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E-mails, home office, and Skype conferences: how can online communication and telecommuting be a substitute to traffic?

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Abstract

Taking into consideration environmental and traffic issues, the present thesis investigates strategies to stimulate the practice of telecommuting and to focus on online communication within organizations, since such practices have shown to be extremely beneficial when decreasing gas emissions and traffic congestion.

To understand how online communication can be a substitute for mobility in the work environment, different leaders from 10 companies were interviewed about the telework practice. The findings demonstrate that telecommuting's appearance is still very shy in organizations, and it is mostly applied only when needed, meaning that it is not strategically adopted by employers. Furthermore, a need for regulation and trainings was revealed by the participants, as well as a lack of political efforts by governmental offices.

Unter Berücksichtigung der Umwelt-und Verkehrsfragen untersucht die vorliegende Arbeit Strategien, wie in der Praxis Telearbeit besonders mithilfe von Online-Kommunikation in Organisationen gefördert werden kann. Derartige Telearbeitsmassnahmen haben sich als äußerst nützlich erwiesen, um Emissionen und Stau zu reduzieren.

Um zu verstehen, wie Online-Kommunikation die Mobilität in der Arbeitswelt ersetzen kann, wurden verschiedene Führungskräfte aus 10 Unternehmen zur Telearbeit in ihrem Unternehmen befragt. Die Ergebnisse zeigen, dass Telearbeit immer noch sehr zaghaft in Organisationen angewendet wird, und die Praxis erst dann angewendet wird, wenn erforderlich. Das heißt, dass sie nicht strategisch von den Arbeitgebern übernommen wird. Die Ergebnisse zeigen einerseits, dass laut sich die Befragten für Telearbeit Regelungen und Schulungen wünschen, andererseits bestehe ein Mangel an politischen Bemühungen von Regierungsstellen diese Maßnahmen zu unterstützen.

Summary

1	Introduction.....	1
1.1	Relevance	2
1.2	Chapters Overview	3
2	Literature Review	5
2.1	Definitions	5
2.2	Theoretical Framework	6
2.2.1	Media Richness Theory	6
2.2.2	Organizations Prone to Adopt Telecommuting	7
2.3	State of Research.....	8
2.3.1	Teleworking Impacts on Employees	9
2.3.2	Technology Issues.....	15
2.3.3	Communication Versus Traffic.....	17
2.3.4	How is Traffic Reduction Interesting for Organizations?	18
2.3.5	Political Decisions that can Foster the Adoption of Telecommuting within Organizations.....	22
2.3.6	Reasoning the State of Research on the Field of Telecommuting.....	23
2.4	Research Questions	24
3	Methodology	27
3.1	Research Design	27
3.2	Guideline	27
3.3	Semi-structured Interviews	29
3.4	Sample Selection	30
3.5	Data Analysis	31
3.6	Trustworthiness, Rigor and Quality.....	32
4	Results.....	34
4.1	Research participants: a brief introduction to their profile	34
4.1.1	Brazilian interviewees	34
4.1.2	German interviewees.....	36
4.2	How can online communication be a substitute for mobility in organizations?.....	36
4.2.1	The Usual Applications of Telecommuting within Companies	36
4.2.1.1	Frequency of Telecommuting	37
4.2.1.2	Number of Telecommuters	37

4.2.1.3	Best Fitting Situations for Telecommuting.....	37
4.2.1.4	Types of Telecommuting	38
4.2.1.5	Criteria of Selection of Telecommuters	38
4.2.2	Situations when Telecommuting cannot/should not be Applied.....	39
4.2.3	Online Communication actually fostering mobility	40
4.2.4	Aims, Advantages and Achievements of Telecommuting	41
4.2.4.1	The Aims of Telecommuting	41
4.2.4.2	The Greatest Advantages of Telecommuting	42
4.2.4.3	Organizations' Achievements Brought by Telecommuting	44
4.2.5	The Biggest Challenges of Telecommuting within Organizations.....	45
4.2.5.1	Obstacles of Telecommuting within Organizations.....	45
4.2.5.2	What is missing, when telecommuting is concerned?	46
4.2.5.3	Problems and Disadvantages of Telecommuting	46
4.2.6	Organizational Strategies and Efforts Directed to Telecommuting	47
4.2.7	The Technological Side of Telecommuting.....	48
4.2.8	Political Decisions to Foster Telecommuting.....	50
4.2.8.1	Existent Political Decisions Regarding Telecommuting	50
4.2.8.2	Political Decisions to Stimulate Telecommuting in the Future	51
4.2.8.3	Would Political Decisions be a Strong Factor for the Adoption of Telecommuting?	51
5	Discussion	53
5.1	Suggestions and recommendations	65
5.2	Issues and Limitations	66
5.3	Further Research	66
6	References	68
7	Appendices	I
7.1	Interview Guideline in English.....	I
7.2	Interview	IV
8	Declaration of Autonomy	XIV

List of Tables

Tabel 1. Private, Public and Individual Costs and Benefits Associated with Telecommuting (Shafizadeh et. al., 1998)..... 19

Tabel 2. Interviewees and Their Respective Interview and Company’s Information..... 31

List of Figures

Figure 1 Management Disciplines and Telecommuting Issues (Siha and Monroe, 2006)	9
Figure 2. Interaction between telecommuting adoption process (Yen and Mahmassani, 1997).....	11
Figure 3. Formulation of interactions between telecommuting (Yen and Mahmassani, 1997)	12
Figure 4. Telecommuting Scheme for Guideline	26

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1 Introduction

It is predicted that by 2016, telecommuters will total 3.9 million people. Regular telecommuting has increased by 79% between 2005 and 2012 (“Global Workplace Analytics,” 2013). While the initial interest in telecommuting came from traffic congestion, nowadays organizations have shown to have different reasons for sending their employees to work at home and customize themselves to web conferencing, among other practices. Telecommuting has shown to boost productivity, bring life improvements to employees, decrease expenses in organizations and diminish traffic congestion and pollution. Still, how online communication and teleworking can replace traffic, remains a question.

Evidently, the emergence of electronic tools and online communication technologies has brought about many changes in the past decades, with organizations being in the spotlight. People were already starting to telework since the 1970s, when it was applied as a strategy to save energy and decrease traffic time (Avery and Zabel, 2001), yet this practice was able to grow immensely with technology expansion and the internet. It is also remarkable and a subject of studies, how teleworking affects society by reducing the traffic and bringing improvements to big cities when public transportation is concerned. Additionally, it has been empirically demonstrated that the practice helps reducing gas emissions and pollution, which bring an even higher relevance for the topic.

Therefore, the present study aims to understand different aspects of telecommuting applying the research question “*How can online communication and telecommuting be a substitute to traffic in organizations?*”, through a qualitative method, in order to provide depth for the information. The answers to this research question are reached through the understanding of the practice of teleworking in organizations, the advantages, the obstacles, the technological point of view and finally, the political decisions that influence the decision of instituting telecommuting in an organization. In order to accomplish the research, managers and coordinators from different companies are interviewed. As previously mentioned the method is qualitative and involves a semi-structured guideline, which is utilized with 10 employers from organizations from different industries, such as advertising agencies, an educational institution and different retailers. As a focus on a specific region was not a strong factor for the method, the companies that participated are localized in Brazil and Germany. Posteriorly, a thematic analysis is applied on the transcriptions’

content, and the findings are then withdrawn from the interviews, in order to finally answer the research question.

The relevance of this study can be shown by the importance to stimulate telecommuting and focus on online communication, as it brings diverse improvements for society and the environment. Furthermore, employers will be investigated because they are the big deciders when telecommuting is to be adopted in an organization, and they might be able to learn from its findings, which will also offer better view on how telecommuting can be more beneficial considering organizational interests and point of view. Governmental offices will also be given the opportunity, with this study, to understand different manners to stimulate the adoption of telecommuting, since governmental telecommuting incentives to companies are also investigated among the employers.

1.1 Relevance

As a starting point, it is important to highlight the many benefits of a focus on online communication and telecommuting instead of traffic and mobility. Studies have empirically shown the positive implications for the environment through the reduction of Vehicle Miles Traveled (Kitamura, Mokhtarian, Pendyala and Goulias, 1991), which consequently decreased substantial emissions reductions, such as organic gases, monoxide, nitrogen oxides and particulate matter (Koenig, Brett, Henderson, and Mokhtarian, 1996). The reduction of traffic jam is also highly procured to increase the life quality within society. When such aspect is concerned, the practice of telecommuting has also demonstrated to decrease congestion between 6.9 and 10.9% in Tokyo (Mitomo and Jitsuyumi, 1999), as an example.

Facing such important benefits of telecommuting, the need to stimulate the practice becomes latent. And, since organizations are the ones who decide to adopt such a model of work, it is essential to help companies' leaders to gain more in-depth understanding about the employment of telecommuting in organizations and its benefits, as well as having a better overview of the situations where teleworking are better applied, from their own perspective. Such results might serve for the improvement of the telecommuting sphere, the comprehension of which situations teleworking functions are optimal and to realize its impacts on traffic. Therefore, the research will provide information about the relationship between organizational communication and mobility.

The influence of political decisions on organizations when telecommuting is concerned is also approached here, i.e. are there any actions from politicians on stimulating companies to apply teleworking, and until what point this is a decisive factor for organizations to invest on mobile

work. The findings can offer governmental offices the understanding of what is needed in order to incentive telecommuting within companies, and which governmental stimuli that organizations are interested in and would profit of, as the participants of this thesis will also be questioned regarding such issues.

Additionally, although there are many studies approaching the topic, there is actually a need for research which is focused on revising inputs and decreasing the need for assumptions and theoretical scenarios, besides having a focus on the problems being addressed by telecommuters and their managers (Shafizadeh, Mokhitarian, Niemeier and Salomon, 2000), which will be here presented.

In a nutshell, the main idea behind the present research is to understand how telecommuting can replace traffic within organizations, with the final goal to create a set of findings that might help to stimulate the practice and finally to bring improvements to the environment, society and traffic issues.

1.2 Chapters Overview

The first chapter of the thesis presents a review that summarizes findings of the literature on the field, such as the definitions of telecommuting, the theoretical framework and the current state of research, which focuses on the impact of the practice on society, employee and employers. The chapter also approaches the previous literature about the influences of technology on telecommuting, the cost benefits for companies and employees and the traffic reduction that the practice offers. Furthermore, it addresses strong factors on the adoption of mobile working and a brief research overview on political decisions that were accomplished in order to stimulate teleworking in organizations. In the end of this part, the research questions are also introduced.

The following chapter has a focus on methodology. It contains a description of the research design, along with a brief presentation of the guideline, a part discussing the sample selection, the description of the data analysis method and finally, an approach to validity and reliability on qualitative research.

The fourth and main chapter consists of the results of this present research, and it starts with brief paragraphs about each interviewee that participated in this research. Posteriorly, it exhibits a summary of findings that were withdrawn from the transcriptions, along with brief discussions about the issues that are identified on each interview.

The fifth chapter presents a final discussion concerning the findings and the question “*How can telecommuting be a substitute for traffic in organizations?*” along with some recommendations for the practice of telecommuting. In this chapter, limitations and issues that came up during the study are also expressed, besides the presentation of recommendations for future research on the field.

2 Literature Review

2.1 Definitions

The term “telecommuting” stemmed from Jack Nilles’ incident of being stuck in a traffic jam in Los Angeles. According to Fitzer (1997, p. 65), the definition of telecommuting is “work arrangement in which employees perform their regular work at a site other than the ordinary workplace, supported by technological connections”. As also stated by Nilles (1975), the combination of high gasoline prices and new capabilities for data communication created the initial ideas about telecommuting in the decade of 1970.

Telecommuting, teleworking, virtual work or mobile work can be performed during a few days a week, or on a permanent basis. Three main components of telecommuting can be identified: utilization of information technology (IT), link with an organization and delocalization of work (Johnson, 2001). The first component is essential to telecommuting, as it basically depends on the processing, manipulation and transformation of information. Therefore, information technology is the key that allows workers to be in constant communication with the organization and their colleagues. Secondly, as opposed to independent workers, telecommuters still have a tie with the organization. Lastly, telecommuting does not limit location. Therefore, the delocalization of work may happen in these forms: home-based telecommuting, satellite offices, neighborhood work centers and mobile work. Timely telecommuting (i.e. Video Conferences) is also considered within this thesis, as it also decreases traffic and mobility. In this case, the employee could still be working at the company office, but he or she would avoid relocating in order to be physically present at another location for a meeting with external working parts, such as clients, employees from other branches or suppliers.

Besides the timely utilization of teleworking tools, in accordance to Nilles (1994), mobile work can come in different shapes: Home-based telecommuting happens in the worker’s residence. Satellite offices are basically small organizational affiliates that are located close to residential areas where a telecommunications link with headquarters is permanently conserved. Neighborhood work centers are spaces where telecommunication tools are enabled for the workers, and it is usually shared by employees from different firms. Finally, mobile work is a type of telecommuting that does not possess a specific location, and it enables telecommuters to perform their work in different places (Nilles, 1994). Since the present thesis has a focus in understanding how online

communication can substitute mobility, such concepts will be applied together with other online communication practices, i.e. tools that allow employees to communicate online, whereas normally they would need to dislocate to other places.

2.2 Theoretical Framework

It is safe to say that most studies in the field of telecommuting are based either on descriptive cases or statistical research involving specific telework practices and organizational outcomes (Belanger and Collins, 1998). As it can be viewed within the State of Research section, such studies support a deeper comprehension on the practice of telecommuting within organizations; nevertheless, many of these studies have been hindered because of the absence of an applicable theoretical base (Bailey and Kurland 2002; Cave, 2000; McCloskey and Igbaria, 1998). Additionally, existent theories and models that approach telecommuting have a focus in the telecommuter's point of view (Brown, 2010), whereas only few studies focus in perspectives from other parts. Hence, even though the theories presented within this section can be connected and utilized in the present study, it is important to be aware about the lack of theories when telecommuting within organizations is concerned.

2.2.1 Media Richness Theory

Telecommuting and online communication provide many benefits to organizations, however, there is a challenge when substituting personal and face-to-face meetings, since a virtual presence can defy communication efficacy and decrease interpersonal communication opportunities (Duxbury and Neufeld, 1999; Ramsower, 1985).

The Media Richness Theory basically brings up the fact that technology is not elevated enough to be able to reproduce the same effects of face-to-face communication within an office environment (Daft & Lengel, 1984). In accordance to this theory, there are some aspects of interactions that can only be taken advantage of during a face-to-face conversation, such as the clarification of ambiguous issues, the expression of immediate feedback, besides personalized communication (such as body language). As this thesis has a focus in the usage of online communication and telecommuting, such theory might provide the assumption that such aspect can be an obstacle of mobile work, and perhaps also the reason behind the non-adoption of the practice. Nevertheless, it is important to keep in mind that the theory was formulated in 1984, and perchance, with technological advances, such online communication tools existent nowadays might bring a high quality level to telecommuting interactions. As an example, in an article produced by Kock

(2005), the scholar mentions different hypotheses pro and contra Media Richness Theory, which leads him to conclude that, with the advance of technology, telecommuting tends to achieve very high naturalness.

2.2.2 Organizations Prone to Adopt Telecommuting

There are a number of factors that have to be taken into account when researching telecommuting in firms. In order to have a deep understanding on how communication can substitute traffic in organizations, it is crucial to comprehend the possible differences between companies that might affect the outcome of this study. In a study made by Mayo, Pastor, Gomez-Mejia and Cruz (2009), a number of characteristics are considered when understanding why some firms adopt telecommuting. There are two main characteristics that might influence this research: company size and company internationalization.

Company Size

As literature suggests, smaller companies are more likely to pursue innovations on the HR field, first because they tend to substitute high salaries with other benefits, as the authors mention. Secondly, it happens less often that an employee's low performance is undetected in smaller firms. Lastly, "from a cultural perspective, small companies tend to experience less organizational inertia and develop a more entrepreneurial spirit".

Company Internationalization

The scholars also demonstrate in the theoretical framework, that when companies have many international employees, telecommuting can overcome the geographical limitations by organizing the activities with information technology. In this situation, communication allows flexibility and the reduction of costs (e.g., Davenport & Pearlson, 1998).

Such theories were applied to hypotheses that were tested in the study of Mayo et. al. (2009). When testing the hypothesis "the greater the size of a company, the less likely it will offer telecommuting to its employees", the results showed that there was a support for this hypothesis. As the scholars explain, smaller companies are less bureaucratized and are more opened to adopt the practice of telecommuting as it brings financial benefits, besides being consistent with their entrepreneurial culture.. Furthermore, the hypothesis "The greater the proportion of international employees, the more likely the organization will offer telecommuting to its employees" was also confirmed, as organizations pursue to adopt such organizational practices when aiming to overcome employees' constraints.

2.3 State of Research

Since the emergence of telecommuting, a significant amount of scholars began to develop studies on the theme. These studies feature a variety of approaches and focuses; however they still require further research on the field. Once again there is a need to highlight the lack of theories within the field of telecommuting, as the studies in this chapter mostly do not take advantage of a theoretical background.

A very broad and useful guide about telecommuting is from Nilles himself (1998). The book, called “Managing Telework”, gives a good overview about issues to be taken into account when applying teleworking to a firm, such as the concept of teleworking and its advantages, how to select teleworkers, how to decide a work site for the teleworker, technology aspects, teleworkers management and the rules and regulations. On the topic of selecting teleworkers, for example, Nilles prepared a table with tasks that might be more suitable for teleworking and the ones that are not suitable, mostly for needing face-to-face interactions. On the chapter about the teleworker management, Nilles emphasizes the importance of trust between the manager and employee, and the value of communication between them. He mentions also how essential it is to focus on the product instead of the process, when managing a telecommuter. This book was highly recommended and cited by other researchers on telecommuting, considering Nilles one of the most well known researchers in the field.

Such early literature has given space for other focuses and studies. When observing the research on teleworking, it is possible to affirm that they are mostly divided into four main topics: the implications for employees, technology aspects, benefits for the environment and finally the implications for the organizations and employers. In the following image, it is possible to see these topics with their management disciplines.

