

# The Influence of Information Technology on Telework: The Experiences of Teleworkers and Their Non-Teleworking Colleagues in a French Public Administration

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**Abstract**—The introduction of Information Technology, or IT, has brought increased possibilities to work outside of the traditional office. One of these possibilities is telework. Telework refers to work carried out away from the usual place of business, often via electronic means. Despite its predicted growth, telework has not developed in the French public sector. This study uses role set analysis to assess the experiences of teleworkers at the Conseil Général du Finistère, or CGF, a regional government in Brittany, France. Role set analysis claims that the expectations of role set holders can be evaluated. In this exploratory case study, role set holders are represented by teleworkers and their non-teleworking colleagues. Open-ended questions, in questionnaires, were used gather data. The extraction of Meaning Units, or MUs, indicated perceptions. Teleworkers experienced increased difficulties using IT at a distance. Moreover, these difficulties also affected the experiences of non-teleworking colleagues. Findings suggest that IT difficulties for teleworkers produce negative effects in the office environment. Findings also point out that telework upsets French cultural traditions which emphasise face-to-face contact.

**Index Terms**—France, information technology, telework, teleworkers.

## I. INTRODUCTION

The introduction of Information Technology, or IT, allows for increased non-face-to-face communication, such as email, and has altered the management of workers [1]. Changes in the technical aspects of workplace tools have had effects on how people work together [2]. Little is known about how these changes affect people, such as teleworkers, who have less contact in the office (and need to resolve technical difficulties at a distance). In this vein, reference [3] also suggests that knowledge transfer between teleworkers and their colleagues decreases since they have less contact in the telework context. It is utilitarian to evaluate the effects of technical issues on teleworkers and their non-teleworking colleagues in the telework environment. This study explores these effects at the Conseil Général du Finistère, or CGF, a regional government in Brittany, France.

## II. LITERATURE REVIEW

### A. Off-Site Working

Little is known about the effect of off-site technical working conditions for teleworkers [4]. It is argued, however, that reliable hardware and internet connections are key considerations for successful telework [5]. From a UK perspective, reference [6] argues that technical advances make flexible working (including telework) possible. The slow implementation of IT in France could be one barrier to telework adoption for employers [7]. This is contrasted by a study which asserts that broadband uptake is not primarily affected by governmental factors [8]. Nevertheless, there is a lack of quality IT access in continental France [7]. It is also suggested that IT is one barrier in France for telework adoption because workers are not fully functional using available tools, especially in rural areas. This also indicates that France lags behind other developed countries in terms of IT connectivity (internet/PC access and IT literacy).

### B. Telework Uptake

Studies on telework have been inconsistent and have lacked robust data. This could be due to the difficulty locating teleworkers since one inherent aspect of teleworkers is that they are often not visible. It is also unclear if the growth of telework in France has been documented with any precision. It is, however, clear that the French government has endorsed the improvement of internet access, at least at a technological level. Again, it remains unclear if governmental intervention is the primary influence for broadband uptake [8]. Within the framework of 'state modernism,' reference [9] sets objectives to improve the availability of high speed internet access for business use through fiber optic networks. This suggests that there may be structural issues associated with telework use which impede its uptake.

### C. IT Influences

Reference [10] suggests that telework is *not* due to a technological shift, but rather on occupational practice. Their study, however, does not consider non-teleworker perspectives. Conversely, reference [11] suggests that technology hinders telework growth. Though they argue that IT support is important for teleworkers and non-teleworkers, they do not consider issues outside of the Anglo-American context. Reference [12] claims that structural aspects of telework, such as IT costs, workplace furnishings and health and safety issues are often supported by teleworkers. Their

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study used multiple cases (eight) in the Estonian context. Though it cannot be claimed that their results are transferable to the French context (such as the importance of face-to-face contact in the French work culture [13]-[14], the afore-mentioned references provide insight into the importance of infrastructure and technical issues for teleworkers.

This suggests that when teleworkers do not receive adequate support from employers, teleworkers can be at a disadvantage vis-à-vis their office-based non-teleworking colleagues. Technical barriers discussed in this section reveal a lack of a remote work culture due to structural issues (e.g., internet access, IT hardware and software) in the French context. Furthermore, findings indicate that French employees lack convenient internet and IT access which also inhibit the development of telework.

