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Abstract. Digitalization of work takes the giant leap forward and that our society has entered the digital era. Smart working became the norm adopted by all institutions. With the spreading of covid-19 pandemic, all organizations yielded to novel ways of working. The effect will be permanent, and digitalization of work takes the giant leap forward. Organizations need to support and develop competencies for smart working for the twenty-first century, and yet this is an area largely overlooked in the literature. The general objective of this article is to analyze how to effectively support smart workers build digital resilience using a competency-based approach. The development of a digital resilience framework outlines the core competencies for smart working. The model is based on a qualitative analysis of people's perceptions related to smart working and digital resilience at both individual and institutional level. We conducted a qualitative and exploratory re- search using semi-structured interviews. The results constitute a first step to how organizations can apply this digital resilience framework to support smart working.

Keywords: Digital Resilience – Smart Working – Individual – Organizational Resilience – Resilience framework

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1 Introduction

During the last decade, the expansion and adoption of new digital tools and digitally mediated communications has changed the way in which people work, access, consume and communicate information, having a leap impact on the development of agile working.

This trend has been accentuated with the Covid-19 pandemic context. Global information systems especially mass-media, social media and similar sources effectively delivered people the news on the spot, taking into consideration the way to minimize social contacts in real life. There are several examples on how societies kept on going based on sociotechnical environments. The digital communication and sociotechnical

work environments started to have effect of the pandemic, and at this stage, it appears obvious that digital technologies are embedded in our daily life.

These advancements have provided significant benefits to employers and employees. However, studies show that when workers forego the emotional, mental and physical restorative effects of 'switching off', they are likely to experience a deterioration of work-life balance, wellbeing, job effectiveness and performance [1].

As employers have the legal duty of care to protect worker health and safety, the question facing employers and employees is how to embrace the benefits that new technologies bring to agile working, while mitigating their negative effects. Recent studies have explored the competencies needed to counteract the negative effects of digital-stressors at work [2-4], in order to incorporate technology into everyday life in a sustainable and healthy way [2-4].

We position our research on how to support smart workers as they negotiate, adapt and manage the stressors that arise from the incorporation of Information and Communication Technologies (ICT) into everyday life. Many organizations started experimenting smart working for the first time during the COVID-19 pandemic. This paper aims to explore the combination of the concepts of the Smart Working and Digital Resilience, which would give us some insights to answer the research following question: what is the perception of these two (embedded) concepts in this Digital era? The objective is to propose a framework which is expected to incorporate ICT and Digital Technologies in everyday life in a sustainable way. This helps the practitioner and the academic world in improving the understanding of these concepts and of their implications.

For this purpose, a qualitative study, carried out among employees in the field of Smart Working. The results will be analyzed in order to identify the main elements that point out from the combination of Smart Working and Digital Resilience.

The paper is structured as follows. We summarize the theoretical background in Section 2. In Section 3, we explain our methodology and introduce the context and the sampling for the study. After exposing the perception of Smart Working and Digital Resilience in Italy, we present and discuss our findings in Section 5 with the analysis aimed at finding a sustainable framework for Smart Working based on Digital Resilience. Finally, in the conclusion, we expose the practical and theoretical implication of our results before presenting our guidelines for future research.

2 Literature review

2.1 Smart working

Today, most digital businesses fit one or both of these points; they focus on creating value at new frontiers for their core business, or they use digital technology to drive growth, revenue and performance in ways that were impossible with traditional models.

The implementation and management of digital services can necessitate organizational restructuring, especially as new roles are created, and information systems are given greater input into strategic decisions [5].

The concept of Smart Working (SW) finds its origin in the literature stream studying the application of non-traditional and flexible work practices [6,7] that offers higher levels of flexibility and autonomy in the choice of working spaces, time and tools. The development and adoption of SW involves that modern companies strive to provide flexible work arrangements and creative office environments in order to as- sure more employee productivity without decreasing job satisfaction while assuring organization competitiveness and maintaining well-being balance between professional and personal life of their employees [8]. According to this approach, Smart Working provides all employees of an organization with the best working conditions to accomplish their tasks, attain objectives and achieve results while respecting their own life rhythm [9].

In line with this, an increasing number of organizations are rethinking their business models in the light of smart working. More and more companies [10] start refer- ring to SW as a set of organizational interventions aiming to fully release the innovation potential of their employees, providing them with higher levels of autonomy in the choice of their working spaces, time and tools, and asking in return a strong commit- ment in achieving corporate goals [11].

According to Mann [12], the practitioners are focusing their attention on three es- sential complementary elements that have a direct impact on the implementation of smart working:

- the use of ICT,
- the innovations in human resources management practices in organizational mod- els,
- the reconfiguration of the workplace layout.

The ICT refers to the development and diffusion of digital technologies, especially those supporting communication, collaboration and social network creation [13].

The role and impact of ICT becomes preponderant with the increasingly pervasive dissemination of powerful and easy-to-use mobile devices [14], and strengthens work- ing groups in easily sharing files, information and ideas [15].

The second element (HR element) refers to the HR practices made available to em- ployees in order to exercise their flexibility [16, 17] through training programs and new communication plans. HR practices emphasize strategy projects of cultural change that tend to affect the behaviors of the employees and their attitude toward risk taking, adaptability and innovation [18].