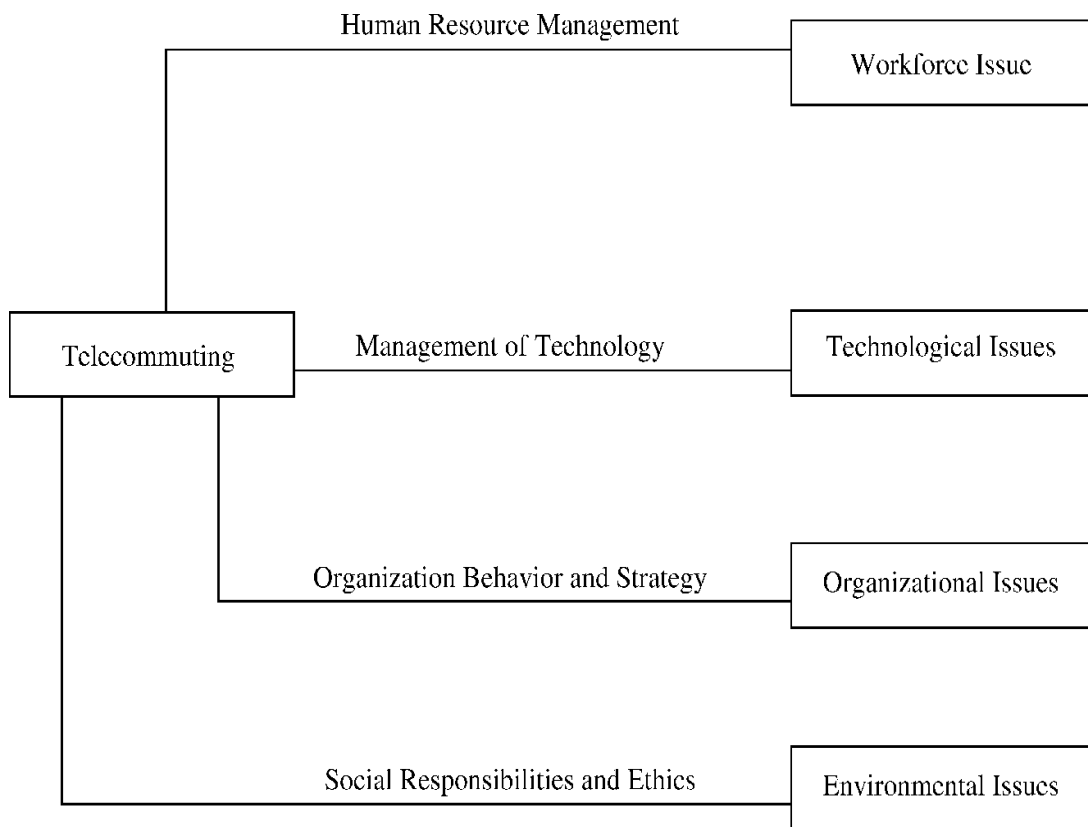


Figure 1 Management Disciplines and Telecommuting Issues (Siha and Monroe, 2006)

2.3.1 Teleworking Impacts on Employees

As previously said, many studies aim to understand the implications that telecommuting brings to the employees, such as psychological effects or the interactions between the co-workers, besides benefits brought to employees which affect the organization (Golden, 2007; Cooper and Kurland, 2002; Rogers and Allbritton, 1995; Bordia, 1997; Mühlfelder, Klein, Simon and Luczak, 1999; Santra and Giri, 2009). Research within this topic will be here presented, however, it is important to clarify that most of them do not utilize a theoretical framework, since, as previously discussed, there is a lack of theories in the field of telecommuting research. Additionally, because the impacts on telecommuters are not the main focus of this thesis, only a brief overview will be exhibited.

Yen and Mahmassani (1997) presented a conceptual framework that focuses on the adoption of telecommuting by both companies and employees. Within this conceptual framework, the scholars explain the adoption of telecommuting and its environment, and the whole process is a result of employee and employer decisions, which is induced by four environmental factors: (a) telecommunications technologies, (b) transportation systems performance, (c) public policies and

(d) land use patterns. As the consequences of virtual work adoption usually influences modifications in the travel behavior of teleworkers, other aspects that affect the environmental factors were also included, such as household activity allocation, car ownership decisions, along with location choices of residences and companies. This structure is explored in the Figure 2, and it demonstrates a modular framework focused in modeling the complex interactions between telecommuting adoption and its environment. Here, the following components are included: activity system, transportation system, and land use pattern. The telecommuting adoption occurs through employee and employer adoption, and its impact consists of three different levels: telecommuting effects on the environment, which are short-term, medium-term, and long-term. As described by Yen and Mahmassani,

“The scheme assumes that travel demand comes from the need or desire to participate in activities at the destination, as highlighted by the strong interaction among the transportation system, the activity system, and the land use pattern. Traditional travel-demand modeling procedures are not readily applicable to analyze the potential impacts of telecommuting. As such, telecommuting can be added to the list of ongoing policy concerns such as air quality, congestion management, and advanced technologies that are motivating renewed interest in alternative transportation planning methodologies. Activity-based approaches are particularly appropriate to analyze the transportation impacts of telecommunications technology applications. Their basic premise is that the activities (motivated demand and final goods) instead of trips (derived demand) should be at the center of demand-analysis procedures (3,4). Telecommunications can directly and indirectly influence activity patterns as they have the potential to transform the movement of people and goods on transportation networks by information transmission on telecommunications networks.”

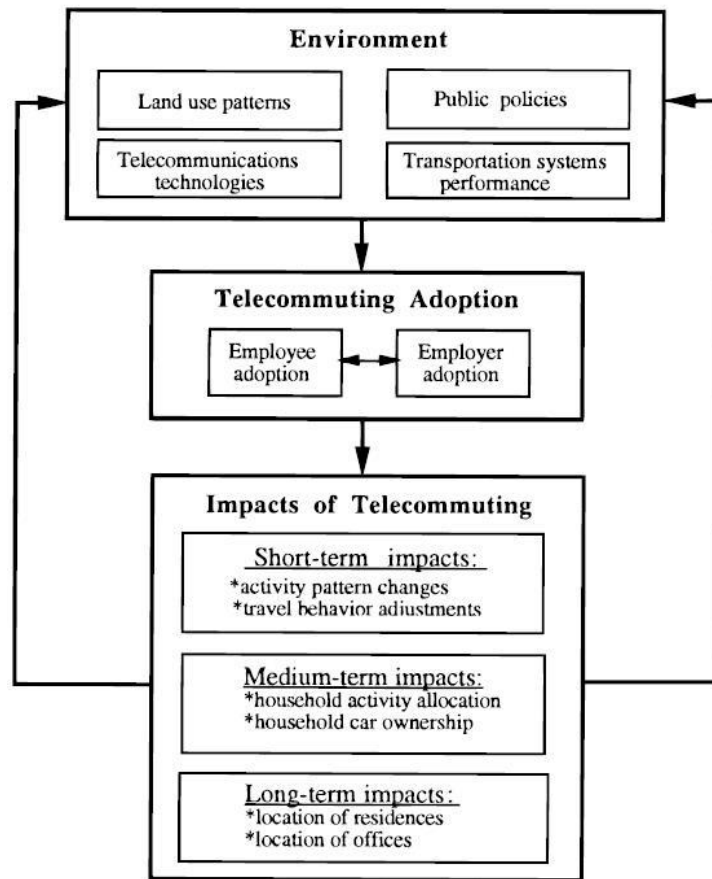


Figure 2. Interaction between telecommuting adoption process (Yen and Mahmassani, 1997)

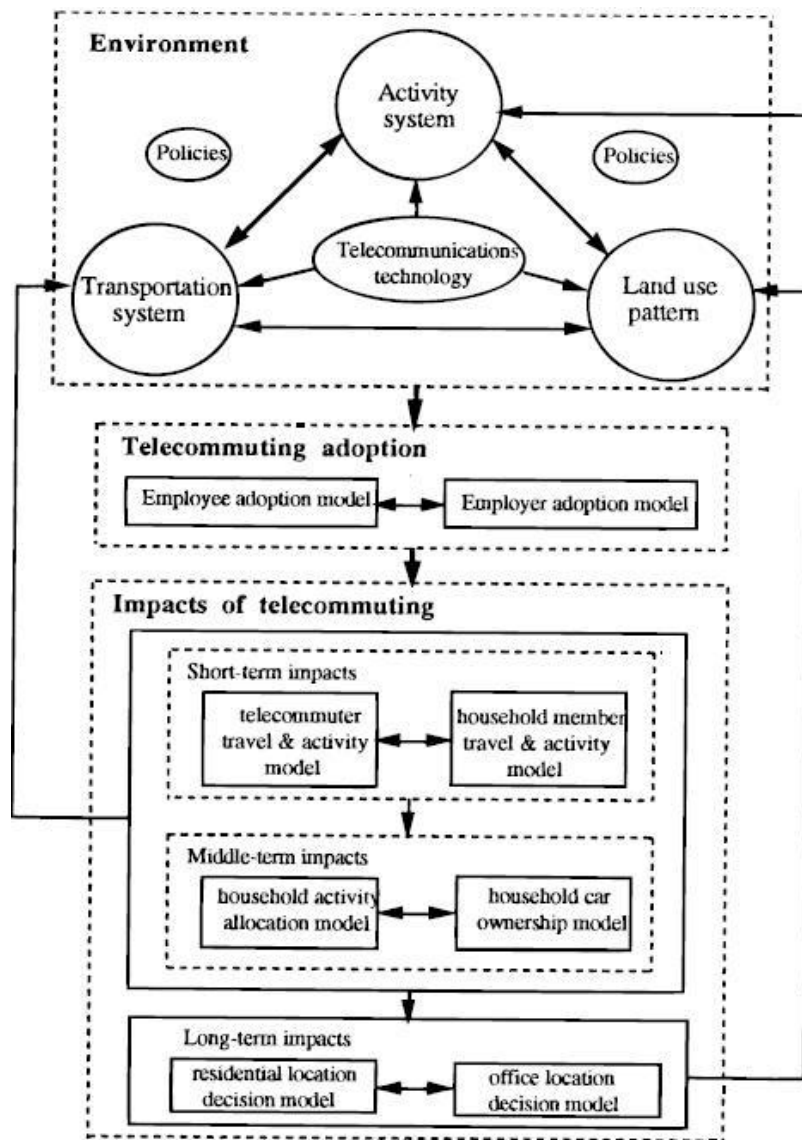


Figure 3. Formulation of interactions between telecommuting (Yen and Mahmassani, 1997)

As previously mentioned, the telecommuting adoption process has two different perspectives; the employee's and the employer's perspective. The process from the employer's side usually is influenced by factors such as management style, inclinations to adopt new policies, perception about the practice, business type, among others.

After the establishment of such framework and concepts, the scholars applied them to surveys performed with employees, assuming that they would demonstrate a significant desire to telecommute. The research brought to knowledge that the employees' participation in telecommuting is influenced by factors such as economic implications, personal and household characteristics, job characteristics, commuting trip attributes and attitudes towards telecommuting (Yen and Mahmassani, 1997). Nevertheless, as the authors also mention, a need for the application

of this model focusing in the employer's decision to adopt telecommuting is also necessary, as this study focused only in the employees' perspective.

The benefits of mobile work for employees were also highly studied, which show to stem from psychological benefits such as less stress and more quality time with oneself or family; productivity and flexibility advantages; and financial benefits. Research also demonstrated disadvantages when topics like isolation, lack of communication and less work promotion opportunities are concerned.

When the advantageous factors are the focus, employees that adopted telecommuting profit from working at home or at a work center in situations such as relocation (both of home or work) and travel stress, as pointed out in a quantitative study by Mokhtarian and Salomon (1997), in which employees from companies in San Diego were interviewed about the possibility, preference and choice of telecommuting. Another benefit is the ability to reconcile the employee's personal life with work, since telecommuting gives people more freedom to manage their time between work, leisure time and family responsibilities (Reinsch, 1997). Increased flexibility was also highly mentioned in research conducted by Knight and Westbrook (1999), as being one of the most motivational reasons to telecommute. It also seems to be the cause of higher levels of productivity, as the employee tends to work when their creativity is high, which might happen not only during the fixed work time in the company (Richter and Meshulam, 1993).

Furthermore, telecommuting decreases the number of distractions that usually appears in the office (Nilles, 1994) and teleworkers have also gained positive results when costs are concerned. According to Nilles (1994) and Horner (2011), teleworkers save on commute-related expenses (gas, tolls, parking, clothing and other costs).

On the other hand, Cooper and Kurland (2002) have pointed out isolation concerns of teleworkers, such as interpersonal networking, informal learning and mentoring, in a qualitative study with public and private organizations, in which teleworkers, non-teleworkers and their supervisors were interviewed. The results show that professional isolation is directly associated to the employee's development, meaning that, when teleworkers miss out on one of the developments activities that normally occur at the workplace, they did not have the same degree of access to these informal developments opportunities. The scholars also concluded that private organizations usually appeared to be more worried about their employees missing employment opportunities than public organizations did, nevertheless, in any type of organization the employees' potential were

undermined due to their isolation. These findings affect organizations directly, as they can be an obstacle for using online communication instead of mobility in companies.

In another study, Bailey and Kurland (1999) listed the advantages and challenges of telework from an organizational point of view, as well as from the personal and societal points of view. The research, which is extremely relevant and respected on the field, highlights many different points that relate to productivity, morale, monitoring, and informal interactions among others. Many of these points demonstrate the limitations of telecommuting and the need for a clearer path, which would allow companies to understand which situations might work in such way that online communication might be a substitute for mobility, and which ones, might not work.

Moreover, the quantitative study accomplished by Golden (2007) presented other challenges of telecommuting from the co-workers point of view, whom are not teleworking. In the study, the scholar explains how non-teleworker's work is affected when others are teleworking. As predicted, the higher prevalence of teleworkers was discovered to be negatively connected with the satisfaction from co-workers, implying therefore, that telework by others in the office might adversely cause an impact on how non-teleworkers view their co-workers. This satisfaction with co-workers was also found to be related to turnover intentions, which could directly affect the company. Another issue would be the perception of justice, since co-workers of teleworkers might have less flexibility and sometimes a larger amount of work, when having to execute minor tasks for those that are not in the office. Moreover, the absence of some in the office might cause decrements in socio-emotional bonding between the co-workers. Some of these challenges are remarkable for this research, as they can provide clues to what can stop mobility being replaced by online communication in organizations (e.g. work activities by others in the office are altered by teleworkers' absence).

In a research performed by Shafizadeh et. al. (2000), a range of cost benefits for employees are presented. The quantitative study shows that cost benefits are most advantageous when the trip to the work place is long, the travel time is highly valued, and when the employer is responsible for the equipment costs. Also, cost benefits are not likely to exceed expenses if the employee is responsible for the equipment costs.

Furthermore, telecommuting may have other negative impacts on employees, such as isolation problems (as mentioned before), less chance of being promoted and having tendencies to overwork. Fitzer (1997) affirms that feelings of isolation and the loss of morale are the most

common and cited negative impacts of teleworking. The practice can also become negative when the employee has family distractions at home, which decreases the level of productivity (Mogelonsky, 1995). Moreover, teleworkers often suffer from the lack of organizational support (Dixon and Webster, 1998).

2.3.2 Technology Issues

The second type of research on the field has a more technological perspective, concentrating on communication tools and networks that make teleworking happen (Rogers and Allbritton, 1995; Kraut and Attewell, 1996; Dewett and Jones, 2001). Among the many advantages that investing in technology brings, it has been studied, for example, how technology permits the company to use the information system in a more efficient manner, especially during non-office hours, besides offering the firm the possibility of a better usage of information systems (Gordon and Kelly 1986, Hamilton 1987). The topic of technology is important to this thesis, as it will be one of the aims to understand how the It department usually works in companies that telecommute, besides what are the efforts from the employer's side when bringing technological tools and expertise to teleworkers. Once again, the absence of theories within such studies is highlighted, as they appear to come from a more practical and functional aspect.

Technology is said to be a key element that makes telecommuting happen. As Information Technology (information systems + information technologies) allows different tasks to be performed and information to be exchanged (e-mail, voice or video conferences, the internet, and corporate intranets, among others), it is possible to say that IT is essential for telecommuting (Dewett and Jones, 2001). To better understand the use of IT in organizations, a definition must be established. Information systems are basically the group of various software platforms and databases, while information technologies come in the form of different communication media and devices which connects information systems, people and information. Together, Dewett and Jones (2001) define them as Information Technology. Nevertheless, in quantitative research conducted by Jackson, Leonardi and Nelson (2003) along with telecommuters in a company, the scholars demonstrated that, even though information technology is the key to making teleworking happen, it is considered a tool that supports the teleworkers' work, instead of being considered a tool that drives their work.

The researchers also show the importance of having a broadband connection when telecommuting, as it moves data more quickly, allows employees to remain always online and it has

been proven to enable more productive work. In this study, it is said that nowadays with the evolution of technology and the cheaper prices for better internet connection, broadband has been adopted on a large number of companies and houses. In 2012, broadband was adopted by 72% of the American population (NTIA, 2013). However, the study presents interesting data regarding such statistics. First of all, the research points to the fact that teleworkers consider telework as “just work”, showing that teleworkers are not technological innovators, but they accept that the accomplishment of their work depends on technology.

Furthermore, the same study provides important information about the type of organization shows that teleworkers in “non-tech” companies are mostly responsible for producing their work environments, when it comes to technological equipment and support. In contrary, technological companies tend to provide more resources, including equipment (laptops and software), besides IT support. Also, most of the organizations demonstrated that they provide no formal telecommuting policies, besides little to no support for their telecommuters. Such information helps prove that, even with a lack of IT support from the companies, the employees were still able to telework, and in many occasions they have figured out how to manage technological problems by themselves. As a contributor for this research, it forecasts that even companies without a large IT team or technological support will not have telecommuting as an obstacle. Nevertheless, technology was also confirmed as a core attribute of telework, as telecommuters indicated that without the ability to access documents, databases, intranets, etc. they could not perform their work. Therefore, it is to conclude that organizations must provide teleworkers with at least some products of information technology, besides this fact, it is demonstrated that technology is a strong point when telecommuting is concerned, and it might be a powerful factor for adopting the practice or not in the organizational environment.

When security issues are concerned, telecommuting may be an obstacle for the company. It has already been a subject of studies; how teleworking increases data security concerns (Gray, Hodson and Gordon, 1993; Katz 1987). It is also well known, especially with the popularization of the broadband and wireless services, that confidential information can be exposed. A common solution to prevent this problem, which is usually adopted by firms, is to secure the teleworker with VPN (Virtual Private Network) and install anti-virus software (Phifer, 2003). Nevertheless, when researching about telecommuting, it is important to keep in mind that some companies might consider this information exposure as a threat.

