










Remote Working: A Way to Foster Greater Inclusion and Accessibility?

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Abstract. The COVID-19 pandemic has brought several changes in everyday life, one of them being the application of Remote Working (RW). RW is the new way of working, thanks to this new modality all workers, with certain work requirements, were able to carry out their work from home without having to go to the office. Given the strict rules relating to lockdown, if this method had not been applied many people would not have been able to work and today many companies would probably be closed. But which advantages and disadvantages can RW have compared to classical work? Can it bring more inclusiveness and accessibility for every one or only for workers with specific requirements (for example, for workers that need to take care of family members with disabilities)? This paper attempts to answer these questions. The University of Perugia in collaboration with the Ministry of Economic Development has created the “Job-satisfying” project. In this project 24 participants were divided into two groups (home-space group and office-space group) and each of these had to complete some tasks and complete questionnaires. Generally, no significant difference emerged but some interesting results were encountered: those who took the experimentation from home, that have children, obtained higher scores relating to the sense of working autonomy, support from superiors and satisfaction of relationships at work. This data seems to argue that working from home can improve inclusiveness.

Keywords: Remote working · Smart working · Working from home · Inclusiveness · Accessibility

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1 Introduction

Remote working (RW) has emerged as a solution to the limitations imposed by the COVID-19 outbreak. Recent estimates for the USA show that remote workers have quadrupled to 50% of the US workforce [1, 2]. Before the pandemic, Italy was the European country with the lowest share of teleworkers, with only 1% of remote workers [1]. During the March/June 2020 lockdown (Phase 1), the Minister of Public Administration in Italy declared that 90% of public sector employees were engaged in RW. The present study reports a survey on the work quality of employees at the Italian Public Administration (PA) by comparing a group of them working in traditional office-space (control group) with another group working in home-space (i.e., RW). The DGTCISI-ISCTI (Ministry of Economic Development, Directorate General for Communications Technology and Information Security – Higher Institute of Communications and Information Technologies), as part of the introduction of new RW methods in the PA, in collaboration with the University of Perugia and the Presidency of the Council of Ministers, initiated a research project called “Job-satisfying”. The aim of the project was to investigate, through a remote usability test, the impact of “smart working” (or “lavoro agile”, a term used in Italian law to refer to working from home or RW [3]) on the quality of work and satisfaction of the PA employees involved in the study.

Our drive for this survey emerged from wondering if RW, beyond just being a solution to the pandemic, could offer a beneficial solution (well-being) for workers with physical disabilities (e.g., walking disability) or working far away from home. Can RW present as an inclusive opportunity (inclusion) for those who have to manage the dual role of parent and worker or for those with non-binary gender identity and expression who experience barriers to sharing common workspaces (e.g., use of bathrooms). In other words, could RW give greater accessibility and inclusiveness to work?

Preliminary to this study, a literature review was conducted to identify which dimensions of work experience are able to mostly represent quality, efficiency and satisfaction in workplaces [4]. According to this systematic review, 10 dimensions emerged as the most relevant to measuring the experience of inclusiveness and accessibility in the RW condition: engagement with work (ENG), flexibility (FLEX), health and well-being (HEAL), layout and technology (LAY), organizational and job-related aspects (ORG), performance (PERF), personal needs and style (PERS), satisfaction (SAT), subjective gain (SUBJ) and work–life balance (WLB).

The purpose of the present study was to evaluate the work inclusiveness and accessibility of the Italian PA in the RW condition through the 10 dimensions mentioned above.

2 Method

The study is exploratory research involving voluntary PA employees, divided into two groups, who were assigned a work task to be carried out in work from home (home-space group) or from their own office (office-space group). In particular, the participants were asked to create a simple usability test of the website of the Ministry of Economic Development (<https://www.mise.gov.it/>). To carry out the task, the “eGLU-box PA 1.0”

platform was used, a tool recently made available to all web editors of the PA for evaluating the usability of online services [5].

The proposed experimental design is correlational and semi-interventional, taking into consideration the working conditions (2x) of home-space versus office-space as independent variables (manipulated) and user experience (1x) in working technologies as the dependent variable (observed/experimental).