### III. METHODOLOGY

A role set is composed of expectations vis-à-vis actors with whom role set holders interact in a significant way. This study focuses on the expectations of non-teleworking colleagues with teleworkers (pivotal role holders) whilst they perform their roles. It can be posited that role set holders also experience an exchange of role set responsibilities (such as extra work carried out by an office-based colleague when a teleworker is not present, as one example), and that this can create role stress.

Roles can also be described as job duties and obligations perceived by role set holders. Obligations of roles are perceived by role set holders and those with whom they interact [15]. One example is the perception of how people perceive the role of a teleworker. In the case study of the CGF, roles can be evaluated in two ways. First, the evaluation of roles bring to light what the pivotal role set holder (teleworkers in the case of the CGF) expects of other role set holders in his/her role set. Second, the evaluation of roles indicates what role set holders expect of the pivotal role set holder (again, teleworkers in the case of the CGF). The evaluation of the experiences of role set holders reveals how roles are perceived and if they are similar or different.

Role stress can emanate from the difficulty to maintain relationships [15]-[16]. In the case of teleworkers at the CGF, role stress [15] can occur when the expectations of non-teleworking colleagues vis-à-vis teleworkers are unfulfilled. Role stress can also stem from relationship difficulties with colleagues. Moreover, role stress, resulting from role accumulation, according to reference [15], is outweighed by advantages obtained by the role set holder.

Questionnaires for this study were distributed in person and via email with the option to return them electronically or by post. Moreover, the use of self-administered questionnaires, using a census approach (to target the populations of teleworkers) and a snowball approach (to target the populations of non-teleworking colleagues), allowed me to contact all participants simultaneously. The CGF telework co-ordinators, in addition to teleworkers, identified suitable non-teleworking colleagues to be asked if they would like to participate in this study. All study participants (16 teleworkers and 11 non-teleworkers) were

guaranteed anonymity.

Meaning Units [17], or MUs, represent groups of text, not necessarily full sentences or paragraphs, which can render meaning. Meaning is derived from text since they reflect 'lived experiences' from participants. This method maintains that the interpretation of lived experiences can be retrieved through the collection of qualitative data. This is anchored in the tradition developed by reference [17] in phenomenological psychology. This was a useful method to extrapolate qualitative data to explore study participants' perceptions. These data were used in the form of quotes in study findings.

### IV. FINDINGS

My findings reveal the importance of reliable internet and phone connections for teleworkers, which is congruent with reference [5]. Nevertheless, in France in 2007, 45% of all internet subscribers did not have access to lines capable of receiving internet and telephone simultaneously [18]. Teleworkers and their non-teleworking colleagues in the CGF study were asked what technical issues affected telework.

*Without a reliable internet connection, telework is impossible. Need to be able to be assisted at home by an IT hotline (teleworker 15).*

Other teleworkers claimed that hardware issues were an impediment to complete tasks.

*A slight lack of IT knowledge can lead to a great loss of time (teleworker 4).*

*When printers, scanners are unavailable or when one has to travel to another location urgently, or react to an urgent letter, I am slowed down by telework (teleworker 12).*

Teleworkers appeared to be disadvantaged in terms of remaining up-to-date with computer systems. Participants' comments underscored that an unreliable internet connection can hinder completing tasks at a distance. This is congruent with reference [12], which claims that telework is dependent on technology.

*Slow network connection, my personal internet connection is used for telework, no IT technician from the CGF has come to my home to check my IT installation (teleworker 12).*

Non-teleworkers claimed that IT connections and internet access are important for teleworkers.

*Slow IT connections (non-teleworking colleague 6).*

*Internet connection problems (non-teleworking colleague 9).*

Non-teleworking colleagues revealed factors linked to

difficulties experienced by teleworkers. My findings show that non-teleworkers receive adequate internet support on-site through the IT department of the CGF. Teleworkers, by contrast, had to resolve internet and IT network connection problems with their respective service providers directly (when working on systems that were not provided by the CGF). Teleworkers and non-teleworking colleagues, with few exceptions, felt that teleworkers depend on reliable internet connections.

