Journal of International Business Studies
New Technology, Work and Employment
Communications of the ACM
Human Resource Management
Information Resources Management Journal

Journal of Vocational Behavior
Spanish Journal of Marketing
Human Relations
Journal of Management
International Journal of Project Management
Advances in Human Performance and Cognitive Engineering Research
Baltic Journal of Management
International Journal of Advanced Corporate Learning
International Arab Journal of Information Technology
Journal of Leadership and Organizational Studies
International Journal on Advanced Science, Engineering and Information Technology
International Conference on Multimodal Interfaces
Conference on Human Factors in Computing Systems
IEEE International Conference on Virtual Environments Human-Computer Interfaces and Measurement Systems
International Workshop on Groupware
Symposium on Information Technology and Information Systems
International Conference on Collaborative Computing: Networking Applications and Worksharing
ACM International Conference on Emerging Networking Experiments and Technologies

Attachment D - RQ1 Interviews Characteristics

Table A2 - RQ1 Interviews Characteristics

ID	Gender	Age	Country	Technology Experience (Years)	RW Experience (Years)	Interview Time (Minutes)	Role
X1	♂	27	PT	3Y	6M	40	Junior Consultant
X2	♂	51	PT	30Y	1Y	58	Analyst, Developer, Tester
X3	♀	25	PT	9M	4M	45	Data Scientist Trainee
X4	♀	25	PT	2Y	1M	45	Trainee Product Owner
X5	♂	25	PT	4Y	8M	52	Software Developer
X6	♀	41	PT	19Y	6Y	54	Planning, controlling, and reporting Team Leader
X7	♀	46	PT	23Y	4Y	48	Service Manager
X8	♀	41	PT	20Y	2Y6M	60	Software Tester
X9	♀	26	PT	4Y	1Y	43	Project Management Officer
X10	♂	31	PT	6Y	2M	86	Developer
X11	♂	30	PT	4M	4M	92	Consultant and developer
X12	♂	25	PT	1Y	4M	80	Developer
X13	♂	35	PT	7Y6M	7Y6M	52	IT Service Manager - Global Complaint & Customer satisfaction Manager
X14	♂	41	PT	16Y	6Y	88	IT System Architect
X15	♂	27	PT	4Y	3M	52	Data Engineer
X16	♂	31	UK	16Y	13Y	96	Developer ServiceNow

X17	♂	44	PT	20Y	2Y	60	Service Manager
X18	♂	37	PT	12Y	2Y	51	Service Integration Manager
X19	♂	40	PT	13Y	1Y	97	IT Technician, Developer
X20	♂	36	PT	14Y	2Y6M	69	IT Development Professional - Applications
X21	♀	25	PT	2Y	3W	80	Trainee Product Owner
X22	♂	24	PT	3M	3M	55	Trainee OutSystems
X23	♂	42	PT, DE	20y	9Y	72	IT Service Manager
X24	♀	25	PT	2Y	3M	57	Marketing assistant (law business research)
X25	♀	27	PT	4Y	2Y	84	IT Developer
X26	♂	31	PT	8Y	5Y	49	Sub Chapter Lead (Team Leader)
X27	♂	41	PT	15Y	6Y	99	Solution Architect
X28	♀	25	PT	7Y	4M	57	Clinical psychologist and office management
X29	♂	25	PT	1M	1M	69	Developer (Debugging, unit tester)
X30	♂	24	PT	1Y8M	4M	147	Full Stack Developer
X31	♂	27	PT	3Y	4M	57	Self-employed, service provider to tutoring centers, musician

X32	♂	27	CV, PT	2Y	5M	50	Technical Tests
X33	♀	24	PT	3Y	3Y	92	Developer
X34	♀	47	PT	19Y	13Y	52	Project Manager
X35	♂	34	PT	12Y	4Y6M	65	Team Leader and Architect
X36	♂	27	PT	5Y	4M	103	IT Consultant, Developer
X37	♀	25	PT	2Y	3M	106	Product Owner
X38	♂	23	PT	5Y	1Y	84	Disruptive Technologies Consultant, developer
X39	♂	26	PT	3Y	4M	75	Developer
X40	♂	27	PT	4Y	2Y	55	SalesForce Developer (Software Dev)
X41	♂	26	PT	5Y	1Y6M	105	Developer back-End
X42	♂	23	PT	5Y	1Y	102	Assistant Consultant, Blockchain Analyst, Developer
X43	♂	29	PT	2Y	1Y3M	112	Developer
X44	♂	23	PT	2Y	1Y	64	Developer JavaScript
X45	♂	42	PT	10Y	2Y	145	Software Developer, Servicenow Developer
X46	♂	28	PT	5Y	2Y	43	Assistant Consultant, Mobile App developer
X47	♂	30	PT	9Y	2Y	139	Product Owner, Change Manager and Team lead of Architecture