2.1 Participants

A total of 24 PA workers (12 males, 12 females) with an average age of 52 years (min. = 25; max. = 66; SD = 8.85; SE = 1.89) participated in the study. Out of 24 participants, 66% successfully completed the usability test ($n = 16$) but the remaining 33% did not complete the survey ($n = 8$). Among the participants who completed the usability test, nine (56.3%) belonged to the office-space group and seven (43.7%) to the home-space group.

2.2 Questionnaire and Measurements

A sociodemographic questionnaire gathered information about the participant's workplace (home-space/office-space), part-time/full-time job, travel time to the workplace and transportation to reach the workplace. In addition, personal details were asked: age, gender (as assigned at birth), gender identity, number of family members with and without disability, number and age of children, children in didactic learning and self-perception of housing quality (on a seven-point Likert-type scale, with a higher score meaning greater housing quality).

Four standardized scales were also used to assess different dimensions associated with the worker's experience with the job conditions (home-space and office-space), as follows:

1. *Advantages and Disadvantages Scale* (ADV [6]). This is a 29-item self-report questionnaire to investigate WLB as the main dimension and ORG, LAY, HEAL, SUBJ and PERS as secondary dimensions. Answers are provided on a five-point Likert-type scale where 1 = "strongly disagree" and 5 = "strongly agree"; a higher score means greater advantages/disadvantages.
2. *Management Standards Indicator Tool* (MSIT [7]). This is a 38-item self-report questionnaire to assess FLEX as the main dimension and ORG and HEAL as secondary dimensions. Eight subscales can be obtained from this questionnaire: demands, control, peer support, managerial support, relationships, role clarity, support of change and work environment. The answers are provided on a five-point Likert-type scale where 1 = "never" and 5 = "always"; higher total scores mean greater management of and sociality at work.
3. *Individual Work Performance Survey* (IWPS [8]). This is a 27-item self-report questionnaire to assess PERF as the main dimension and ENG and HEAL as secondary dimensions. Three subscales can be obtained from this questionnaire: (i) task performance scale; (ii) contextual performance scale; and (iii) counterproductive work behavior scale. The answers are provided on a five-point Likert-type scale where

1 = “never” and 5 = “always”; a higher score means better work performance for scales (i) and (ii) but worse performance for the scale (iii).

4. *Work Related Basic Needs Satisfaction* (WRBNS [9]). This is an 18-item self-report questionnaire to assess the SAT dimension in three subscales: autonomy, competence and relatedness. The answers are provided on a five-point Likert-type scale where 1 = “strongly disagree” and 5 = “strongly agree”; a higher score means greater satisfaction of social and individual needs at work.

2.3 Procedure

An invitation was sent by the Department of Public Service to the management of the various Italian PAs to identify employees who were interested in voluntary participation in the research. Employees who replied to the invitation received an email explaining the survey procedure and a link to access an Internet platform where informed consent, a privacy statement, a sociodemographic questionnaire and measurements were administered. The time spent on the survey platform was recorded for each participant. After completing the questionnaire and measurements, the participants were briefed about the tasks to be carried out in the eGLU-box PA and the link to access it. The time spent on the eGLU-box PA platform to create a usability study was also recorded.

Participants logged into the eGLU-box PA platform with the credentials they were given by us. Their first task was to create a usability test related to the site of the Ministry of Economic Development (MISE). The participants then had to create tasks to be carried out on the MISE website. In Fig. 1 you can see the first task that all the participants had to create. Participants had to create a total of 4 tasks. After adding all the tasks, the participants validated the test, made it accessible, and invited a “test user”.

The screenshot shows a form titled "Task 1" with the following fields and content:

- Title ***: Start-up innovative
- Estimated duration (in minutes)**: 5 minutes
- Initial URL ***: <http://www.sviluppoeconomico.gov.it/>
- URL to reach to complete the task correctly ***: <https://www.gazzettaufficiale.it/eli/id/2019/07/05/19A04418/sg>
- Instructions ***: Sei il co-fondatore di una società che ha sviluppato un'app di annunci di lavoro. Hai letto su Internet che le imprese ad alto valore tecnologico potrebbero rientrare nella categoria delle "startup innovative", le quali godono di specifiche agevolazioni. Vuoi saperne di più e, dunque, partendo dalla homepage, cerchi di:
 1. Individuare l'area relativa agli incentivi per le start-up e PMI innovative;

Fig. 1. Section to create tasks in eGLU-box PA.