Finally, this research on technology and mobile work is essential to understand the effects on organizations, as negative views of teleworking in a company might lay on the lack of a structured and equipped Information Technology department, or concerns about security.

Moving on to the third studied topic on the field, the third set of studies involves the interaction between telecommuting, traffic and the environment, which happens to be partially the focus of this research.

2.3.3 Communication Versus Traffic

Research shows the positive results when opting for teleworking, since the late 1980s. A study accomplished in 1991 showed the decrease in trips made by employees after they began to telecommute. In the study, the scholars administered a three-day trip diary from telecommuters, and the findings empirically demonstrated that, when telecommuting, there was a decrease in approximately 1.94 versus the 3.95 trips a day that were made before (Kitamura, Mokhtarian, Pendyala and Goulias, 1991). The research also showed that consequently, there was a reduction of VMT (Vehicle Miles Traveled), which dropped from 53.7 miles to 13.2 miles on telecommuting days.

Another study converted the reductions in VMT into substantial emissions reductions. Telecommuters reduced average VMT by 77%, what translated into the reduction of 48% in total organic gases (TOGs), 64% in monoxide (CO), 69% in nitrogen oxides (NO), and 78% in particulate matter (PM) (Koenig et al., 1996).

In a literature review, Walls and Safirova (2004, p. 19) concluded that, besides demonstrations on studies of reduction of VMT and gas emissions,

“No study that [they] reviewed showed a significant increase in non-commute travel for telecommuters. Findings across the studies show that the average number of daily trips taken on telecommuting days is anywhere from 27% to 51% lower than on non-telecommuting days, and VMT is 53% to 77% lower. These reductions lead directly to significant reductions in organic gases, NO_x, CO, and particulates.”

Hence, it is to expect that, even when working at home, an employee tends not to increase mobility and traffic congestion with other activities, which can mean that a focus on communication and teleworking is not likely to actually foster mobility.

When traffic congestion is concerned, teleworking has also shown to be beneficial in avoiding congestion caused by traffic. A study performed in Tokyo, Mitomo and Jitsuyumi (1999) observed the growth of telecommuting in the year of 2000 and calculated the expected growth of 14.5% to 28.3% of the total workforce telecommuting by 2020. By obtaining this expectancy, they have calculated reduction of mass-transit congestion by 2010. The results demonstrate a decline in congestion of between 6.9% and 10.9% because of mobile working, which is equivalent to ¥23–¥75 billion, an equivalent of 166-544 million euros of opportunity cost per year. This research emphasized the value of telecommuting and recommended that the government should pursue design policies which would foster the penetration of telecommuting.

Moreover, studies about traffic and mobility have also exhibited positive results for employees. One of the greatest benefits for employees is the reduction of time required to physically commute to work, which, in most cases, last around one hour a day (Baruch and Nicholson, 1997).

When analyzing the cost benefits of teleworking for the public sector, Shafizadeh et. al. (2000) points out the justifiable reasons to promote telecommuting, though there are difficulties when explaining localized benefits, since they are mostly dispersed throughout the transportation system. Indeed, it is more likely that segments of the public sector could lose fuel tax revenues because of teleworking when the advantages are dispersed over a wide area. In such case, the success of telecommuting would rely only on the employer and the employee desire to reach adequate perceived benefits.

2.3.4 How is Traffic Reduction Interesting for Organizations?

Finally, there are different types of research approaching the implications of teleworking for employers. As telecommuting shows to have great benefits for employees and the environment, the question remains on how exactly companies might also benefit from it. Additionally, obstacles and disadvantages are also present when traffic reduction and telecommuting within organizations are concerned. Such aspects are approached here as well.

In a table presented by Shafizadeh, Mokhitarian, Niemeier and Salomon (1998), the costs and benefits associated with telecommuting are outlined, from the public, private and individual sphere. Most benefits concerning the private sphere (organizational) will be approached on this chapter.

		COSTS	BENEFITS
Public	Start-up	<ul style="list-style-type: none"> • marketing/training development • evaluation 	(none)
	Ongoing	<ul style="list-style-type: none"> • ongoing marketing/training • latent demand realization • urban sprawl 	<ul style="list-style-type: none"> • <u>travel reduction</u> • <u>emission reduction</u> • improved highway safety • increased economic development (employment opportunities for underemployed/mobility-limited labor segments) • increased neighborhood safety
Private	Start-up	<ul style="list-style-type: none"> • planning • marketing/training • equipment 	(none)
	Ongoing	<ul style="list-style-type: none"> • internal program administration • marketing/recruitment • <u>training</u> • <u>equipment maintenance/ replacement (less salvage)</u> • <u>communications</u> • decreased workplace interaction/ immediate access • security of data 	<ul style="list-style-type: none"> • <u>space cost savings (office and parking)</u> • recruitment (access to best talent and broader labor markets) • improved retention • <u>increased productivity</u> <ul style="list-style-type: none"> ◦ less absenteeism ◦ less sick leave ◦ longer hours ◦ fewer distractions (greater productivity per hour) • improved customer service • disaster recovery • public relations • compliance with air quality/trip reduction regulations
Individual	Start-up	<ul style="list-style-type: none"> • <u>equipment</u> • <u>software</u> • stress to perform 	(none)
	Ongoing	<ul style="list-style-type: none"> • <u>communication costs</u> • <u>energy costs</u> • space costs • decreased workplace interaction • loss of support services • loss of boundary between work and home 	<ul style="list-style-type: none"> • <u>travel time savings</u> • <u>travel cost savings</u> • <u>misc. cost savings</u> • personal flexibility • reduced stress • ability to get more/better work done • ability to work while mobility limited or physically distant from workplace • more time with family

Table 1. Private, Public and Individual Costs and Benefits Associated with Telecommuting (Shafizadeh et. al., 1998)

As it can be viewed in the table the private sphere, companies benefit from a diverse range of advantages concerning expenses, productivity, among others. On the other hand, organizations must invest in the practice through trainings, equipment, communications and security of data. As the table presents a brief look on the benefits/costs of telecommuting, such and further aspects are also approached below.

Pinsonneault (1999) created a literature review on the topic of telecommuting, and mentioned the many advantages for organizations. Telecommuting, according to some studies, decreases absenteeism, as well as increase employee loyalty to the organization. As an example, on a research done by Solomon and Templer (1993), 75% of organizations answered that they were satisfied with the implementation of telecommuting. Telecommuting also seems to reinforce the relationship between the employee and the organization (Olson, 1987b). Furthermore the practice demonstrated to help keeping employees that would otherwise leave the firm, or attracting new employees due to the possibility of telecommuting (Davenport and Pearlson, 1998; Psikurich, 1996). According to Pinsonneault, these findings can be related to the fact that telecommuting decreases constraints enforced by traditional organizations.

The scholar also mentions the fact that higher productivity and quality of work associated with telecommuting is the most cited organizational benefit in literature (Alvi and McIntyre, 1993; Barthel, 1995; Baruch and Nicholson, 1997; Duxbury and Higgins, 1995; Nilles, 1994).

In a study focused on TDM (Transportation Demand Management), it is mentioned that mobile working, as part of TDM, can also enhance corporate image for being seen as a contributor to environmental issues and expand service hours due to the flexibility offered to employees (Winters and Hendricks, 2003).

Horner (2011) argues that employers also profit when their workers telecommute, since organizations can decrease expenses for workspace, parking, and energy use. In a study by McCune (1998), IBM reported saving US\$75 million by selling buildings and reducing its leased office space. Moreover, the company Ernst and Young was able to save US\$25 million each year by decreasing office space by two million square feet (Monnette, 1998).

Furthermore, case studies about employers in companies such as Hewlett-Packard and Macy's demonstrate that they have been happier and more productive when telecommuting, which reflects on the organization. Lastly, companies also become less vulnerable to power outages, workplace illness or when a substantial amount of workers telecommute. Cascio (2000) has also studied the business reasons for virtual workplaces. The author highlighted the reduced real estate expenses, the increased productivity, higher profits, the improved customer service, access to global markets and environmental benefits. Productivity seems to be a strong factor for telecommuting. As an example, IBM showed gains of 15 to 40% in productivity.

Nevertheless, Shafizadeh, et al. (2000) defends that teleworking is most favorable for organizations when productivity is realized among the highest paid employees and when parking and office space savings are accomplished. In this research it also mentioned that, even when combining empirical evidence concerning the costs and benefits of teleworking, it is possible to discover that the alternative might not make “economic sense”. In order to explore this aspect Sing (1996) developed a study that considers different hypothetical scenarios, where organizations would telecommute and then analyze the economical advantages, in order to understand if telecommuting is economically viable in Singapore. One important finding was that, for telecommuting to make economic sense, it is advisable for employees to telecommute at least 2 to 3 days per week. Organizations also have other savings in office space and parking, nevertheless, productivity gains are considered to be the most effective economical benefit, as is shown in the different scenarios to convey 5% of gain in productivity.

Nevertheless, organizations also might suffer from telecommuting, as it also has negative impacts. As an example, employees that fit better to telecommuting due to motivation, organization and not requiring constant supervision, are those organizations that would prefer to maintain on-site (Johnson, 1997). Besides that, a loss of synergy caused by the absence of key employees in the office can be a disadvantage (Davenport and Pearlson, 1998).

Another negative impact that is often discussed in the field of telecommuting is employee management when they are off-site. Is it often an issue, for example, when managers have to adapt their managing style to the new reality inflicted by telecommuting (Christensen, 1992). However, in contrast to this disadvantage, scholars have argued that managers can supervise a telecommuter’s work by analyzing the objectives and output, instead of focusing on activities. A Harvard Business School Publishing (2000) newsletter also indicated that trust is the basis of telecommuting, and that this new model of work shifted from supervision of tasks to the supervision of the final product, or results that the teleworker accomplished. In the document, some ethical issues and rules to telework better are also mentioned, such as not installing keyboard monitoring to track the employee’s productivity, as it would damage the trust of the employee-manager relationship.

Although such range of studies concerns the economical advantages of the practice, there has also been said to be difficult to objectively evaluate the financial benefits of telecommuting (Alvi and McIntyre, 1993, Doswell, 1992).

For these reasons, it is important to understand when exactly online communication or teleworking might substitute mobility, from the organizations' point of view. Furthermore, to understand the profit of organizations when traffic is reduced the reason why it is wanted by employers, and if there is any type of stimulation steaming from politicians (e.g. laws or decisions that foster telecommuting in organizations).

2.3.5 Political Decisions that can Foster the Adoption of Telecommuting within Organizations

As mentioned before, telecommuting brings many improvements to society and cities, such as the reduction of emissions and traffic congestion. Hence, it is sensible for the government to engage in the topic and supply incentives for people to telecommute.

In a study on the management issues in implementing a state telecommuting program in Florida accomplished by Sullivan and Durand (1994), the scholars have indicated that the role of a government department, in this case the Department of Management Services in Florida, could be support by establishing administrative guidelines, providing training and helping companies to develop telecommuting plans.

During the rise of telecommuting back in 1980, there were already incentives coming from the government in the US to help organizations that adopted this new type of work. Back then, the only significant incentives were in the form of telecommuting education and trainings, which were offered by many US states (Walls, Nelson and Safirova, 2005).

Later on, the US Government has started to propose and create other incentives for organizations that telecommute. For instance, a tax benefit to employees that work for companies that apply the concept of telecommuting has began to be employed, in the form of a deduction. However, there are some strict rules to be followed, such as the telecommuting adoption must be for the convenience of the employer, even though in many cases the employee is the one asking to work from home. Along with this tax deduction, another possibility to obtain a tax benefit as the employer would be when the supply of items to perform the work (such as computers, furniture, telephones, etc) would be the responsibility of the company, helping the employer therefore to obtain a tax reduction. ("Tax Telecommuting," Retrieved in 2014).

A highly mentioned telework program was from the Oregon Department of Energy, which have considered a diversity of solutions to decrease traffic congestion and pollution. The solutions

include the increase of public transit, commuter pool vehicles, bicycles, car sharing and finally, telecommuting. The program provides tax credits to businesses that support such transportation solutions. Therefore, organizations that purchased equipment to support telework were eligible for the Business Energy Tax Credit. (“Oregon Transportation,” Retrieved in 2014).

Another tax credit incentive is the one created in 2011 and approved by the Virginia General Assembly, also in the US. This legislation offers a tax credit of up to \$1,200 per employee and up to \$50,000 per organization for telecommuting expenses, during the years 2012-2016. The eligible expenses for the credit can include the payment of computers, hardware, software, modems, data processing equipment, telecommunications equipment, Internet connectivity equipment, computer security software and maintenance fees. The aim of the Virginia Telework Tax Credit was basically to eliminate car trips by reducing commutes to and from work. (“Telework Tax Credit for Businesses in Virginia,” Retrieved in 2014).

Emissions trading is another form of telecommuting incentive. Aiming to reduce pollution, this market-based approach adds profit by creating tradable pollution permits. It stands out from other practices as it motivates better performance among companies, instead of regulating organizations based on the threat of penalties. Emissions trading does not directly reduce aggregate emissions, nevertheless, good results can come from it. As an example, companies can purchase extra emissions reductions which credits can be purchased by or donated to an entity (usually an environmental group), as accomplished in the federal emissions offset program (Walls, Nelson and Safirova, 2005).

The Ecommute Program is another form of incentive to telecommuting, as studied by Walls, Nelson and Safirova (2005). This program established pilot telecommuting programs in five big cities in the USA, aiming to study the feasibility of addressing air quality concerns through teleworking. Even though the program had its complexities, it was recognized as an approach that fostered teleworking, which brings, most notably, traffic congestion benefits to society.

2.3.6 Reasoning the State of Research on the Field of Telecommuting

As demonstrated within this chapter, much research on the field of telecommuting and online communication was accomplished. The benefits can basically be divided into (a) employees, (b) companies and (c) society. When telecommuting, employees profit more time with family, less travel stress, flexibility and a better space for concentration, whereas organizations take advantage of reduction of costs, more productive employees, less absence, hiring advantages, among others.

The benefits for society were explicitly demonstrated when the environment and higher air quality are concerned, besides a positive of decrease on traffic congestion.

Employees and companies also suffer disadvantages when telecommuting, such as isolation problems, distractions, telecommuters' management problems and technological security issues. Nonetheless, it is clear that telecommuting brings many benefits not only to employees and organizations, but also to society and the environment. As exposed within this chapter, telecommuting has the power to decrease Vehicle Miles Traveled, which translates into less toxic emissions and also less traffic congestion. Additionally, the technological aspects of mobile work show that technology is one of the most important parts of the practice, and that, in order for telecommuting to be beneficial to companies, there is a need for a quality IT department within organizations.

Even though many important studies exhibit important findings in the field of online communication and telework, there is a need to understand how such practices can flourish within the organizational space, through the views of leaders and deciders in companies. Through this understanding, it will be possible to establish the best ways to foster telecommuting, which is an extremely efficient way to lower environmental and traffic issues, besides to bring up new concepts for future consolidation of theories in this field. Hence, the research questions that will lead this study to such accomplishments will be now presented.

2.4 Research Questions

In order to answer the question “How can online communication be a substitute for mobility in organizations?” sub-questions were produced, which will lead to the understanding of the interest on telecommuting in organizations. These questions covered the usage of telecommuting in the company, the benefits and disadvantages of mobile working and the incentives arising from political decisions and laws, as seen below. As being crucial for the understanding of the main research question, a sub-question about technology relating to the IT department of each organization participant and telecommuting was created. The main reasons behind the choice of the sub-questions can be followed within the paragraphs below.

In order to understand the main research question, there is a need to comprehend how employers apply telecommuting within their companies. As mentioned within the second chapter, there are specific situations in which telework can be better applied, therefore the first sub-question approaches this aspect. Aligned with the first one, the second sub-question seeks to understand what

the missing factors when telecommuting are. As seen within literature, the Media Richness Theory and studies on the management of the telecommuter might offer some tips of aspects that are lacking when adopting the practice. There is also an interest coming from the literature review to check if telecommuting can actually cause more traffic, since teleworkers have more freedom and therefore the possibility to wander around.

Past studies about telecommuting make clear the many advantages of the practice. Here, it is intended to understand the reasons behind the interest of employers in applying this form of work, in order to comprehend how it can be stimulated within companies. As the literature review also highlighted different disadvantages, it is also important to ask employers the biggest challenges when adopting the practice, with the goal to view how such challenges can be overcome.

As presented by some telecommuting studies, trainings and education about the practice can organize and therefore offer the best of telecommuting within the work environment. Hence, there is a need to ask employers if they pursue any efforts in such direction. Efforts about technology are also highly required in telecommuting, as much research emphasizes that technology is the core of this practice. Through the understanding about the IT department within organizations, it is clarified whether some obstacles come simply from the lack of efforts when technology is concerned.

Lastly, one of the goals is to realize, as mentioned within some studies, the power of political decisions and incentives for companies to foster online communication and mobile work. Research in this field often show the positive environmental accomplishments when such political stimuli are created, however, there is a demand to comprehend how employers view such incentives, and if they can be really a strong factor for companies to have a work focusing on online communication instead of traffic and face-to-face interactions.

Main research question: How can online communication and telecommuting be a substitute for mobility in organizations?

Sub-questions:

What are the specific applications/situations where physical traffic is replaced by online communication?

For the situations when communication cannot substitute mobility, what might be missing?

Are there situations when communication actually fosters mobility?

What are the reasons for these developments, which brought organizations to utilize communication rather than physical traffic? Is this desirable for employers? Why?

What are the biggest challenges of telecommuting within organizations?

What are the efforts from the organizations, when creating strategies to stimulate and organize telecommuting?

What is the role of technology when telecommuting? Is technology ever an obstacle when adopting this practice?

When considering politics, is it beneficial to stimulate telecommuting in organizations? In other words, are there any laws (e.g. taxes) or political decisions that foster telecommuting?

Which political decisions (that have not been accomplished yet) would be helpful in order to induce organizations and businesses to apply telecommuting?

After the origination of the research questions, a scheme was design to work as a basis for the interview guideline.