X48	♂	**24**	**UA**	**5Y**	**3Y**	**77**	**Leading 2nd level support team, System Administrator (service administrator)**
X49	♀	**37**	**PT**	**15Y**	**3Y6M**	**86**	**It Project manager, sub chapter head (line manager) of Project Management, Incompany manager of Project Management Horizontal IT**
X50	♀	**24**	**PT**	**4Y**	**1M**	**40**	**Tax Consultant Trainee**
X51	♀	**24**	**PT**	**2Y6M**	**4M**	**164**	**Staff 2 (tax consultancy level 2)**
X52	♀	**28**	**PT**	**5Y**	**1Y6M**	**89**	**Project Management Officer, scrum master, work stream leader (waterfall model)**
X53	♀	**30**	**PT**	**10Y**	**1Y1M**	**122**	**Project Manager/Project Manager Officer**
X54	♀	**24**	**PT**	**7M**	**1M**	**80**	**Kindergarten teacher**
X55	♂	**39**	**PT**	**18Y**	**6Y**	**123**	**IT Operations Professional, Infrastructure, System Administrator**

X56	♂	40	PT	16Y	1Y	127	Service Integration Manager
X57	♂	24	PT	3Y	3Y	68	SAP Consultant
X58	♂	24	PT	2Y6M	1M	59	Analyst
X59	♂	25	PT	3Y	3M	92	Software engineer
X60	♂	26	PT	9M	5M	73	Computer networks technician trainee
X61	♂	25	PT	7M	1M	90	Junior Consultant
X62	♂	23	PT	7M	1M	34	IT Technician
X63	♂	28	PT	6Y	5Y6M	68	Team Leader
X64	♂	24	CV	1Y6M	1Y	99	Application developer service now
X65	♀	37	PL, PT	16Y	8Y	40	IT Project manager
X66	♀	43	PT, FL	10Y	4Y	74	Customer Satisfaction and Complaint Manager
X67	♀	25	PT	1Y6M	5M	64	Lawyer
X68	♀	42	PT	20Y	15Y	126	IT team leader
X69	♀	41	PT	15Y	12Y	148	Service Integration Manager
X70	♂	37	PT	13Y	4Y6M	74	Manager, Security Operations Center Chapter Lead
X71	♂	34	PT	10Y	6Y	71	Chief Financial Officer
X72	♂	40	PT, LU	15Y	10Y	93	IT Solution Expert
X73	♂	25	PT	4Y	4M	58	Reception Manager
X74	♀	24	PT	8M	4M	107	Analyst
X75	♀	25	PT	2Y6M	2Y6M	93	Developer
X76	♀	24	PT	1Y	4M	112	Internal communication manager
X77	♂	24	PT	4Y	1Y6M	103	Financial Analyst

X78	♀	25	PT	2Y10M	2Y10M	81	Company public relations
X79	♂	43	PT	20Y	7Y	66	Operations Developer
X80	♂	40	PT	17Y	4Y	77	IT Service Manager
X81	♂	38	PT	17Y	3Y	62	Team Leader, Chapter Lead
X82	♂	49	PT	35Y	15Y	55	IT professional, portfolio Manager (strategy)
X83	♂	33	PT	11Y	3Y	44	Project Manager
X84	♂	36	PT	12Y	1M	77	Project Manager Officer, Functional Analyst
X85	♂	25	PT	4Y	2Y1M	87	Software Developer
X86	♀	44	PT	18Y	6Y6M	59	Project Manager
X87	♀	27	PT	3Y	3Y	98	Department Environment health and safety staff
X88	♀	26	PT	6Y	6M	58	Communication Manager
X89	♀	44	PT	23Y	8Y6M	76	Test Center Manager
X90	♂	43	ZA	22Y	11Y	64	IT Service Management Professional - Infrastructure , IT solution expert
X91	♂	31	PT	14Y	8Y	68	Developer
X92	♂	34	PT	11Y	2Y	99	Service Manager
X93	♂	25	PT	10M	4M	74	Risk advisory Analyst
X94	♂	26	PT	1Y2M	1Y2M	109	Developer