My findings from teleworkers indicate that they experience technical difficulties, such as a lack of access to systems available in the office, including laser printers and certain software programmes.

*Weaker internet connection away from the office. Difficult to load certain documents and connect to the network (teleworker 3).*

This is also revealed in the study by reference [12] on teleworkers' technical expectations. Moreover, since all teleworkers had IT installations before the study, many IT-related issues had most likely been resolved. Teleworkers claimed that there were difficulties to perform IT repairs at a distance.

*Defective IT connections – not being able to be resolved by the IT assistance from my employer (teleworker 14).*

*Since I do not have IT access as an 'administrator,' I have to contact the IT hotline for all technical questions (teleworker 16).*

As another example, the CGF did not provide printers for staff on the telework programme. In this vein, one non-teleworking colleague claimed that teleworkers have less effective office tools.

*Teleworkers at home have less office space and need to have reliable IT tools (non-teleworking colleague 3).*

Non-teleworkers claimed that technical difficulties arose when teleworkers have to solve problems without support from the organisation (at a distance).

*Difficult to reach the teleworker when IT systems are down (non-teleworking colleague 4).*

*IT maintenance, plan to have extra material if there is a breakdown, to save time, they may not have all tools such as a fax (non-teleworking colleague 7).*

My findings advance that the CGF, despite the implementation of the telework pilot programme, has not developed adequate IT support to facilitate remote working. This also indicates that despite the existence of the telework programme, the CGF has not developed a remote working culture.

## V. CONCLUSION

Despite the initiative to implement telework at the organisation, IT systems at the CGF have not been adequately adapted. My findings reveal that IT support for teleworkers is carried out on a case-by-case basis. I also feel that my role as an 'outsider' inhibited me from understanding the deeper perceptions of IT support for employees at the CGF.

Since I did not have contact with teleworkers to discuss their IT-related difficulties in greater detail (such as through the use of probing questions during interviews), I had to work within the constraints of questionnaires. One example was limited contact if a respondent had questions (respondents could nevertheless contact me by email, for example).

Moreover, and from a cultural perspective, it may not have been 'appropriate' for teleworkers to complain about IT systems in place, since the employees in charge of IT systems at the CGF are their hierarchical superiors. In the French context, this suggests that subordinates may hesitate to voice difficulties to line managers, even anonymously, due to perceived hierarchical distance.

My qualitative findings from teleworkers reveal a lack of technical support. This suggests that telework is one driver that can help develop a remote working culture at the CGF. This culture could be constituted by the implementation of IT support for teleworkers equivalent to non-teleworkers. By contrast, my findings reveal that a key shortcoming for teleworkers stems from the lack of IT updates and access to IT administrators.

Individuals questioned in this study experienced IT-related difficulties and found alternative solutions when no IT support from the CGF was available (such as printing at the office when no off-site printer was available). This reveals that the CGF programme remains in its infancy from a technological perspective. My findings reveal a need for internet and IT-related support to provide tools for teleworkers equivalent to those used by office-based staff (such as software and hardware).

In terms of technical aspects of telework, my findings reveal that teleworkers' experiences are unsatisfactory. This is congruent with a study from reference [12] which argues that telework negatively alters IT conditions for teleworkers. Furthermore, my findings suggest role stress for teleworkers because they are required to carry an additional role of IT support provider, often without technical expertise. This situation can also magnify role stress, since teleworkers have the additional burden of organising their work according to location (e.g., using certain IT programmes and printers at the office versus at other locations), as illustrated in replies.

In my research, role stress is also experienced by non-teleworkers when they cannot reach teleworkers (when teleworkers are located away from the office). Moreover, the expectations of non-teleworkers can remain unsatisfied when teleworkers cannot provide assistance due to technical problems. Furthermore, role stress for non-teleworkers is generated when they are confronted with additional tasks, because of the absence of teleworkers. Though my findings are exploratory, they can nevertheless provide deeper insight into the effects of IT on teleworkers and their office-based colleagues in the French work environment.

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