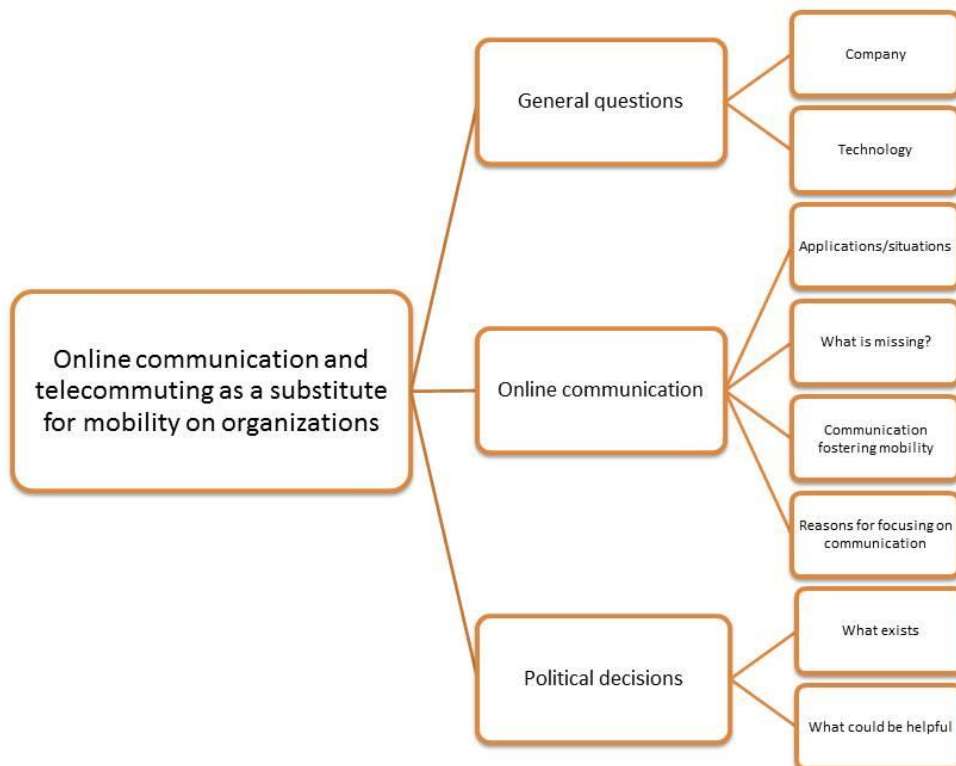


Figure 4. Telecommuting Scheme for Guideline

3 Methodology

3.1 Research Design

In order to understand the employment of online communication in the organizational world, a qualitative method is applied, based on interviews that are accomplished with experts in the field. As suggested by Bryman (2008), the basic steps of this study are: (1) theoretical/literature background studying, (2) creation of research questions, (3) selection of relevant subjects (interviewees), (4) collection of relevant data, (5) interpretation of data, (6) creation of concepts and lastly, (7) writing findings and conclusions.

The qualitative approach provides deep information on perspectives from different individuals, which would not be possible with quantitative research. It allows a deep examination of the interpretation of the telecommuting world by its participants, making it possible for an inductive method to be applied, in which the theory or concepts are generated out of the research (Bryman, 2008).

It is important to remember that qualitative research has its limitations. Researchers often criticize qualitative research for being impossible to generalize (Bryman, 2008). Indeed, the professionals of this research are not meant to be representative of the whole professional population, but the findings of this study are meant to generalize theory rather than populations. It is intended to collect strong and important data about telecommuting in organizations, and posteriorly to create concepts that might help researchers to apply such concepts to a whole population in the future (as it can be seen after on the Recommendations and Future Research chapter). Besides that, it will show a deep understanding of the facts that influence decision making on the field, therefore offering a better interpretation of the complex phenomena involved.

3.2 Guideline

Aiming to answer the research questions and to understand the practice of telecommuting in organizations, data was collected from a diverse group of experts (this topic will be further explored). The advantage of qualitative interviewing is that the researcher has an interest in the participant's point of view, which is offered in this case (Bryman, 2008). It also gives more flexibility for the interviewee to respond on the direction s/he wants, and this allows the researcher

to have a broader sense of the topic, besides the possibility of adjusting the emphases of the research afterwards, in case new issues emerge during the interviews (Bryman, 2008).

The interview guideline was composed of four parts:

(1) General facts about the interviewee and the company – company industry, interviewee's position and main tasks.

(2) Telecommuting in the organization – the usage, advantages, obstacles, applications, reasons to apply the practice, and communication in relation to mobility.

(3) Technology – IT department, how technology is contributing to teleworking and obstacles.

(4) Political decisions – laws, tax incentives or government stimulation to telecommuting; which of political decisions are strong factors for the adoption of telecommuting.

It is important to remark that, although the guideline and the research questions approached the topic of technology, this topic is not exactly the focus of this research. However, a demand for such questions was observed, as technology can be an obstacle in an organization, when telecommuting is concerned.

As advised by Bryman, an order on the topic areas was created, so that the researcher would have a better view of the topics during the analysis process. The questions were also formulated in a way that would posteriorly help to answer the research questions; the language used was understandable and relevant to the interviewees; the interviewer was familiar with the environment where the participants work; and lastly, a good-quality recording machine was utilized, although one of the interviews had a lower quality audio in the end.

Furthermore, the interviewer attempted to collect and confirm the necessary information about the participants and their respective companies before each interview instead of directly asking them, in order to show the interviewees that the researcher was well informed about them.

During the interviews, some examples were given to the participants when they were not familiar with some practices or information that were asked, i.e. when the political decisions questions were asked, the interviewer explained a bit about them and offered some examples of situations where political decisions regarding telecommuting appear in other countries. Moreover, when the interviewee could not think about a specific situation that was asked, the interviewer used

some examples of statements already given from the same interviewee to clarify what was being asked.

When transcribing some interviews, the researcher was careful to try to pick up whenever the interviewee would hesitate or show certain insecurity to answer some questions. Non-spoken expressions could help form a set of impressions that would afterwards offer extra observations on the findings.

3.3 Semi-structured Interviews

The participants were allowed to talk freely about their experience and knowledge regarding telecommuting in their perspective organizations; however, they were always guided through questions and observations from the interviewer. That is the reason behind the usage of a semi-structured guideline, which was employed here. This choice was also because, unlike the structured, it allows one to obtain information from the interviewees that will not originally or necessarily be on the first written questionnaire (Cohen, Manion, and Morrison, 2007). Moreover, questions here may not follow exactly the manner that they were outlined in the guideline, and perhaps not on the same order, which is not a problem when applying a semi-structured guideline. This type of guideline was chosen to take maximum advantage and information from these professionals, and hence understand even better the question proposed.

The interviews were performed personally, via Skype, and written. The interviews that were accomplished face-to-face or via Skype were recorded, and after, transcribed. The written interviews were simply translated when needed, as the data is composed of two languages: English and Portuguese. Below it is possible to see such information more specifically with numbers:

- Face-to-face interviews: all performed in English (2 interviews on total).
- Skype interviews: 1 performed in English and 4 performed in Portuguese and then translated to English.
- Written interviews: all performed in Portuguese and then translated to English (3 in total).

It is stated by Nygren and Blom (2001) that many qualitative researchers assume that oral interviews will generate best quality data. It is often suggested that written interviews tend to be more organized, coherent and have more self-reflection than orally performed interviews (Ong, 1985). Written interviews might not be advised for researches that require spontaneity, since on

written interviews the participants will have more chances to reconsider the answers, and more time to think about them, which can bring limitations to the data. Nevertheless, spontaneity is not required for this research. Here, the researcher is worried about and focused on the facts regarding the practice of telecommuting in organizations, rather than deep sentiments concerning the practice. Therefore, the different types of interviews are not expected to influence the results of this study, although this application is to be paid attention to and considered as a possible limitation.

3.4 Sample Selection

With the goal of obtaining the most relevant and clear information on the topic, the sample selection of experts was accomplished keeping in mind their position in the company. The type of sampling used for this study was convenience and opportunity sampling, which was a product of both availability from the participants' side and experts that were possible to reach from the researcher's side. Besides the convenience factor, the sampling method was also chosen since the study focuses on an in-depth analysis, rather than being concerned with issues of representativeness (Bryman, 2008), meaning that the focus here is not to generalize the findings for a whole population, but to create concepts that might contribute for future research and theories.

The selection of experts had a focus on:

- 1- Managers and coordinators from organizations that apply the concept of telecommuting;
- 2- Employees from the technology department from organizations that apply the concept of telecommuting.

The first group of experts was selected, because it is expected that they have more knowledge on the companies' policies, besides having the experience managing or coordinating employees, which would offer this research the perspectives from the organization and the employers.

The second group of experts could offer different and relevant perspectives on the technological aspect and perhaps contribute to questions regarding the companies' policies.

It was expected that, when combining the two types of experts, the outcome would be results that would express different sides and offer therefore an overview coming from different perspectives, but always with a focus on the organization.

To find the relevant professionals for this research, employees from different companies were contacted and invited for an interview. In the end, there was a sum of 10 people interviewed: one CEO, two directors, two managers, two coordinators, one supervisor and one analyst. It is believed that the amount of interviewees can provide relevant results, although they must be analyzed carefully and always taking these numbers into consideration. Furthermore, only one participant belongs to the second group of experts, but the researcher believe his participation to be enough since the other interviewees showed to have good knowledge about the IT team of their respective company.

The size, internationalization, location and industry of the companies were not important factors when selecting the professional to interview. Nonetheless, such information will be taken into consideration when analyzing the results. The interviews were performed with the following interviewees:

Interviewee	Position	Company Industry	Country	Interview type
Ana Claudia Braun Endo	Marketing Manager	University	Brazil	Skype
André Mielke	IT Project Manager	Project and Logistic Consultant	Germany	Personally
Dion Chagas	Clients Supervisor	Ad Agency	Brazil	Written
Ester Zanelatto	Coordinator	Ad Agency	Brazil	Skype
Fabiola Baricelli	Marketing Director	Cosmetic - retailer	Brazil	Skype
Florian Weißenstein	CEO	Online marketing	Germany	Personally
Johannes Wiegerinck	Campaign Planning Director	Ad Agency	Brazil	Written
Marina Lotfi	Commercial Analyst	Automaker	Brazil	Skype
Marina Luisa	Programming Coordinator	Fashion Retailer	Brazil	Written
Paulinho Ramos	Digital Marketing Coordinator	Real Estate Company	Brazil	Skype

Tabel 2. Interviewees and Their Respective Interview and Company's Information.

3.5 Data Analysis

When the approach is concerned, the inductive approach will be utilized. The idea that online communication can be a substitute to physical traffic stems more from critical beliefs rather than theories, which indicates an approach coming from observations and data collection, and posteriorly forming theories for what was found (Hesse-Biber and Leavy, 2011). The strategy is to collect data and afterwards to attempt to work towards a theoretical integration of what was found, moving

therefore from data to theory (Hyde, 2000). The approach also provides a focus on individuality and uniqueness. Nevertheless, it is clearly important to have a theoretical understanding about the subject, in order to comprehend which conclusions can be already drawn from previous studies. Thus, the aim here is to collect data that can explain the decision of applying teleworking on organizations (from previous theories) and consequently to develop a theoretical framework of the reasons why companies apply it or not.

In order to have a better view of the findings and to accomplish a correct and to the point analysis, the thematic analysis (Bryman, 2008) was applied. The strategy on using this type of analysis is to create a Framework, described as a matrix based method to organize and summarize data on qualitative research. This method is executed through the building of an index of central themes and subthemes, which are represented on a table. The steps when applying thematic analysis are: (1) reading and re-reading thoroughly the transcripts, (2) creating core themes to display the data, (3) organizing subthemes within the matrix, (4) fitting each sentence of the transcripts into each theme (which is also divided by interviewees), and the last and optional step (5) would be the creation of new subthemes as a demand for them are noticed when applying the data into the matrix. In the present study, it was decided not to create subthemes, but to apply a scheme of colors to the answers that approached the same aspects, simplifying therefore the analysis process.

As advised by Bryman, each fragment had an indication of where it came from, the language of the interviewee was kept as far as possible, abbreviations were sometimes used so that the cells were not so full and not so much quoted material was inserted.

The thematic analysis fostered the discovery of patterns, as it highlighted the most crucial aspects of the phenomenon of telecommuting in organizations. Additionally small corrections on the list of themes were performed during the analysis step, as new ideas and new ways of categorizing were discovered in the text. These steps corroborated to the comparison of the groups and the variety of perspectives on issues (Flick, 2009; Gibbs, 2007).

3.6 Trustworthiness, Rigor and Quality

When applying a quantitative method, the researcher usually counts on practices such as validity and reliability to establish and assess the quality of the research. However, such practices can not be applied the same way for qualitative research (Lincoln and Guba, 1985).

Facing such problem, (Golafshani, 2003) created a concept that fits better to this kind of study. In this case, trustworthiness is connected to both validity and reliability, and it can be “measured” through the extent to which this investigation and its results can be dependable. Rigor is connected to details, therefore, making sure that details were paid attention to and that the study is correct and accurate. Finally, quality is related to the establishment of confidence in the study’s results. In order to achieve these criteria, it is important to (a) describe every step and procedures precisely, (b) reach a clear distinction between the interviewees’ statements and the interpretations of the researcher and (c) verify that the answers and conclusions by the interviewees, since they are the only ones who can ensure that their interpretation is veracious (Flick, 2009; Lindlof and Taylor, 2011; Patton, 2002).

Therefore, the method and data collection was carefully detailed here, the researcher sought to perform a clear statement of her position and interpretations from what was said on the interviews and finally the results were briefly presented and discussed with 2 interviewees, in order to have a final check if the findings represented their reality.

4 Results

Before exhibiting the findings, this chapter starts with a brief introduction about each research participant and their respective company. Such introduction allows the reader to have most of the information about each interviewee fresh in her/his mind, and therefore the reader will have the possibility to relate this information easily to the findings.

Posteriorly, the results are presented according to each theme, and within each theme the set of subthemes are described and discussed along with the data obtained during the interviews.

4.1 Research participants: a brief introduction to their profile

4.1.1 Brazilian interviewees

Ana Claudia Braun Endo (AC)

Ana was the Marketing and Relationship Manager of a very recognized university in Brazil, which has 5 branches and about 3.000 employees. She has worked for the headquarters in São Paulo and was in charge of institutional campaigns, the branding, public relations, market research and events. Described as a very conservative company, its employees rarely practice telecommuting. This interview was accomplished through Skype and then transcribed on a file.

Dion Chagas (DC)

Dion works as a Client Supervisor in one of the top advertising agencies in Brazil. The organization is present in different countries around the world, with about 40 branches. The São Paulo branch has a total of 100 employees. Dion is in charge of the alignment of each campaign and he is the intermediary between the clients and the agency's employees. Although there is no stimulation for telecommuting at this company, employees were allowed to do so depending on the department, and they often used tools such as Skype to communicate with clients. This was a written interview in Portuguese, and then translated to English for the analysis.

Ester Zanelatto (EZ)

Ester also worked for a small online communication agency. The company only had three employees when it started, but later it grew to around 15 employees, within one branch. While working in this agency, Ester was a coordinator and in charge of digital campaigns. In the agency,

usually only the higher position employees would telecommute with frequency, whereas others telecommute only in case a specific job had to be done during nonworking hours. The interview with this participant was done via Skype and then transcribed.

Fabiola Baricelli (FB)

As a Marketing Director, Fabiola was in charge of the whole marketing department of a cosmetic retailer in Brazil. The company has three branches in three cities in Brazil, and it has about 150 employees, besides 90 salesmen and promoters. The practice of telecommuting is strong within the company, since they have to communicate often between the different branches. The interview was written in Portuguese and later translated to English.

Johannes Wiegerinck (JW)

Johannes works as a Campaign Planning Director in an advertising agency, which has a total of 22 employees and one branch in São Paulo. The employees from this company do not telecommute often, but the practice occurs usually when there is a holiday. The interview with Johannes was written in Portuguese and then translated to English.

Marina Lotfi (ML)

Working as a Commercial Analyst, Marina is an employee of one of the biggest automotive manufactures in the world. The organization has some branches in Brazil and its headquarters is located in São Paulo. There are also branches spread around the world. The company has about 5.000 employees in Brazil alone. Marina works for the administration department, but with a focus on trade marketing. Besides the regional managers who telecommute very frequently, employees of the company usually only telecommute during trips or in case they see the need to finish an important task. The interview was accomplished via Skype and then transcribed.

Marina Luisa (ML2)

Marina works as a Programming Coordinator at one of the biggest fashion retailers in Brazil. This organization has 217 stores around the country, 2 industries and its headquarters is located in São Paulo, which has about 2.000 employees. Marina is in charge of Visual Merchandising. While the Sales Department telecommutes very often, the rest of the company does not take advantage of this practice with frequency, as it was explained that there is a bureaucratic process for those who have the desire to do so. Marina's interview was written in Portuguese, and then translated to English.

Paulinho Ramos (PR)

As a Digital Marketing Coordinator, Paulinho works at a real estate company which has about 15 branches in Brazil, but they also work internationally with some specific clients in the USA and in Europe. Employees at the company do not practice telecommuting very often, however, the practice depends on the department and the tasks of the employee in question. The interview with Paulinho was done via Skype and later transcribed.

4.1.2 German interviewees

André Mielke (AM)

André works as an IT Project Manager as a Project and Logistic Consultant. The company has one branch in Ilmenau, Germany and about 30 employees. At the company, most employees practice telecommuting with a high frequency. The interview was accomplished face-to-face, recorded, and then transcribed.

Florian Weißenstein (FW)

Florian is the CEO of a Online Marketing company, which has two branches in Germany and about 20 employees. The company is comprised of three fields: a nutrition portal/app for androids called Yazio; two e-commerce websites; and a group of couponing portals present in different countries, such as Brazil, Spain, Portugal, Turkey, Mexico and Chile. Most of the employees telework with frequency especially after work hours or during the weekends. This interview was done face-to-face, recorded, and then transcribed.

4.2 How can online communication be a substitute for mobility in organizations?

In order to answer the main question of this study, the sub-questions will be displayed here, followed by the findings and results that originated from the interviews. Following this structure, this group of research questions is intended to provide all the acquired knowledge and to answer the main question *“How can online communication and telecommuting be a substitute for mobility in organizations?”*

4.2.1 The Usual Applications of Telecommuting within Companies

The first step of the interviews, besides collecting information about the company and the interviewee, was to understand the practice of telecommuting in their companies and to answer the

question “*What are the specific applications/situations where physical traffic is replaced by online communication?*”

The practice of telecommuting was often applied to reach clients (AM, line 46), talk to suppliers or to maintain contact with people from other branches (DC, line 30). After this, the second most approached answer was that, with mobile work, employees would be given the opportunity to perform extra work or check something specific outside of the normal working hours, for example, when they arrived at home or checking their emails on their mobiles while being stuck in a traffic jam (FW, line 43).. Employees were also said to telework simply because they wanted to (AM, line 84), and some companies were flexible enough to allow this to happen (in this case, mostly small companies). Another situation in which employees would telecommute, as expressed by a company, was when they were travelling to their home country (FW, line 26), usually outside the vacation period. Lastly, an organization mentioned that the practice of mobile work was not well seen, mostly because the company was older and more conservative regarding new forms of work (AC, line 30).