X95	♂	32	PT	4Y	4Y	103	IT Application, solution expert
X96	♂	33	PT	8Y	8Y	92	Co-founder Chief of operations (also project management)
X97	♂	25	PT	1Y4M	3M	63	Junior Advisor
X98	♂	29	BR	12Y	5Y	84	Service Now Developer
X99	♂	25	PT	3Y	4M	65	Computer technician
X100	♂	26	PT	3Y	2Y6M	69	Developer
X101	♂	33	PT	10Y	2Y	104	Product Leader
X102	♂	34	PT	9Y	8M	78	Consultant, Tester
X103	♂	40	PT	15Y	6Y	71	IT Team Leader, Incountry manager Value Center Core, Network engineer
X104	♀	24	PT	3Y	1Y6M	101	Developer Specialist administrator
X105	♀	29	PT	8Y	3Y	99	Release Manager
X106	♂	24	PT	1Y3M	7M	54	Developer
X107	♂	25	PT	2Y4M	8M	83	Financial Analyst
X108	♂	36	PT	14Y	2Y	95	Specialist level 3
X109	♂	28	BR	10Y	5Y	69	Developer

Attachment E- Interviewees Position/Role

Table A3 - Interviewees Position/Role

Role	Count
Developer	12
IT Service Manager	4
Project Manager	3
Service Integration Manager	3
Service Manager	3
Product Owner	2
Financial analyst	2
Analyst	2
Developer Service Now	2
Junior Consultant	2
Software Developer	2
Lawyer	1
Kindergarten teacher	1
Staff 2 (tax consultancy level 2)	1
Marketing assistant (law business research)	1
Company public relations	1
Risk advisory Analyst	1
Application developer service now	1
IT Consultant, Developer	1
Developer (Debugging, unit testing)	1
Developer back-End	1
Developer Specialist administrator	1
IT Developer	1
IT Development Professional - Applications	1
Operations Developer	1
Project Manager Officer/Functional Analyst	1
Product Owner, Change Manager and Team leader of Architecture	1
SalesForce Developer (Software Developer)	1
Software Developer Service Now Developer	1
Sub Chapter Lead (Team Leader)	1
Team Leader	1
Team Leader and Architect	1
Computer technician	1
Computer networks technician trainee	1
Chief finance officer	1
Department Environment health and safety staff1	1
Assistant Consultant, Blockchain Analyst, Developer	1

Assistant Consultant, Mobile Applications developer	1
Technology technician, Developer	1
Co-founder and Chief operating officer	1
Communication Manager	1
External Consultant, Tester	1
Consultant .net developer	1
Data Engineer	1
Data Scientist Trainee	1
Developer JavaScript	1
Disruptive Technologies Consultant, developer	1
External, Analyst, Developer, Tester	1
Full Stack Developer	1
Internal communication manager	1
IT Application solution expert	1
IT Operations Professional, Infrastructure, System Administrator	1
IT professional, portfolio Manager (strategy)	1
IT Project manager	1
IT Project manager, sub chapter head (line manager) of Project Management and in company manager of Project Management Horizontal IT	1
IT Service Management Professional - Infrastructure, IT solution expert	1
IT Solution Expert	1
IT System Architects	1
IT Team leader	1
IT Team Leader, In- country manager Value Center Core, Network engineer	1
Junior Advisor	1
Leading 2nd level support team, Sys Admin (service admin)	1
Manager, SOC Chapter Lead	1
Product Leader	1
Product Owner	1
Project Management Officer	1
Project Management Officer, Scrum master, Work stream leader (waterfall model)	1
Project Manager/Project Manager Officer	1
Clinical psychologist and office management	1
Reception Manager	1
Release Manager	1
SAP Consultant	1
Software engineer	1
Software Tester	1
Solution Architect	1
Specialist level 3	1
Team Leader of planning controlling e reporting	1

Team Leader, Chapter Lead	1
IT Technician	1
Test Center Manager	1
Self-employed, service provider to tutoring centers, musician	1
Fiscal consultant	1
Trainee OutSystems	1
Total	109