3 Results

The average time taken to complete the survey was 12.64 h (SD = 42.01; SE = 10.51). More specifically, the office-space group took an average of 3.11 h (SD = 7.71; SE = 2.57) and the home-space group took an average of 24.90 h (SD = 63.45; SE = 23.98), showing a significant difference ($t[14] = -1.03$; $p = .03$); there was also a significant difference ($t[11] = -3.07$; $p = .02$) with regard to the time taken to complete the tasks in eGLU-box (26.00 min; SD = 15.09; SE = 4.18). However, there were no significant differences between the groups with regard to responses to the questionnaires or to the perception of housing quality (M = 5.94; SD = 1.65; SE = .41). The usability test conducted in eGLU-box PA was successfully completed by 85.7% of the home-space group and by 44.4% of the office-space group. In Table 1 it is possible to view the average scores of the participants regarding the WRBNS questionnaire. In Table 2 it is possible to view the average scores of the participants regarding the ADV questionnaire. In Table 3 it is possible to view the average scores of the participants regarding the MSIT questionnaire. In Table 4 it is possible to view the average scores of the participants regarding the IWPS questionnaire.

Table 1. Average score of the subscales of the WRBNS questionnaire, obtained from the answers given by the participants to the specific items. The scores were divided into the following categories: all participants, office-space group and home-space group.

WRBNS subscale	Average score of all participants	Average score of office group participants	Average score of home group participants
Autonomy	13.13 (SD = 3.845; SE = 0.961)	12.78 (SD = 3.1144; SE = 1.038)	13.57 (SD = 4,860; SE = 1.837)
Competence	19.50 (SD = 3,425; SE = 0.856)	19.68 (SD = 2.958; SE = 0.986)	19.29 (SD = 4.192; SE = 1.584)
Relatedness	15.81 (SD = 3.270; SE = 0.818)	14.89 (SD = 3.516; SE = 1.172)	17.00 (SD = 2.708; SE = 1.024)

Table 2. Average score of the subscales of the ADV questionnaire, obtained from the answers given by the participants to the specific items. The scores were divided into the following categories: all participants, office-space group and home-space group.

ADV subscale	Average score of all participants	Average score of office group participants	Average score of home group participants
Advantages	48.56 (SD = 8.989; SE = 2.247)	49.33 (SD = 7,697; SE = 2,566)	47.57 (SD = 10,998; SE = 4,157)
Disadvantages	32.69 (SD = 10.562; SE = 2.641)	33.44 (SD = 11.260; SE = 3.753)	31.71 (SD = 10.388; SE = 3.926)

Table 3. Average score of the subscales of the MSIT questionnaire, obtained from the answers given by the participants to the specific items. The scores were divided into the following categories: all participants, office-space group and home-space group.

MSIT subscale	Average score of all participants	Average score of office group participants	Average score of home group participants
Demands	29.63 (SD = 5.691; SE = 1.423)	30.22 (SD = 7.345; SE = 2.448)	28.86 (SD = 2.795; SE = 1.056)
Control	20.81 (SD = 4.215; SE = 1,054)	22.78 (SD = 4.116; SE = 1.372)	18.29 (SD = 2.928; SE = 1.107)
Peer support	15.31 (SD = 3.554; SE = 0.888)	14.89 (SD = 3.855; SE = 1.285)	15.86 (SD = 3.338; SE = 1.262)
Managerial support	13.00 (SD = 4.546; SE = 1.137)	13.11 (SD = 4.595; SE = 1.532)	12.86 (SD = 4.845; SE = 1.831)
Relationships	16.19 (SD = 3.710; SE = 0.927)	15.67 (SD = 3.941; SE = 1.280)	16.86 (SD = 3.716; SE = 1.405)
Role clarity	22.13 (SD = 2.217; SE = 0.554)	21.56 (SD = 2.455; SE = 0.818)	22.86 (SD = 1.773; SE = 0.670)
Support of change	10.06 (SD = 1.982; SE = 0.496)	10.44 (SD = 2.068; SE = 0.689)	9.57 (SD = 1.902; SE = 0.719)
Work environment	10.94 (SD = 2.816; SE = 0.704)	11.33 (SD = 2.739; SE = 0.913)	10.43 (SD = 3.047; SE = 1.152)