4.2.1.1 Frequency of Telecommuting

When the frequency of telecommuting was concerned, most companies telework very often, almost daily. Three participants (Ester, Marina Luisa and Paulinho) mentioned that their co-workers would telecommute once or twice a week, while Johannes mentioned that the practice of this type of work occurs irregularly. Furthermore, Ana highlighted that the company she worked for is a bit closed to the practice (AC, line 30); therefore she did not mention a frequency of teleworking.

4.2.1.2 Number of Telecommuters

The number of telecommuters within the organizations varied from 50% to 10% of the company. Nevertheless, one of the interviewees mentioned that “everybody teleworked sometimes” (EZ, line 40), but it was usually the managers and coordinators, as in most cases. The Sales and IT departments were also highly mentioned for having the higher number of employees that telework.

4.2.1.3 Best Fitting Situations for Telecommuting

Regarding situations when mobile work occurred, it was usually performed either by managers, because they usually took care that the company guidelines were being followed; the salesmen,

usually because of their focus on clients; or the IT employees, that had the advantage of understanding the technology.

4.2.1.4 Types of Telecommuting

As explained in the beginning of this thesis, telecommuting appears in many different forms. When questioning the interviewees, it was found out that Skype is the most frequently used tool, mentioned in six interviews. This tool is followed by Email, Dropbox, Home Office and Telephone. Some mentioned tools were a bit more specific and used by only one of the companies, for example Team Fuel, Face Time, WhatsApp and Google Hangout. Although very famous, Facebook was also only mentioned once.

4.2.1.5 Criteria of Selection of Telecommuters

When asked about which criteria the companies would use to select teleworkers, different answers were given. The most mentioned criteria were Position of the Employee and Type of Task. Organizations that talked about Position (interviewees Ana, Ester, Marina and Marina Luisa) usually pointed to managers and coordinators. However, one of these organizations highlighted that “the higher the position, the more you had to be physically in the company” (AC, line 41), which can be considered an exception in regards to analyzing the other interviews. Regarding the Type of Task criterion, it was equally four times mentioned by the interviewees André, Ester, Marina Luisa and Paulinho; and here teleworking happened according to different tasks: (a) the employee was more likely to have to be at the client’s side (AM, line 63); (b) the employee would have to work on a specific project, which the work had to be done at a specific time of the day (EZ, line 49); (c) the technology team, since they already usually focus on online communication and teleworking tools (EZ, line 116); (d) the employee had a direct relationship with employees from other branches(ML2, line 33); and lastly, (e) the work performed by the employee was complex and required high concentration (PR, line 109).

The Department criterion was mentioned three times, by Dion, Florian and Paulinho; as being departments which had contact with other countries, and therefore, had to work with online communication tools or during different times (DC, line 49); or departments whose manager was more opened to the idea of telecommuting(PR, line 54). One interviewee (Florian) mentioned that, in his company, the technology department was most likely not to telecommute, because they required specific software or computers that would only be available in the company (FW, line 79).

The home location of certain employees was also mentioned as a criterion by Florian, as they lived far away from the organization and needed, therefore, to use online communication to maintain contact (FW, line 58). Experience was a criterion mentioned by Paulinho, meaning that an employee who is more experienced, might be more responsible and therefore, more suitable to telecommuting (PR, line 136). In an international organization (from Florian), being a foreign employee was also a factor for focusing on telework, as they often had the wish to visit their home country and relatives, but still needed to work (FW, line 50).

Lastly, some companies also mentioned that there were no criteria for selecting the teleworkers. However, two of these companies (Florian's and Paulinho's) mentioned some kind of criteria at some other point of the interview. Perhaps these interviewees did not consider them as criteria, but the criteria "Foreign Employee", "Department", "Experience" and "Type of Task" were mentioned in these cases.

4.2.2 Situations when Telecommuting cannot/should not be Applied

Aiming to answer the question "*For the situations when communication cannot substitute mobility, what might be missing?*" the interviewees were asked about the situations in which telecommuting is absolutely not recommended. The answers for this question will provide clues of what might be missing in order for online communication to be a substitute for traffic and mobility.

The most mentioned situation (five times) by the participants André, Dion, Ester, Marina and Paulinho) was when there is a need for face-to-face communication. Organizations appear to have the opinion that, when closing an important deal or talking with a potential client, the meetings had to be face-to-face. The other situation was when there were many people attending a conference, and there is a high level of difficulty if a large group of people are talking through a video chat (AM, line 115). Ester mentioned twice during the interview that, being a communication professional as she is, there is a need to sit together, brainstorm and talk about projects (EZ, lines 62 and 122). The coordinator for a big automotive company, Marina, highlighted that they would always choose to work face-to-face, and would only telecommute if the person who they needed to talk to was not close to them (ML, line 101).

Another problem that was mentioned is when the employee does not have a telecommuter profile. Both André and Florian appeared to make a distinction between people that are able to concentrate and work responsibly by themselves, and people that are usually fostered to work only

if they are around others, or in a working environment, in this case, the company (AM, line 70; FW, line 120).

The participant André recited worries about feelings of isolation from the teleworker. He mentioned this problem twice during the interview and, highlighted the importance of being around others, but also the concern about a telecommuter not being able to have good communication skills, when he or she is only working alone. In his words “they (the clients) don't want to have a nerd on the other side of the phone, they want to have a human being, and so it is important to have, time by time, the chance to be together with colleagues and have some social contact.” (AM, line 144).

The same interviewee reported concerns about distractions when having a conference call, stating that an employee has the chance to minimize the screen and pay attention to something else during, for example, an important meeting (AM, line 123).

When facing this question, the CEO of an international company Florian mentioned that it is not recommended to telecommute when an employee needs a specific software or computer in order to work, since usually such tools are only available on the company's site (FW, line 37).

Interestingly, Marina Luisa recited that her organization would only recommend an employee to telecommute if it was absolutely necessary, so all the other options would simply not be recommended (ML2, line 51).

Lastly, two organizations (Fabiola's and Marina Lotfi's) were of the opinion that telecommuting is recommended in all situations, as the tools used had no restrictions. However, the same company that had this opinion (Marina Lotfi's) mentioned the need for a face-to-face communication at some point of the interview.

4.2.3 Online Communication actually fostering mobility

One of the main advantages of focusing on telecommuting is the possibility of decreasing mobility and therefore, pollution and traffic jam, as previously mentioned in this paper. Nevertheless, there is a concern if it is somehow possible that the practice could actually foster mobility, as presented in the research question “*Are there situations when communication actually fosters mobility?*”

When facing this question during the interviews, most participants had a hard time understanding this concept at first, and secondly thinking of a situation that fits. However, it was mostly mentioned that, when having a home office, some employees would end up solving personal

problems or driving to other places, as they did not have a fixed work time. Both Ester and Paulinho, who stated this problem, said that, in such home office days, telecommuters could use this opportunity to go to the gym, or the doctor, among other places (EZ, line 103; PR, line 179).

Marina Luisa, who works in a big organization, mentioned that the number of trips that the managers took increased since last year, because of the telecommuting tools (ML2, line 80).

Nevertheless, most of the participants (four of them) stated that they did not believe there was a situation in which telecommuting would foster mobility. One of them simply said that this might occur in a big city with a high volume of traffic jams, but he did not believe that this would happen in Ilmenau, the city he works in (FW, line 134).

4.2.4 Aims, Advantages and Achievements of Telecommuting

Searching for the answer to the questions “*What are the reasons for these developments, which brought organizations to utilize communication rather than physical traffic? Is this desirable for employers? Why?*”, the interviewees were mostly asked about (a) the aims of telecommuting in their company, (b) the biggest advantages that the practice bring to them and (c) the achievements that were possible because of this form of mobile work.

4.2.4.1 The Aims of Telecommuting

Most answers to this question were cited almost the same amount of times, which shows a balance of opinions when the aims of telecommuting are concerned.

Firstly, the aim of communicating with other branches were mentioned three times, by Dion, Fabiola and Marina Luisa, as the organizations they work for have branches in different places of Brazil, or even outside the country. The answer given by Fabiola was simply “integration”; however, it was possible to connect this response to communication with other branches when reading the whole interview. Nevertheless, she also talked about integration with suppliers and clients.

Reduction of costs was stated by Dion, Fabiola and Marina Luisa, which referred to costs related to trips, as they had to maintain a close communication with employees from other locations.

The aim to meet demands was mentioned by Johannes, who meant that employees would be able to obtain results even if not physically at the company (JW, line 29); and Marina Luisa, who highlighted the need to follow specific guidelines in different places of the country (ML2, line 38), which was possible because of teleworking.

The fourth most mentioned aim was to offer the best to the company's clients, as cited by André and Dion. André highlighted that teleworking was mostly forced by the clients, since some employees had to perform 30% of their work at the client's side (AM, line 74). Dion simply mentioned that the aim is to maintain relationships (DC, line 53), which is connected to the aim of offering the best to the company's clients because of the other parts of the interview.

Both Marina and Marina Luisa mentioned "to shorten distance" as a goal when applying telecommuting, as they work in big companies that have many branches all over the country.

The goal of obtaining more agility was expressed by both Dion and Fabiola, who meant that telecommuting could speed up business processes (DC, line 53).

Information flow is said to be a great part of telecommuting. Dion and Marina Luisa mentioned this goal as facilitating the traffic of information.

Since she was working for an older and more formal company, Ana stated that that are no aims to telecommute. As she says *"I think teleworking was more connected to this technology culture, or if it would not be such a formal company. The organizational culture would have to be very different to accept this kind of innovation."* (AC, line 49)

4.2.4.2 The Greatest Advantages of Telecommuting

A great amount of the answers concerning the advantages of telecommuting are similar to the answers concerning the aims of telecommuting. Nonetheless, there is a distinction here, since the aims reflect what the companies desire to achieve, and the advantages are the positive points they see when telecommuting is concerned.

Even when asked about the greatest advantages of teleworking specifically for the company, the most given answer was "Life Quality for Employees". This answer, besides being mentioned by seven participants, was articulated two or three times during the same interview, as seen in the cases of André and Paulinho. The participants focused on the fact that, when working at home, employees will be able to spend more quality time with their family (AM, line 87), get rid of traffic jam stress

(ML, line 197) and have a happier life (FW, line 247), which reflects positively on the organization. Using André's words, *“and they are more motivated because, their choice is to work at home and they are allowed to do it, they are more motivated, and so the company just wins.”* (AM, line 106).

The second most answered factor was the reduction of costs, mostly because of travelling, as cited by Dion, Fabiola, Marina and Marina Luisa. All of them work for companies which have business with clients in different countries or states, or they have branches in different locations of the country. The other reasons given were simply that telecommuting reduced company costs and bills .

In third place, the client factor appears. As mentioned as an aim of telecommuting, the possibility of staying in touch with clients via teleworking tools seems to be of great importance to these organizations. Most participants implied that the use of telecommuting was positive for the company when contacting the client; nevertheless, André's company seemed to have this aspect not only as a positive factor, but a requirement in their business, as they have to be present by the client's side (AM, line 288).

To stay in touch with other branches was another great advantage, as spoken by Dion, Fabiola and Marina Luisa. Fabiola simply used the word “interaction” as an advantage, but the researcher could connect the answer with other branches due to what was said during the rest of the interview.

Telecommuting also appears to offer the environment for a higher concentration of employees, which benefits the organizations. The factor, mentioned by André and Ester, seemed to be important, especially for jobs that require more concentration such as technological tasks (EZ, line 71).

The participants Florian and Marina highlighted the possibility of always staying connected when teleworking. Both interviewees talked about checking emails or solving small problems while driving back home or travelling (FW, line 122; ML, line 110).

The possibility to shorten geographical distances and to travel less was also mentioned twice, but in this scenario, the focus was not on finance, as mentioned before. This factor was counted more on the time consuming aspect of having to travel when the need to meet a client (AM, line 202) or when an employee from another branch needs information (ML2, line 120).

As mentioned in the “aims of telecommuting” answers, agility also plays a strong role in organizations, when employees telework. Both Dion and Fabiola spoke about this factor as speeding up processes.

Also cited twice, the possibility of reduction of the office space was highlighted by André and Ester, in situations when employees have home offices.

The other advantages of telecommuting, which were mentioned only once, were “flexibility for employees”, “contribution to society's welfare”, “less absence”, “productivity”, “increase profit” and finally, “advantages when hiring employees”. This last one, as spoken by Marina Luisa, was meant in the sense of having a broader choice of professionals to hire, in case they would live in different regions of the country (ML2, line 72). The possibility to increase profits was brought up by Johanness, which meant in a more ideological sense. In his own words, “*Any company that gets rid of the traditional ways of working in order to comply with its specific demands in an efficient way has good chances to find a way to increase profit, productivity and a higher satisfaction for the employees and managers.*” (JW, line 51). Interestingly, the contribution to society's welfare showed to also be a concern for organizations, as Paulinho mentioned, as being the second biggest advantage for the company he works for (PR, line 273).

4.2.4.3 Organizations' Achievements Brought by Telecommuting

On a different level as aims or advantages, the participants were also questioned about the achievements that were possible because of telecommuting, for the organizations. Here, the researcher considered more tangible factors, such as the results when addressing demands is concerned, and results of efficiency, among others.

The most mentioned factor was to address demands with excellence, cited by four organizations. André presented this factor with a focus on the customer, saying that telecommuters were able to reach the customers' needs (AM, line 188). However, this factor was also considered as meeting demands with excellence, since, more than reaching the clients, it was a requirement for the employees to be at the customers' side, and teleworking brought them to deliver a more excellent job when performing the practice. As many of Ester's tasks were to follow real time events on Social Media, she mentioned that telecommuting brought employees to deliver and perform some real time tasks with perfection (EZ, lines 90 and 186). As mentioned by Marina Luisa regarding the company she works for, mobile working allowed employees from different regions of the country to

receive the same information and follow the guidelines properly (ML2, lines 72 and 120), which culminated on addressing the company's demands with excellence as well. Finally, Paulinho spoke about a tool that allowed customers to visualize almost as well as personally, properties that they were interested in (PR, line 158). Therefore, the researcher also considered such situations as assisting the requests with perfection.

The possibility to shorten distance was the second most mentioned achievement, as cited by Marina, Marina Luisa and Paulinho. In this case, all of them spoke about being able to transcend the long distances between employees or clients, and communicate all the needed information even to those that were in other regions or even in other countries.

The participants Fabiola and Paulinho addressed the important achievement when reaching clients is concerned. Paulinho even mentioned that the internet was a great channel to bring prospective customers to acquire the companies' services (PR, line 120).

Two other mentioned achievements by André, were to magnify the efficiency and the motivation of the company's employees.

4.2.5 The Biggest Challenges of Telecommuting within Organizations

With the purpose of understanding the many aspects of teleworking, the research question “*What are the biggest challenges of telecommuting within organizations?*” was created. To offer a better understanding of the challenges, this part will be divided in (a) obstacles of telecommuting, (b) missing factors when telecommuting and (c) problems and advantages of telecommuting, following the guideline created for the accomplishment of the interviews.

4.2.5.1 Obstacles of Telecommuting within Organizations

When facing the question about the obstacles of mobile work, the most mentioned one was technology. Although technology makes the practice possible, it can also create problems, as described by André, Marina and Marisa Luisa. The technology subject will be approached within the next parts of this chapter; however, the participants spoke about it being an obstacle specially when it comes to glitches, malfunction and difficulty when communicating with others (AM, line 132; ML, line 98). In the case of Marina Luisa, she cited the bad internet connection offered by the organization, which led to obstacles when teleworking (ML2, line 60).

As acknowledged by Dion, Fabiola and Paulinho, the need for physical contact is also an obstacle of mobile work. Both interviewees seem to see the practice as complementary to the face-to-face form of work, and they spoke about the need for physical contact for the integration of employees (DC, line 106; FB, line 51; PR, line 145).

Interestingly, two participants talked about the organizational culture being an obstacle for telecommuting. Ana and Marina talked about their perspective companies not applying the concept of telecommuting simply because the organization had a more conservative culture, and were often not open to such changes (AC, lines 69, 117, 127; ML, line 82).

Although it was only mentioned by Florian, the lack of access was also an obstacle of telework. He cited problems when his organization's employees were working at home but did not have a specific password or access a platform or email, which made their work difficult to accomplish at the time (FW, line 86).

Lastly, the participant Ester mentioned that there was no obstacle of telecommuting in her opinion. She highlighted that, since they would telework only sometimes, the process used to flow naturally (EZ, line 60).

4.2.5.2 What is missing, when telecommuting is concerned?

Part of analyzing the challenges of telecommuting, was to obtain answers regarding what is missing when applying this practice. However, it was remarkable that only one interviewee offered a response to this question. Ana brought up the need for the creation of policies when organizations aim to telework. She highlights that, if her organization would have policies and rules about telecommuting, it would be easier to apply the practice and it would not disturb the everyday life of the company (AC, line 107).

4.2.5.3 Problems and Disadvantages of Telecommuting

As expected, the most mentioned problem of telecommuting was the management of the telecommuter. Ester, Florian and Paulinho explained how hard it is not being able to control or closely follow what the employee is doing, when he is not working at the company. Nevertheless, Paulinho highlights the possibility of creating a system to measure someone's performance, which would solve this problem within organizations (PR, line 147).

Lack of regulation was a concern expressed by Ana, who mentioned that, if there is no proper regulation of telecommuting in companies, a problem might occur and the organization will have a hard time defending itself (AC, line 112). This factor should be taken into consideration, since it might be a big problem for companies.

Distractions were also considered as a problem, which was expressed by Paulinho. He says that, even though telecommuting can create a better environment for concentration, it can also bring distractions that would not appear in an office environment, such as TV, or a pet, among others. The participant justifies this answer saying that, psychologically speaking, someone's home is a place for relaxation, and the employee might have the feeling that being there is a time of leisure (PR, line 131).

André expressed his worries when the employee's development is concerned. He mentions that, when working at home, an employee might not have the same possibilities to communicate and develop certain skills that would be important at work (AM, line 137).

Another disadvantage cited by one of the participants (DC, line 68) was that teleworking might require more commitment and clarity from the professional, when it comes to processes and punctuality. Following the same path, Johannes cited the difficulty in finding employees that are adapted to this dynamic of work; although he didn't consider that any aspect of telecommuting brings disadvantages to the company (JW, line 42).

As Ester mentioned before, there was a need for work outside normal working hours, especially during weekends or in the evening. This aspect was considered as a disadvantage in her opinion, as many employees expressed complaints regarding this problem (EZ, line 69).

Finally, three interviewees stated that there were no problems or disadvantages of telecommuting, and that the practice worked fine when an arrangement between them and their employees was made. However, they still mentioned problems regarding the practice during other moments of the interviews, which could mean that, even though there were concerns when an employee would telework, they would not be so great that would stop the practice in the organization. Ana, Ester and Johannes were the three participants who mentioned that no problems were existent.

4.2.6 Organizational Strategies and Efforts Directed to Telecommuting

For the researcher, it was also important to understand what exactly the companies are doing to regulate and stimulate the practice of teleworking. Therefore, the research question "*What are the*

efforts from the organizations, when creating strategies to stimulate and organize telecommuting?” was created.

Most of the organizations that were interviewed explained that there were no strategies concerning these aspects, which can show a lack of effort when deciding to apply the concept of telework.

Two participants, Marina and Marina Luisa, talked about a type of training that was offered by their respective organizations, when employees would telecommute. They mentioned that the companies would explain how to use the telecommuting tools and offer a short training for the employees.

Florian stated that he would give advices to teleworkers at his company, regarding what can be done when telecommuting. He also said that he would have a short talk with the employees, who would telework. In this short talk, he mentions some rules, makes sure that the telecommuter has all the passwords and finally asks them to keep him informed about the most important subjects, since the work will not be followed closely when someone is working from a home office (FW, line 101).

4.2.7 The Technological Side of Telecommuting

As seen in the State of Research chapter of this thesis, technology is the key to telecommuting. Therefore, in order to understand how online communication can be a substitute for traffic in organizations, it is of great importance to also question and comprehend the technology department and its role within companies. This part, is intended to answer the research questions “What is the role of technology when telecommuting? Is technology ever an obstacle when adopting this practice?”

The IT department of various companies seemed to have some differences, however, six of them showed to invest in technology and they have a big IT Team. Dion stated that his company even had stations and equipment for telecommuting inside the company, besides the technical support when needed. Although the other companies did not have such telecommuting stations, they often have a big IT team that give technical support regarding different problems and telecommuting. Three other companies expressed that the technology team was not so evolved and present in their everyday life. These companies mostly only had one developing and programming team, but no technical support (as stated by Ester and Florian). Lastly, Johannes explained that,

although the organization that he works for has no IT team, they hired technology services from another company, in case they needed support.

Most of the interviewees explained that the IT team was there whenever an employee needed to telecommute, in order to help with questions and solve problems. Besides helping with technical problems or questions, the IT team would also fix machines whenever it was needed. Nevertheless, the participants did not explore this idea seriously.

When asked if the organization offered the necessary equipment to telework, five participants stated that yes, the companies would offer notebooks, telecommuting equipment and in one case, they even offered a mobile phone. Four other interviewees said that the organizations did not provide such material and that it was assumed that the telecommuter would have what was needed at home. In another case, the interviewee explained that they would offer the equipment only in case of a working trip with the company, or if the telecommuter would need some specific machine or software (FW, line 168).

Another important aspect of technology when telecommuting is which tools and networks are used, so that the employees have access to everything they would normally use when being physically at the company's office. When asked about such tools, André and Paulinho mentioned using a VPN when teleworking, which is a tool that allows employees to have access to all files using a login and password. Most of participants only mentioned using tools like Skype, and Dropbox, among others, while Ester stated that she could have access only to some files when telecommuting, which she would access using a USB stick. Therefore, most companies offered diverse tools for online communication, but not many of them really gave access to all the files that are existent in the organizations' systems, which would otherwise be able to be accessed from the employees.

The participants were also asked if there was anything missing, when technology is concerned. Most of them stated that they had everything they needed to telecommute, especially with the formats that they use. The only negative answer was from Marina Luisa, who said that internet connection speed was something that needed to be improved.

As expected, the participants demonstrated to have some concerns regarding technology and telecommuting. The most mentioned answer was, as said before, that technology and mobile working is not always a good substitute, since there is a need for physical contact in some situations. Ester and Paulinho expressed that there were some concerns regarding security at their work, as companies are afraid that some information might leak when employees are working at

another location (EZ, line 137; PR, line 224). Other cited obstacles were the bad implementation of some tools, the bad connection speed and the fact that some employees did not have the knowledge of how to use a specific tool, and it took some time for them to learn.

When asked about extra expenses of telecommuting for the IT department, all answers that were given expressed that there were no extra expenses, because they were considered as investments in technology, or because they were already forecasted as a regular and needed expense for the company.

4.2.8 Political Decisions to Foster Telecommuting

As presented within the theoretical part, support for telecommuting that comes from the government can make a big beneficial change in society and the environment. Hence, it is also important to understand the existence of laws, regulations or decisions that stimulate organizations when adopting telecommuting as a form of work, aiming to answer the questions *“When considering politics, is it beneficial to stimulate telecommuting in organizations? In other words, are there any laws (e.g. taxes) or political decisions that foster telecommuting?”* and *“Which political decisions (that have not been accomplished yet) would be helpful in order to induce organizations and businesses to apply telecommuting?”*

4.2.8.1 Existent Political Decisions Regarding Telecommuting

The participants were asked if they knew about any political decisions or laws, which stimulated companies to apply the telecommuting model of work, and if they took some benefit from them. In a nutshell, five interviewees affirmed having no knowledge of such incentives. Florian added that he would only see these governmental actions to be possible, when telecommuting would be regulated within companies, and not a practice that occurs only occasionally.

Other interviewees mentioned not having knowledge of any laws or incentives that would affect telecommuting in companies, however, they offered some other examples which they thought were similar to such case. André, talking about a benefit for the employee, explained that in Germany, employees that have to drive to their companies to work can present the number of kilometers traveled per year, and then receive discounts when paying taxes (AM, line 257).

Ester stated that, although she did not know of any company that took advantage of such incentives, she is aware that the government promotes and launches campaigns in order to stimulate telecommuting within organizations (EZ, line 169).

Finally, Marina and Paulinho both mentioned that, because of lack of rain in Sao Paulo, the government is giving a discount on the monthly water bill, in case the company or person consumes less water than the average during the month. The discount is proportional to the amount of water that is “saved”, so if someone consumes 30% less water than usual during the month, he or she will receive 30% discount on the final bill (PR, line 249; ML, line 181).

4.2.8.2 Political Decisions to Stimulate Telecommuting in the Future

The interviewees were also asked which political decisions regarding telecommuting they would consider to be important in the future. For these questions, only three participants gave an answer. Dion mentioned “*Telework could be considered as a politic of life quality for the employees. Any effort that brings such topic would be an incentive for companies to consider telecommuting.*” (DC, line 123).

On the other hand, Fabiola spoke about the need of having a set of policies, in order to understand the duties and rights of the employee. She also believes that it is important to have support for the company, since setting up a home office environment for the employee will also incur expenses, and finally, she mentioned the need for a form of productivity evaluation, so that the employers could effectively manage the employee’s work (FB, line 101).

Johannes stated that a visionary leadership is necessary to promote this kind of work, however, when such leadership fails, tax incentives will be strong arguments to those that lack such vision (JW, line 99).

4.2.8.3 Would Political Decisions be a Strong Factor for the Adoption of Telecommuting?

When facing this question, the answers were basically divided. Four interviewees affirmed that this would not be a strong factor for their companies to adopt telecommuting, whereas three participants said that it would definitely help by stimulating this form of work.

Analyzing the negative answers, André and Florian said that teleworking should be more decisions between the employers and the employees, and that they do not see a need for the government to focus on such incentives (AM, line 268; FW, line 208). Marina Luisa and Paulinho believe that such stimulus would be positive, however, they would not be such a determinant factor for their companies.

On the other hand, Ana, Ester and Marina stated that they believe in such incentives, and that their companies would be more likely to adopt mobile working because of them. Ana stated that such stimulus makes it easier for companies to make a change (AC, line 91), while Ester said she believes that many communication agencies would be also able to benefit from it (EZ, line 180). Finally, Marina highlighted that Toyota would be more prone to adopt telecommuting in such case, since it is a friendly company (ML, line 190).

5 Discussion

This thesis, along with its findings, possibly enriched the knowledge of different perspectives of telecommuting within organizations. As previously mentioned, telecommuting is a practice that brings a variety of benefits to society and the environment. Therefore, it is of great importance to comprehend it, in order to foster the practice in many work environments. And because companies are the deciders when teleworking is concerned, it is extremely advantageous to hold the necessary knowledge to stimulate and persuade employers to adopt telecommuting. Hence, this chapter is intended to discuss the results and answers to the main research question *“How can online communication and telecommuting be a substitute to traffic in organizations?”*

Despite the different studies about the practice of telecommuting available, it is possible to observe that some results found in this thesis are still contrasting to others that were previously found. In a nutshell, telecommuting appears to be a practice which comes from a necessity within companies, rather than being a practice which an organization decides to adopt for the good of society or the environment. This last situation happens as a consequence of the many advantages of mobile working.

The first part of the research was to understand the practice of telecommuting in companies. As seen within the State of Research section, mobile work can happen during some days a week or on a permanent basis. Most of the participants, when talking about the frequency of teleworking, mentioned that teleworkers mostly apply this practice almost daily or twice a week. Nevertheless, one organization said employees only telecommute sometimes, in an irregular frequency. It is also noticeable that the number of telecommuters within companies varies from 10% to 50%, usually being the highest positions or the sales and IT departments. Such facts can be connected to the literature coming from Nilles (1998), who came up with different tasks that are more suitable for telecommuting, and the ones that are not suitable usually because of a need to interact face-to-face. It is also remarkable, how some companies mentioned the sales department as the one that telecommutes more often, but on the other hand, sales employees are often the ones to need face-to-face interactions often, usually when closing important deals or when communicating with new clients (also spoken by the participants).

The usage of telecommuting comes in different forms. Participants of the present study stated that the practice is often applied (1) to reach the clients, supplier or employees from other

branches, (2) to perform extra working hours or work outside the normal office time, (3) because employees preferred to work from home or (4) to be able to travel and still fulfill the work tasks. Telecommuting also seems to occur usually with managers, salesmen (to keep in touch with clients) and the IT team, because the advantage of technology. Interviewees also stated that the most used teleworking tools are Skype, followed by Email, Dropbox, Home Office and Telephone. Some other less frequent used tools are also mentioned, such as Team Fuel, Face Time, WhatsApp, Google Hangout and Facebook. This can perhaps show that, rather than installing high quality telecommuting tools, teleworkers tend to use the easiest and cheapest tools available, which points out once again that the practice of teleworking comes more from a necessity than a strategic plan to implement it.

The criteria used by employers to select telecommuters are also an important topic for this thesis, as it provides knowledge about the situations when telecommuting can be more or less utilized. Participants mentioned the Position of the Employee as the most used criterion, and in this case, mostly the higher positions telework. The Type of Task is another important criterion, since it is more likely to be influenced by aspects such as the need to maintain contact with clients or with other branches, projects that need to be worked on during non-office hours, technology, and need for high concentration. The Department was also a criterion, since it is said that the ability to telework usually depends on the manager of the department. In one case, the interviewee highlighted that the IT department is not likely to telecommute, as they need specific tools that are only available at the company's site, however, this can be considered as an exception. Home location is also a criterion, and it goes along with the study brought up by Mokhtarian and Salomon (1997), who explained the great advantage of telecommuting when relocation from home is concerned. Experience was also noted by the participants as a criterion, which is followed because telecommuters need to be responsible and be more experienced, as interviewees say. Such finding can be explained by the research presented here, which stresses the difficulty in managing a telecommuter as a disadvantage for companies. Lastly, some participants reported no criteria for selecting teleworkers, although they mentioned some other criteria at some other moment of the interview. Perchance this demonstrates that companies have no official criteria, although there are existent informal criteria for the telecommuters' assortment.

Moving on to the next part, now the aim is to answer the question *“For the situations when communication cannot substitute mobility, what might be missing?”* with the findings about situations when telecommuting is not recommended. The need for face-to-face communication is

highly mentioned and it can be hard to find a solution. Participants seem to have the opinion that, when closing an important deal, it is important to be physically in the same place, as when a conference with many participants will take place. This result strongly points out to the Media Richness Theory. Although telecommuting is often used to communicate with others, it is possible to observe that some interaction aspects are still not fully covered by online communication, as defended in the Media Richness Theory. Some interviewees also justified such opinions with poor internet connection, which can be a big obstacle when discussing important topics. In this case, the incorporation of better technology can be advised for telecommuting to be more frequently applied in companies. However, one of the participants stated that, as a communication professional, there are some situations when there is a need to sit together and brainstorm. A participant expressed that she would mostly choose face-to-face communication, and would only telecommute if it was needed. As she works in a big and more conservative company, this could possibly be changed if there were strong campaigns and stimulus showing the many advantages of telecommuting that fit with organizational interests. However, the theory presented by Mayo, Pastor, Gomez-Mejia and Cruz (2009) about big companies being less likely to apply telecommuting, can be confirmed. The fact that some employees do not have a telecommuter profile is also mentioned as a situation when telecommuting does not apply. However, as it will be discussed below, there is rarely any effort from companies to train or stimulate telecommuters. So far there are no found studies concerning the psychological profile of telecommuters, but more encouragement and trainings from the employers might be sufficient to meliorate such situations in the work environment.

Feelings of isolation are also problems that are cited as a concern. The interviewer not only worries about the isolation feelings that telecommuting can bring, but also that the employee might not have the opportunity to develop strong communication skills. Both problems seem to be present in many studies; therefore it is also confirmed by this present one. Also assessed in literature, are the concerns of distraction in a telecommuting environment, since it can decrease productivity.

In organizations where telecommuting is not highly recommended, interviewees spoke once again about the fact that employees only telecommute in their company if it is absolutely necessary. These results point out to a necessity of stimulus and trainings that should be offered for employees, in order to boost the usage of online communication and decrease the traffic. A focus on telecommuting technology may also be an important key to improve this situation in organizations. On the other hand, some companies state that there are no situations in which it is not recommended to telecommute, at least with the tools that they use.

When the research question, “*Are there situations when communication actually fosters mobility?*” is concerned, most of the results seem to validate the view that telecommuters are not likely to increase mobility and traffic congestion (Walls and Safirova 2004). Nonetheless, there were still those that take care of personal issues when a fixed working time is not required, as for example when practicing home office. As mentioned by some interviewees, this can cause mobility to increase, since telecommuters mostly use their cars to reach their destination when solving a personal problem. Also, one participant expressed that when telecommuting, many employees are able to travel to other locations and still keep up the work, which increases mobility as well. However, such situations are viewed as exceptions, therefore it can be concluded that telecommuting is still a powerful tool to decrease mobility and traffic congestion, rather than increasing them.

The findings concerning the questions “*What are the reasons for these developments, which brought organizations to utilize communication rather than physical traffic? Is this desirable for employers? Why?*” serve to understand the advantages and achievements of telecommuting that are perceived by organizations, which allow the exploration of new ways to meliorate and foster the practice within companies. The data gathered shows that the aims of companies when telecommuting are (1) to reach employees from other branches, suppliers or clients, (2) to reduce costs (related to travelling), (3) to address specific demands, (4) to shorten distance, (5) to increase agility and (6) to improve information flow. Such aims may suggest once more, that employers tend to adopt telecommuting when it is mostly needed, since there are no aims concerning the improvement of others’ life quality or societal/environmental aspects. This fact can perhaps show a lack of interest of organizations when other parts are concerned, however, life quality for employees was the most cited advantage of mobile work, not only by the number of participants, but also the number of times in which such advantage was mentioned. It is believed that, if employees have a better quality of life, they will consequently have higher motivation and work better for the company, which goes along with the study that demonstrates that higher quality of work associated with telecommuting is the most mentioned benefit for organizations (Alvi and McIntyre, 1993), besides other research results that demonstrate that employees are happier when teleworking.

The findings regarding reduction of costs also reinforce theories which express this aspect as a great benefit for organizations, although here there is a difference. Most of studies focus on a decrease of costs when parking, energy and office space is concerned, whereas in the present research, participants refer to reduction of costs only related to travelling. Only in one case a

participant mentioned “reduction of office space” as an advantage, but the researcher does not connect such aspect to reduction of costs, as the interviewee explained that employees were only asked to work from home for this reason when the office was under reform to augment its size. Therefore, it is possible that companies do not hold knowledge about the reduction of expenses (besides travel expenses) when employees telecommute, which could be easily solved by informing organizations about the past telecommuting cost reductions research that was accomplished. Nevertheless, this finding is seen as extremely positive, since the participants often mentioned the decrease of travelling when telecommuting.

Also explored within the “advantage” question, participants see maintaining contact with clients and with employees from other branches through online communication as strong advantages, which appear to be a decisive factor for these organizations. Such an advantage can be connected to the possibility of diminishing geographical distance, which was also cited by some participants. Also, the practice of telecommuting seems to greatly enrich relationships between companies and their customers. This gives more support for the claim that such possibility is one of the greatest advantages of telecommuting from the organizational perspective.

Telecommuting also appears to create a quality environment for higher concentration of the employees, as mentioned by some participants. This aspect can be connected to productivity, which was also cited in the present research, and that is one of the most commented advantages in different studies about telework. Nonetheless, another interviewee also mentioned that there could be a decrease in concentration when an employee is working from home, as will further be explored below. An argument in favor of higher productivity when telecommuting is that the employee tends to work when his or her creativity is boosted, since telecommuters have better flexibility to choose their working time. Besides that, mobile work is often seen as a reward from the company, which can serve as a productivity boost for employees.

Although not explored in literature, participants consider the possibility of always staying connected as a great advantage for companies, since telecommuters can often check emails and perform some work tasks when stuck in a traffic jam or arriving at home. Such aspect can certainly be a plus, but it can also cause problems if the employee has the tendency to work too much, which can cause an increase in stress, as mentioned in literature as a considerable problem of telecommuting.