Table 4. Average score of the subscales of the IWPS questionnaire, obtained from the answers given by the participants to the specific items. The scores were divided into the following categories: all participants, office-space group and home-space group.

IWPS subscale	Average score of all participants	Average score of office group participants	Average score of home group participants
Task performance scale	28.63 (SD = 3.948; SE = 0.987)	28.00 (SD = 4.062; SE = 1.354)	29.43 (SD = 3.952; SE = 1.494)
Contextual performance Scale	46.38 (SD = 8.421; SE = 2.105)	46.78 (SD = 8.258; SE = 2.753)	45.86 (SD = 9.263; SE = 3.501)
Counterproductive work behavior scale	17.00 (SD = 3.266; SE = 0.816)	16.67 (SD = 3.640; SE = 1.213)	17.43 (SD = 2.936; SE = 1.110)

4 Discussion

The results show no differences between the home-space and office-space groups in terms of questionnaire responses or usability test completion times. The results of the questionnaires showed that the workers were, on average, satisfied with their work experience and no significant differences were found between the two groups.

The only exception in performance between the two groups is the time elapsed from the moment the participants opened the instructions of the experimental tasks to the moment they decided to start the usability test (i.e., creating a usability study with the eGLU-box PA platform). However, the much higher times for starting the usability test in the home-space group did not affect the total time spent on completing the test in eGLU-box PA. In other words, the greater autonomy shown by the home-space group in the decision to start the task does not seem to affect its completion times (efficiency). Furthermore, a greater number in the home-space group (85.7%) correctly completed the usability test (effectiveness) compared to the office-space group (44.4%). Both the efficiency and effectiveness results show that the participants who took the usability test at home managed to better organize their time, with better results, than those who took the test from their office.

5 Conclusion

This paper is part of a project called “Job-satisfying” carried out by the Italian PA during 2021. The study is a preliminary feasibility study into the effects of working from home on Italian PA employees’ well-being. The experiment consisted of four questionnaires to evaluate the most relevant dimensions of inclusiveness and accessibility in the RW condition [4]. The questionnaires were administered to two groups of participants conducting the usability test in two conditions, namely, home-space and office-space. All the participants performed the experimental tasks through a usability assessment web-based platform called eGLU-box PA, a tool developed by the PA to evaluate the usability of its digital platforms and services [10]. The results showed no differences in the overall experience between the two experimental conditions. However, differences in usability test completion rates were identified: more participants from the home-space group were able to complete the usability test (85.7%) in the eGLU-box PA compared to participants in the office-space group (44.4%). This result may indicate that working from home allows workers to achieve better performance results. Furthermore, the results showed that those in the RW condition were able to manage their time better than those who performed the experiment from the office, probably because of a higher level of autonomy in deciding when to start the usability test. We can say that RW or “smart working” allows for better accessibility, as the participants of this group have been able to manage their time better with very positive results, from their device in an easy way, all while staying at home.

In general, no significant differences were found between the two groups, but by analyzing the answers to the demographic questionnaire some interesting points emerged: those who have children and took the usability test at home obtained higher scores relating to the sense of working autonomy, support from superiors and satisfaction of relationships at work. This seems to argue that working from home can improve inclusiveness.

In future works, it is intended to extend the project to a larger number of PAs and investigate in greater depth the roles of the personal data variables of children and cohabitants in the family unit, the sharing of living and working spaces, the means of transport and the times used to go to work on the job performance and satisfaction of

needs as perceived by the worker. Furthermore, it would be interesting to conduct a survey in which the worker performs his “everyday work”.

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