Also seen in the literature part, higher flexibility, less absence of employees and advantages when hiring them were also cited by the participants of the present research. Such information only reinforces that these aspects are beneficial for companies, and perhaps the government or other parts, which are interested in fostering telecommuting, should utilize these features to attract organizations to this form of work. “Contribution to Society’s Welfare” was also addressed by a company. This finding can create a link to literature, when it was emphasized that companies could use such aspect to create a good image for the public. Lastly, the possibility to increase profit was mentioned in a more ideological way (the interviewee stated that companies could increase profit with telecommuting), but it is still known and proved by studies that companies that adopt digital work tend to obtain higher profits than usual.

Achievements brought by telecommuting were also investigated in order to understand the reasons why companies adopt the practice. Also present within the aims of telework, “to address demands with excellence” was an achievement cited as one of the most important achievements in this thesis. Since it is considered as an achievement, it is arguable that, more than just an idealization concerning telecommuting, such an aspect is a positive aim that can be counted as reached by organizations. Besides going along with the advantage of better interaction with clients, this achievement was considered as extremely important, as many highly essential tasks could only be accomplished with mobile work, such as the follow up of events, guidelines, and the possibility to close more deals. This aspect was not exactly mentioned within other research; however, it can be connected to other cited ones, like increased profits and higher quality of work.

The participants of the present study also consider the possibility to shorten distance as a great achievement, besides being an advantage. One interviewee highlighted this aspect when contacting international branches of the organization, which relates to the theory that international companies are more likely to telecommute. They have also mentioned that the practice of telework magnified the efficiency of employees and brought higher motivation for them, which could both be seen within other studies which results were that telecommuting reinforces the relationship with the organization (connected to motivation), that it made employees happier and finally, the higher productivity/quality of work possible because of the practice of mobile work.

In order to understand the negative aspects of the practice of mobile work within companies and to answer the question “*What are the biggest challenges of telecommuting within organizations?*” the guideline approached obstacles, what is missing when telecommuting and disadvantages of adopting this kind of work. Commencing with the obstacles, the technology is

often viewed as a barrier when employees need to utilize online communication to talk to each other or to clients. Participants basically mentioned technological problems such as malfunction, difficulty when transmitting information and poor internet connection, which made teleworking harder, forcing employees to meet personally at times. As the subject of technology will be further explored within the technology discussion part, other obstacles appear in focus at the moment. Also cited within the “when not to telecommute” part, interviewees consider the need for physical contact as an obstacle, and highlight that mobile work should be complementary to face-to-face work and it is not possible to telecommute all the time. Such finding was somehow expected due to the appearance of the Media Richness Theory in the second chapter, which emphasizes that online communication is not able to substitute face-to-face interactions, especially when the conversation carries important aspects such as informal talks and body language expressions. Perchance telecommuting, although a practice that brings many benefits, should be applied carefully within organizations and, as mentioned by the participants, as a complementary set of tools to the average face-to-face in-office work.

A very interesting obstacle that was stated by two interviewees was the organizational culture. Both participants highlighted the very conservative character of the companies they work for, and they view this as a big obstacle since it was keeping such positive practices to be present in the company. Regardless of the lack of literature approaching such obstacle concerning telecommuting, organizational culture is an aspect worth paying attention to, since it influences greatly the adoption of mobile work and it is seen as possible to be changed, perhaps with pro-telecommuting campaigns, among other efforts. However, since the two organizations that stated this obstacle are big and have many branches, once again the theory that big companies are less likely to adopt telecommuting is confirmed.

Lack of access to programs, emails or accounts is also seen as a difficulty when, for example, practicing home office. Finally, another participant also believes that there are no obstacles for the practice, because the process within the company she worked for flows naturally.

In spite of only obtaining one answer about missing factors when telecommuting, it is considered that this response can offer important insight concerning the main topic. One participant complained about the lack of policies and rules to organize and better apply the practice. At some other point in the same interview, the interviewee also mentioned that the company had the fear of suffering from any legal problems with telecommuters, as the practice is not regulated.

Moving towards the problems and disadvantages, the management of a telecommuter problem was found to be the most present among this study and among the literature. Participants consider it as a great problem, because, according to them, employers cannot make sure that the teleworker is complying with her or his tasks and there is no possibility to follow the telecommuter's work up closely. Nevertheless, the same participant who stated this problem, also suggested creating of a system that would help measure an employee's performance, which would eliminate this disadvantage.

Besides being mentioned as a missing factor for telecommuting, the same participant repeated the lack of regulation concerning the practice as a great problem for organizations, especially in case problems occur. It is evident that, if society is interested in fostering and stimulating online communication and telecommuting, it is necessary to better organize and regulate the practice, so that both employers and employees will feel comfortable and secure enough to engage in it.

Even though telecommuting is believed to decrease distractions that might come up when working in an office, both literature and this research mentions distractions at home to be an aspect worth considering. Mogelonsky (1995) highlighted within a study that family distractions at home could be quite negative as it decreases levels of productivity. The same problem is believed to be a concern for an employer who took part in this thesis. This disadvantage can be connected to another one that was mentioned by other participant, who believes that telecommuting requires a high level of commitment from the employee, regarding punctuality and processes. Nevertheless, it is believed that having the opportunity to telecommute is highly considered and even stimulating for employees, therefore it can be said that, on the other hand, teleworkers might have more motivation when comparing to other employees who only stay in the office.

Concerns about the telecommuter's development is also an important aspect for a participant of the present research, and it goes along with some disadvantages cited within the literature, i.e. a possible decrease in informal learning and mentoring (Cooper and Kurland, 2002). Such a finding, along with some others, can once again point out that telecommuting is a practice that should be accompanied with in-office work, with one always complementing the other.

Surprisingly, three participants believe that there are no disadvantages when a focus on online communication is concerned. However, they speak of problems in other moments of the

interview, which can mean that, although there are issues present within the practice, they are not considered to have great proportions or consequences.

Within the present thesis, there is also a need to comprehend *“What are the efforts from the organizations, when creating strategies to stimulate and organize telecommuting?”* in order to offer more precise suggestions for the practice. With the answers for this question, it is feasible to understand if the lack of incentives for telecommuting comes only from governmental parts, or also from the organizations themselves. Unfortunately, and as expected when reading the present literature by Jackson et. al. (2003), there is a lack of effort coming from most organizations that took part in this research, concerning mobile work. Nonetheless, some of them offer timely trainings, when the employers take the opportunity to explain how to use telecommuting tools, whereas another participant gives advice and has a short talk with prospective telecommuters, in order to discuss some rules and to make sure that the teleworker has all the necessary passwords and access. As approached by some scholars (i.e. Shafizadeh et. al. 1998), the researcher also sees a need for companies to invest in trainings and education concerning online communication, its tools and some forms of telework. This will not only stimulate managers and coordinators to adopt the practice, but also make sure that the telecommuting performance will be at its best.

Since it is basically the key to telecommute, technology is an aspect of great importance of this thesis. That is the reason behind the creation of the research question *“What is the role of technology when telecommuting? Is technology ever an obstacle when adopting this practice?”*

As expected, bigger companies have strong IT support, with a large number of IT employees, or the company had access to IT support from another company that was hired for this purpose. In two organizations that participated in the interviews, there was no existent IT support, but rather, a programming technology team, which also helped with some telecommuting problems. The IT team usually helps with all kinds of questions and problems with software and machines. When asked if their organizations offered the necessary equipment to telecommute, half of them stated yes, while the other half do not offer the equipment. Organizations do not seem to have the needed telecommuting structures at times, as some participants mentioned that, when telecommuting, they do not have access to all the files and tools that they usually have at the company's office. Some concerns are also part of the telecommuting routine of companies. Participants highlight the poor internet connection, bad implementation of tools, and lack of training on how to use specific tools and lastly, as approached also by the literature (Gray et. al., 1993), security concerns. Organizations seem to be avoiding the practice of telecommuting sometimes,

because they are afraid that confidential information will be leaked or be lost. On the positive side, organizations appear to be interested in investing in technology, as they see IT expenses as investments for the company, but not as extra because of telecommuting.

Although there are some obstacles when technology is concerned, they are not expected to affect deeply the practice of mobile work. As shown and highlighted by Jackson et. al. (2003), even with a lack of technological support from organizations, telecommuters were still able to work and often solve timely problems by themselves. Nevertheless, in order to create an even better environment for the practice, advances in the technological field of online communication are advised, especially when security and confidentiality is concerned.

The final research questions in the present thesis concern political decisions that have the power to encourage and motivate employers to adopt telecommuting practices within their organizations. Firstly, it was important to obtain the answers for the questions “*When considering politics, is it beneficial to stimulate telecommuting in organizations? In other words, are there any laws (e.g. taxes) or political decisions that foster telecommuting?*” in order to acquire a view of what is already existent. Recapping part of the literature present in this thesis, studies have shown that telecommuting can effectively reduce trips to the office, which translates into a cutback on VTM (Vehicle Miles Traveled), which can finally decrease the emission of organic gases, monoxide, nitrogen oxides and particulate matter (Kitamura et. al , 1996; Koenig et. al., 1996). Facing such benefits, governmental parts in the USA started to offer incentives for companies to telecommute more (i.e. tax incentives and credits, trainings, etc.) Nevertheless, all the participants of this thesis do not have any knowledge on these incentives, and affirm that there are no such stimuli in their country. One interviewee has already seen campaigns pro-telecommuting at times, and another two participants mentioned an incentive to decrease the usage of energy within private house holdings and companies, but it does not have a focus on mobile work.

It is equally important to understand if employers acknowledge the lack of such stimuli and if governmental incentives would be a decisive factor for organizations to adopt the practice of telework. When the research question “*Which political decisions (that have not been accomplished yet) would be helpful in order to induce organizations and businesses to apply telecommuting?*” is concerned, it is safe to say that the interviewees were divided. Some interviewees consider a set of policies and rules regarding telecommuting to be necessary, while one participant considers tax incentives to be a positive and strong factor when fostering the practice. Additionally, four experts that took part in this thesis affirm that such incentives would not be a decisive factor for their

company to adopt telecommuting, whereas three others view such stimuli as a very strong factor for their organizations to focus on online communication and decrease traffic.

In this study, different aspects of the practice of telecommuting and online communication within organizations were studied. Although not being possible to generalize the findings for all companies, the results show that telecommuting's presence is still very shy, and there is still much work to be done. Organizations appear to take advantage of mobile work mostly when strictly necessary or wanted by employees, however, employers do not seem to view telecommuting as a practice that should be adopted in order to meliorate nor the company itself, or the concerning traffic/environmental situation. As explored by the interviewees, face-to-face communication still seems to be needed in some situations, leading it therefore to conclude that online communication will never have the power to fully substitute physical interactions, although the advance of technological communication tools might make more space for the practice as it already has since the creation of the Media Richness Theory, which highlights the difficulties of online interactions within companies.

Furthermore, it is possible to conclude that the reasons behind the adoption of telecommuting in companies emerge from communication needs when clients and other branches are concerned, although there were answers focusing on reduction of expenses and office space, life quality and high concentration. Nonetheless, it appears that employers are not fully aware of the many other advantages of telecommuting, which could be used in order to stimulate this practice. The issue of challenges when telecommuting also appears to exist at times due to a lack of planning, training and organizing the practice. Such alternatives, when procured, could solve many problems when telecommuting, although some of the challenges (i.e. need for face-to-face interactions) will perchance remain as some negative aspects.

The findings also point out to the lack of organizational efforts to train and educate telecommuters. It is possible to conclude, with the given answers, that the absence of such efforts exists because employers view telecommuting as informal and only at times necessary. However, it is possible to observe that organizations are putting strong efforts into technology, which is an important step to foster online communication.

It is also clear that the issue of political decisions is very new to employers when telecommuting is concerned, and that some even do not find them very appealing when fostering the practice. Nevertheless, participants still strongly pointed out to a need for policies and

regulations. Perhaps, besides tax incentives or reductions, it is firstly necessary for governmental offices to organize, regulate and bring policies to create a safer and more reliable telecommuting environment for both employers and employees.

Attempting to answer the main question of this thesis, it is possible to affirm that there are many ways to substitute traffic and mobility for online communication and telecommuting, as it will be explored within the Suggestions and Recommendations section of this chapter. Nonetheless, as many organizations mentioned the importance of physical contact and face-to-face meetings, it is to conclude that the usage of online communication and telecommuting can and should grow, but it will always remain complementary to the average present work. It is advisable that each employer tries to foster the practice, but always trying to comprehend situations when it is needed for a face-to-face interaction. Furthermore, trust between employers and employees should be improved, since the management of the telecommuter showed to be a problem for the participants. There is a need for a focus on the final product, instead of the process, as also mentioned by Nilles (1995) within the Literature chapter.

Moreover, there were different findings within the present research that confirmed the theories presented in the first chapter. Firstly, even though there were many technological advances since the formulation of the Media Richness Theory, it is possible to observe that its main idea still applies. Most of the participants expressed concerns regarding online communication, always highlighting that it should be always complementary to face-to-face interactions, as the theory predicted. Another interesting point was regarding the organizations' characteristics which influenced in the adoption of telecommuting. As stated within the theory, smaller companies are indeed more likely to adopt telecommuting, as well as new practices. They seem to be more opened and less afraid to embrace novelty and new forms of work. Greater companies appear to have the problem of organizational culture, which creates a more conservative environment and more reluctant when accepting changes. Furthermore, as also forecasted by the theory, international companies were more likely to adopt digital work, since they need new communication forms to maintain contact with other countries.

Additionally, it is possible to observe that organizations do not appear to have the desire reduction of traffic within their main priorities. Companies seem to be applying the concept of telecommuting mainly to fulfill their own business expectations, such as reaching clients, facilitating communication between employees, reducing travelling expenses and bringing fast and agile solutions to the work flow. Hence it is to believe that, if campaigns and initiatives focus on

showing organizations the benefits of telecommuting according to their perspective and on efforts when meeting the companies' needs, the practice of telecommuting has a tendency to always grow, especially with the advance of technology and possible regulation and incentives from the government.

5.1 Suggestions and recommendations for the Practice of Telecommuting

With the acknowledgement of both the literature and the present research findings, it is possible to create a set of suggestions that might improve telecommuting within companies, and create better opportunities for the growth and rising of online communication at work.

It is remarkable that some participants brought up the problem of organizational culture as a great obstacle when adopting telecommuting. Perhaps older and bigger organizations are reluctant and at times averse to the idea of a stronger focus on online communication, as already predicted by Mayo, Pastor, Gomez-Mejia and Cruz (2009). It is suggested then that governmental campaigns would empirically approach the many benefits of telecommuting, such as productivity and the reduction of expenses. Telecommuting incentives such as tax reductions can be positively used for the purpose of influencing organizations regarding the subject, but more than that, it appears to be extremely important that a set of laws and policies to regulate telecommuting are created, so that both companies and their employees will feel comfortable and secure when adopting the practice.

For the organizational side, it is advisable that employers invest in trainings and education, which will create a safer telecommuting environment, as well as a steady understanding from the employee of different rules and recommendations when telecommuting. Additionally, since the management of the teleworker is considered a limitation for the field, organizations should perhaps work on different ways to measure the performance of employees or create a system to measure results effectively.

Technological advances are also needed for this field. Primarily, a better security system of data is required, so that employees can have access to all files needed to telework without the company having the fear of leak of information. Furthermore, it would be extremely beneficial if higher quality video conferences software would be created, as communication problems were highly mentioned when employees perform a video conference with many participants online.

5.2 Issues and Limitations

The study has its limitations, i.e. the inability to generalize findings for the whole population of companies, since it is a qualitative method with the participation of a small number of organizations. However, it can bring important contributions for the creation of new concepts in this field, which might foster and bring about different theories for future research.

Furthermore, the findings concerning political decisions arise from Brazil and Germany. Hence, the fact that such results are represented only by two countries is also considered as a limitation, as the governmental influence in telecommuting within other countries was not investigated, being then impossible to offer a comparison.

Issues concerning the industries of the companies that were interviewed should be also taken into consideration. Perhaps some results concerning technology and organizational culture might be influenced by specific characteristics from different industries (i.e. a participant highlighted that technological companies might be more adapted to the practice of telecommuting, as well as having a stronger IT department).

5.3 Further Research

First of all, as it was already mentioned within this thesis and others studies approaching the topic of telecommuting, there is an existent lack of theories in this field. There are different theories about organizational issues and technology; nonetheless, there is a latent need for theories and concepts that bring up the implications of telecommuting and online communication as a substitute for traffic within society, companies and employees.

Furthermore, the present research brought the topic of organizational culture as a big obstacle when adopting mobile work in more conservative organizations. Hence, research on the effects of organizational culture in novel forms of work and new work tools is advised, in order to comprehend the exact relationship between organizational culture and its obstacles when such advances in workplace are concerned.

Moreover, as mentioned within the limitations, the findings of this thesis cannot be applied to a whole population of organizations, as it has a small sample and as the focus here is to create concepts, which may help future researcher within the field. Therefore, it would be recommended for researchers to apply such concepts to a whole population of companies, in order to obtain expressive and quantitative results that can be generalized among employers.

Lastly, studies focusing in possible governmental actions to reduce traffic and its consequences within the work field are recommended, as incentives concerning such topic are lacking, besides the fact that there is not a variety of types of governmental stimulus when reducing mobility in work situations is concerned.

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7 Appendices

Within this chapter, the readers will have access to the interview guideline, as well as to one transcription from an interview. The rest of the documents (i.e. audio files, interviews, transcriptions and thematic analysis sheet) will be available in the CD attached to this thesis.

7.1 Interview Guideline in English

1. So, you work as a ... at the company ... Could you tell me a bit more about the company and your job there?

- Position/main tasks.
- Time on company.
- Company's main business.
- Internationalization.
- Company size/number of workers.
- Number of branches.

2. As previously mentioned, we are particularly interested in telecommuting; which means when employees work part time or full time at another place (home-based, satellite offices, neighborhood work centers or mobile), however, they are not independent workers or freelancers - they still have a link to the firm. Therefore, I would like you to talk a little bit about telecommuting on your company...

- Do the company employees telecommute?
- Which kind of telecommuting do they do (home office, telephone or skype conferences, working while travelling or at different places)?
- How often do these employees telecommute?
- How many employees practice telecommuting?
- What are the used criteria to select these employees?
- What are the aims from the company's point of view when applying telecommuting?
- Are there any specific situations/applications (type of task, position or department) that might play a role whether an employee will telecommute?

- If there are any situations where it is not worth for an employee to telecommute? If yes, what might be missing in those situations, which would allow these employees to telecommute?
- Could you name some problems or difficulties from the organization's perspective when focusing on online communication? Overall, what are the disadvantages (for the organization) of telework?
- Could you give me some examples of strategies that the company uses to deal with employees that telecommute? For example, strategies to integrate people, to promote exchange of experience, improve communication?
- Could you give any examples of achievements of your company that you consider were possible because of telecommuting? Overall, what are the advantages you see in fostering communication instead of traffic?
- One of the main points of telecommuting is the possibility of decreasing mobility, and therefore, decreasing expenses, travel stress, carbon monoxide emissions, among others. However, is there any situation where you would say that online communication or telecommuting actually fosters mobility instead of decreasing it?

2. Information technology (IT) is said to be the key to telecommuting, since it allows the work and access to the company to happen. Can you talk about the IT and the IT team in your company?

- Does the company have an IT team? How many people are on the team?
- What is the role of the IT team when an employee telecommutes?
- Does the company provide all the necessary equipment for an employee to telecommute?
- What are the tools and networks that are utilized when telecommuting?
- Is there anything missing, from the IT point of view, that an employee that telecommutes would need when teleworking?
- Is there any situation where the technology becomes an obstacle when telecommuting?
- Are there extra IT expenses that the company needs, when employees telecommute?

3. Talking about political decisions, laws and tax benefits related to telecommuting... (give a brief explanation with examples on the topic). Do you know about anything regarding this aspect that influences telecommuting on your company?

- Are there any laws (e.g. taxes) or political decisions from the government's side that stimulates telecommuting in organizations? If yes, what are they?
- Which political decisions (that have not been accomplished yet) would be helpful in order to induce organizations and businesses to apply telecommuting? Would such political decisions be a strong factor for your organization to adopt telecommuting on a larger proportion?

4. Overall, what are the reasons for your organization to apply telecommuting and focus on communication instead of traffic?

7.2 Interview

Interview with Paulinho Ramos from the company Coelho da Fonseca (real estate company)

Interviewer: Marcella Pasquarelli (MP)

Interviewee: Paulinho Ramos (PR)

#00:00:04# MP: Well, I am here to do an interview with Paulinho Ramos, he works at the company Coelho da Fonseca, which is a real estate company, right?

#00:00:14# PR: Right.

#00:00:16# MP: Ok, so let's start with the interview. First, thank you for participating and, as you know, we will talk about telecommuting and how its forms work, such as home office, Skype conferences, among others. So, you are the coordinator of digital marketing at Coelho da Fonseca, right?

#00:00:37# PR: Right. Coelho da Fonseca is a real estate company from São Paulo, it has 40 years, and there I am the coordinator of a 5 persons team, and we work with digital marketing doing all the digital actions and projects to the company.

#00:01:01# MP: Cool. And how long has it been that you work for the company?

#00:01:06# PR: It's been already two years and a half that I work at the company. I started as an analyst and today I am the coordinator.

#00:01:12# MP: Cool. And I have seen about the company having many offices in Brazil. It seems like in total there are 23 offices, is that right?

#00:01:22# PR: No, it's a little less, it's because we have some associated offices. However, we have 15 units in São Paulo, and then there are the branches in Ribeirão Preto, Salvador, Rio de Janeiro, and now in Fortaleza.

#00:01:43# MP: I understand.

#00:01:45# PR: And we also have partnerships with real estate companies, especially from the USA, Miami and New York, South America – Punta Del Este, Paris, so a bit of Europe... So we have this nice interaction with the international scenario.

#00:02:04# MP: I understand. But how do these partnerships work, is it like that you have a company in New York or is it another company that works together with you?

#00:02:17# PR: It's a bit of both, actually. It is another independent company, which we are not owners of, but they help us because they need clients to sell some products in Miami and New York especially, and we have the client that has high buying power. So today, for example, the biggest enterprise that is built in Miami, bigger than the Trump Towers from Donald Trump, is been made through Coelho da Fonseca, because is a product that aims to sell to Brazilians.

#00:02:53# MP: Very cool. So there are [branches] in the USA, and I also saw in Paris, Lisboa and Punta Del Leste, is that right?

#00:03:03# PR: Exactly.

#00:03:04# MP: Ok, so I am well informed, I think... And what is the size of the company, around how many workers there are in each branch, do you know?

#00:03:17# PR: Yes, we have... The administration people, that are post-sales department, judicial department, digital marketing, operations... we are 300 people. And the sales department, that is the brokers, sales manager, and sales directors, are 1.200 people. So we are a company, that, within the standards, is small, we have 1.500 people.

#00:03:51# MP: Cool. So now we are going to start talking about teleworking, which is basically when people don't work inside the company itself, they work at another place, could be at their house, or at another office, but the person is not a freelancer, so the person is an employee of the company. But there are other situations, such as having a Skype conference at the company, or if you use any online communication tool to do something that you could be doing face-to-face. So could you tell me a little about teleworking in your company, if you use it, which tools do you use and so on?

#00:04:40# PR: Sure. The telework on Coelho da Fonseca comes usually from the manager of the department, so there are some people that are already using this model of work and understand that this is important even for the employee, and there are some managers that still think it's important

that the employee is there every day, so it depends a lot on the department. In our case, in my specific case, I work every day in the company, but in some moments I can be absent to do teleworking. Anyway, since we are from the digital marketing department, which is a field very connected to novelty and new experiences, even in a traditional company, the real estate field is still very traditional, we use many online communication resources. We use Skype a lot, so we understand that with the suppliers, the communication there is faster, either writing or making a call, the costs are also taken into consideration, since it is a free tool, you can talk with many people at the same time, and you can be at different places at the same time. We have also started now to work with Google Hangout, which is a telework tool, but still, as it is still more common the usage of Skype between the people I work with, it is the tool that we are more used to, you can share your screen, you can show what you are seeing on your screen, being that a presentation or a video to other people, so it facilitates a lot the communication.

#00:06:40# MP: Uhum. So, how often would you say that you all telework, would you say it is every day, once a week, how often?

#00:06:52# PR: I think audio and video tools, we use at least once a week, but writing tools we use every day, there are even some companies that have these apps such as Communicator, or any other instant messenger at the company for us to communicate, so we use Skype in this sense, but audio and video tools I regard it is once a week.

#00:07:21# MP: Ok, and this question about a person practicing home office, it happens less then?

#00:07:30# PR: Yes, it happens less often and it depends on the department, one department that I can highlight that uses this a lot, is the IT department, they have a very interesting work methodology, that is performed by rotation, so some day they can stay at home, it might be on Monday because it is the beginning of the week, or Friday because they already want to stay home, so there is a rotation in the department, where at least one day of the week one person is working from home, and we don't feel that it affects the work.

#00:08:12# MP: But do you feel that this happens more because the employee asks for it, because they prefer to work one day at home, or it is something that you all think that can help the company with less expenses or anything in this direction?

#00:08:27# PR: Yeah, so if it is more from the employee's side, or the company's side... I think the request to practice home office or to telework come much more from the employee. They have this interest, it is good for him, for his health, we work in a high populated city, the traffic is very hard, the mobility is very hard, especially during the day, during the hush hour even worse, so this comes from the employee, and we have been for a long time fomenting this, and the more you talk about it, the stronger it gets, the more people understand its importance, so we are being able to reach the space to practice home office.

#00:09:20# MP: I understand. And you have said that there are some managers that appear not to like so much teleworking, they prefer to have the employees close to them and so on. Are there any criteria that you use to select the employees that can telework, or if the employee wants, he is authorized to do it?

#00:09:42# PR: Basically it goes from the manager of the department. When he decides to opt for teleworking in his team, today there are no criteria for selecting the employees, being for performance or who has the best results, so there is no such thing, it goes way more from the management to understand if teleworking will not affect the employee, the management or the company's results. So there are companies that I know outside the real estate field that use home office as an award, so if you have a good performance, you can work from home.

#00:10:35# MP: I understand. Is there any specific situation or any type of job or department that influences the choice for teleworking, for example, you spoke about the IT department, but besides that, is there any department or position that you feel that they are more likely to telework for some reason?

#00:11:05# PR: I understand. I think some jobs where the work is complex, a work with a high difficulty level that demands a higher concentration or isolation, I guess these are the more indicated to telework, initially, when the company will start with teleworking. Because you don't have distractions coming from another team members, you don't have your phone ringing to interrupt your thinking... So I will give an example: a project manager for instance, that has to implement a new project of a process on the company and needs to concentrate. So in this case, it is a good example to telework. So I see it in this way, of more complex tasks.

#00:12:16# MP: I understand, makes sense. And is there any situation where the opposite happens, where it is absolutely not good for an employee to telework?

#00:12:28# PR: I think the sales department, especially in our field, because you have to be there to attend the client. Of course, nowadays, the first channel where people look for us is the internet, before it was newspapers, and today is the internet, so the client sends an email talking about his interest, or he starts an online chat, but everything ends up on the physical contact, the present contact. It is there that you will shake your client's hands to close a deal, look eye to eye, and discuss prices... So I think this job cannot be totally transferred to telework. We have for example brokers, that work as an online team, so when you want to clarify something, they have to be there at this moment. In the moment of this first contact, we understand that it could happen when the employee teleworks, but when closing a deal, it has to be presently.

#00:13:42# MP: I understand. And can you tell me about a problem or difficulty when an employee is teleworking or any disadvantage from the organization's point of view?

#00:13:58# PR: I understand that one of the possible difficulties might be the distraction. So even though I said that during a complex job, people can focus more when teleworking, at the same time that the employee will be available to answer a call on Skype, there can be a lot of distractions, because psychologically speaking, when a person is at home, they feel that this is a moment of leisure, so it can be the TV that distracts them, the dog, or something that they have to solve internally, maybe this employee might feel that they are on a day off. This is why I think teleworking might be more suitable with more experienced professionals, with more discipline to execute their tasks. So another difficulty that we can see is controlling. I think it must be well established the work that is supposed to be done, the expectations for this work, how it is supposed to be prepared, because it will be hard to follow this closely.

#00:15:23# MP: I understand. And can you tell me if the company has any kind of strategy to deal with teleworking, for example, I don't know if there is such thing as a training, or counseling from the HR part, any strategies to integrate people, something on this direction?

#00:15:48# PR: I think, because the company that I work for, it is a starting process, we are still adapting to this culture, it is a bit hard to give employees some recommendations. I think in this first moment it is just important to establish with the employee what they have to do and what they have to deliver, nothing will substitute the physical contact. There are companies that even telework all the time, but then the managers might think "how can I realize if this employee is evolving, how

is their relationships to the people, how can I measure? Goals are easier to measure; maybe you can have a system. But doing the management of the employee's development has certain complexity. So whoever wants to start teleworking has to have very cleared which are the tasks to be executed, so there is no kind of regret of taking this decision.

#00:16:56# MP: I understand. And you spoke about the sales team that work online, answering some questions. I see this as something that the company reaches (the clients) because of online communication. But is there something that you see that the company reaches only because of teleworking or online communication?

#00:17:34# PR: There are some cases, that teleworking can help on the following sense: Coelho da Fonseca sells international properties, and it is not every client that has the possibility to go to France, the USA, to see the property that they are acquiring. And then the broker can use a tool of teleworking, so they can go to France or to USA and have a Skype conference using audio and video tools so that the client can feel that they are really seeing the property, getting to know the property. And you have many tools, like Skype, where you can share videos, you have an equipment that is called Double, which is a robot with a camera and the client can control this robot to get a feeling of being there, even though not physically. You have tools like Google Glasses, where you are seeing a person in front of you that is on the other side of another screen, so those are teleworking tools that have the power to transport people to another place, so in this situation of something international, it is super important. Some brokers use Skype, not Google Glasses, because they will start to sell them soon, but they already use Skype to do this kind of visit with clients.

#00:19:30# MP: I understand, this is very cool. So, one of the biggest advantages that people say and study about teleworking, is that the person doesn't have to rely on mobility, and this decreases expenses, stress because of the traffic jam, and there is also the point that it decreases carbon dioxide emissions and it consequently helps the environment. But is there any situation where teleworking ends up fostering mobility, in the sens of an employee teleworking or doing Skype conferences, but for some reason they are relying more on mobility and moving around with their car even more?

#00:20:42# PR: I believe so. And then we go back to the self-discipline point that I was talking about. For example, I have a colleague that teleworks from home once a week and he lives in another city, so he takes two hours to go to work plus two hours and a half to go back home, so

when he teleworks, he exercises a lot, he goes to the gym, which is something he cannot accomplish on the other days because he feels tired, so this varies from person to person to think “the time is valuable, so what will I do with this time that I am gaining?” There are some people that prefer to wake up later, and log in to the system on the time that they would be arriving at the company, because resting is also an important part for you to do good work, but I think this point of the person moving more because of teleworking is much more individual.

#00:21:56# MP: I understand. So now we are going to start the second part, which is more focused on technology. So, people say that technology is the key to telework, because technology is what makes it happens. So, can you talk a bit about the IT team in your company, how many people are in the team, if they help people who telework...

#00:22:33# PR: The IT team has around 20 people, some of these people cannot telework because they are the tech support, so they have to be physically in the company to help the employees. When there is an energy or internet problem, or a problem with any machine, but the part of the team that teleworks is very updated with such technologies, they are younger- the older people usually don't telework, maybe because they don't understand how productive it could be- but the IT team stimulates teleworking on other teams, they install programs on your notebook if you want, and they also explain how to use them, to encourage people to telework, and also relating to technology, more and more people want to work with their own computer or notebook, because they feel safer or more comfortable, so we are starting this pilot project to install these softwares and everything on the employees' computers, so they can use them at work, or telework at home, and this is another advantage that helps you to work and access everything on the time you want. Let's take the multinational example, where you need to make a conference call with two countries at the same time, so they have to find a time in common, like we are doing now, so it can be satisfactory to everybody, so I think the IT team is encouraging teleworking.

#00:24:59# MP: I understand. And is there any way for the IT team to install a connection to the network and files from an employee's house, and then the employee can have access to all the files and documents, and not having to carry a flash drive with them, is there such thing?

#00:25:23# PR: Yes, it exists. So when we talk about networks, we talk about files and folders that you could initially only access from the company. So when we talk about telework, we assume that the employee will already have a connection to internet available, the company does not offer the internet for the employee. There are ways to access the files from the company, even though a flash

drive, now I'm not talking about having the files on a flash drive, but that it contains access with login and password to the network, there is a tool that is called VPN that has login and password, and through this tool you can work and access your files as if you were in the company. So there are these tools to facilitate the work, so you can work from everywhere. For example, an employee that has to travel constantly... they have to be able to access the files, information, company's policies, so for this employee this type of technology is completely suitable.

#00:26:55# MP: Yes, actually I read a lot about VPN, which is very often used when teleworking, so yeah, I think that's it. And do you think there is anything from the IT team that might make telework harder, or anything that they could offer, but don't?

#00:27:16# PR: I think the biggest risk in teleworking is security. When you are in the company, there is some kind of monitoring on what you are doing. There are many departments in the company that work with confidential information, so there is a bit of risk to release this information. Nowadays, for example, we have an intranet that, when the employee is inside the company, they can have access to all its functionalities. When they are outside the company, the functionalities are limited, so they can access only some information that will not jeopardize the company, so I think security might be one of the only points that might keep companies from teleworking.

#00:28:21# MP: Yes. And do you know if there is any extra expense with technology to telework? Not only the IT team, because this is already an expense, but is there anything extra?

#00:28:37# PR: I don't think so. Superficially looking at this, I don't think there is any extra expense. I even think that the extra expenses will come from the employee's part, because they are using their telephone, energy, they will use more water, the internet... So these extra expenses, I think, come much more from the employee. But even then, young people seem to really like telework, because even with these expenses, they have other gains when teleworking.

#00:29:32# MP: I understand. Ok, now we are going to the third part, where we are going to talk about political decisions. I think this subject is not very developed in Brazil, nevertheless I will ask you about it. So for example, in the USA, they do the following thing: they give tax credits to companies if the company fosters teleworking, because this decreases traffic and carbon dioxide emissions and so on... Do you know if there is anything like that in Brazil, like a law or tax credits in case the company fosters teleworking?

#00:30:25# PR: First I would like to comment that I find this very interesting, it is good for all sides, it's a win-win situation. In Brazil I don't know any incentive from the government to companies to telework. Recently in Brazil, especially in São Paulo, we have a problem regarding the quantity of water in the reservoir that supplies water to companies and houses. So the government is giving a discount on the water bill if companies and people utilize less water than what they have been using during the last months. So I think it goes a lot from – I'm not a revolutionary, against the government or anything like that – but I understand that the government acts when it is also their interest. I agree with you, this is a not very explored subject in Brazil, but I think this could really work.

#00:31:47# MP: Yes, me too. And do you think if the government would promote an incentive in this direction, would that be a decision that would weight a lot when opting for telework?

#00:32:00# PR: I think this would not weight a lot, but I think it would weight a bit, it has its weight and importance. I would definitely incentive this practice, because the company would also be saving money, and now I'm seeing from the company's side, financially speaking. It is also less water that they would use, less coffee that they have to serve to employees, it goes a lot from the partners and owners of the company... I am an advertiser, and I know ad agencies that they only telework. So they have like 10 employees, and they only work from home and the company works very well, they only get together to have a meeting with a client, or something like that. So for the companies that practice this kind of work, there should be such incentive.

#00:33:07# MP: I understand. So, to end this interview, could you tell me overall, what are the reasons for a company to promote telework and apply this model of work? Overall, what are the benefits to the company?

#00:33:27# PR: I see the main benefit as the satisfaction of the employee. I think when you have satisfied and happy employees, being that financially or for some other reason, you have better results. So straight away. The first point would be the satisfaction of employees. Second, to contribute to society's welfare. We are talking a lot about traffic jam today, pollution... So it's something positive that would be brought to the local society and for the world. The third interesting point is the saving for the company, with bills and everything. So I think the three very positive and strong pillars of telework would be the satisfaction of employees, second, the contribution to society, and third, the contribution to the company.

#00:34:37# MP: I understand. Perfect! So I think that's it. Thank you very much for participating.

#00:34:46# PR: Ok, so thank you for the invitation, and if you need more information or anything else, I am available.

8 Declaration of Autonomy

I declare that I have written this Master thesis by myself and that I did not use any other sources besides the one that were here presented. All the ideas, which arise directly or indirectly from outside sources were referenced. This master thesis was not presented to any other Examination Board and it was also not made available to the public.

Ilmenau, 05.08.2014

Marcello Pasquarelli