The third element that have an impact on SW implementation refers to the changes accomplished in the physical workplace (workplace layout). Recent works emphasize the importance of strategies related to spatial reconfiguration of the office layout [19, 20] in order to increase employees' productivity and better manage their work-life bal- ance [14].

From another point of view, many researches point out that working from distance makes not only communication, but also management more complex [21, 22]. Due to distance and lack of direct interactivity, the role of managers will increasingly be based on trust and monitoring of performance linked to objectives and projects [23]. Thus, managers 'competences and skills are based on setting objectives, enforcing deadlines, and mastering communication to attain company results while allowing their teams to balance the time dedicated to private and professional life [23]. These authors [23] show

that remote workers tend to develop a very personal mode of organizing work and communicating, which may create problems in terms of data security but also work-life balance. Achieving work-life balance while doing smart working requires also skills that may not have been necessary to perform the same tasks in the office.

Many studies confirm that one of the risks of smart working is related to work-life balance, and more specifically to the isolation that remote workers may encounter due to the lack or decrease of interaction and communication [22, 24]. In order to minimize this risk and allow employees to flourish also while smart working, organizations can for instance construct a feeling of proximity by balancing virtual and face-to-face exchanges [23].

However, most of contributions tend to focus only on one element per time, narrowing down the focus in order to have manageable empirical settings. Very few contributions consider two elements simultaneously.

Following the authors [25], while, to our best knowledge, no contribution investigated the SW phenomenon in a comprehensive fashion while considering all the three elements over which practitioners are focusing their attention. Based on these considerations, our paper constitutes an original and enriching approach by analyzing the perception of smart workers regarding the benefits and barriers of smart working at both individual and institutional level and taking into consideration the three SW complementary elements together, ICT, HR and workplace layout, that have a direct impact on SW implementation.

In addition to the above, another interesting model is the Socio-technical Systems (STS) which came out in the 1950s to overcome the dehumanization of work, especially in the psychology area. The basic concept behind was to increase productivity by improving the human work experience. According to this approach, the way in which people organize the work and the technological systems are mutually influenced.

2.2   Resilience by digital

In general, resilience denotes the capacity for continuous reconstruction as a process to negotiate, adapt and manage stresses enabling individuals to "bounce back" in the face of adversity [26].

Our focus is on how to support smart workers as they negotiate, adapt and manage the stressors that arise from the incorporation of ICT into everyday life. The Conservation of Resources (COR) theory provides a useful framework to explore this.

The concept of organizational Resilience. Resilience is understood as the capacity of individuals and organizations to bounce back or bounce forward from external shocks and to proactively adapt to constant change through pathways to build capacity and develop resources within and beyond the organization [27, 28]. Resilience is applied broadly as a framework to understand how individuals and organizations respond and adapt to environmental and societal changes [29]. For the purpose of our study, we will define the concepts of individual resilience and organizational resilience, in order to better understand and outline the notion of digital resilience.

Individual resilience has been predominantly studied within psychology and healthcare settings [30]. It refers to the capacity for maintaining or regaining psychological wellbeing in the face of challenge [31]. Individual resilience depends on various personal factors including the circumstances of a person's life-course, their inter- action in formal and informal networks, education, socio-demographic status and employment opportunities, and the availability of resources. As all these personal factors influence an individual's capacity to adapt [32], they have an impact on digital resilience.

At the organizational level, resilience has been used to describe the inherent characteristics of those organizations that are able to respond quicker, recover faster, or develop more unusual ways of doing business under duress than others [33, 34]. Regarding employees, the term has been used to refer to the ability of organizational members to bounce back, and even succeed, in the face of problems and adversity [35, 36].

The organizational resilience is the capability of organizations to react, adapt and act according to internal or external signals or pressure [37]. It is how organizations structure their activities in order to anticipate and circumvent threats and opportunities to their continued existence. The development of resilient organizations involves the re-organization and restructuration of work practices and mostly relies on capacity of adaptation of people within the organization.

At the organizational level, a resilient organization is one that not merely survives over the long term, but also flourishes, passing the test of time [38]. Organizational resilience is a strategic imperative for an organization to prosper in today's dynamic and interconnected world characterized by volatility and uncertainty. Managing the organizational resilience requires the adoption of best practices by building competence and capability at both individual and organizational levels to deliver business improvement across all aspects of the organization.

In line with this approach of organizational resilience, resilience is pinned to sociotechnical environments; it is facilitated and enhanced by digital. Resilience is based on human attributes (individual resilience), yet it is materialized in novel ways of utilizing sociotechnical environments as well as human ability to adapt to new situations (social attributes) and creatively use the ICT infrastructure and tools available within the organization (organizational resilience). In this paper, resilience by digital is approached as an individual and organizational and social attribute.

Digital resilience is the ability to manage technology so that work and health outcomes are managed equally, effectively and sustainably [39]. It means that we can continue working in a flexible manner but at the same time be aware when it is time to switch off and focus on other important aspects of lives, such as well-being and relationship. Employers need to find ways to integrate technology into the employee experience so that smart working benefits are realized, and digital stressors are mitigated [2]. The term "digital-stressors" refers to any negative effects that technology may have on the user [40]. There is no common definition of digital stress, which is broadly defined as technostress, i.e., stress caused by technology [41]. For these authors [3], digital resilience refers to the specific knowledge, skills, attitudes and behaviors (personal resources or competencies) that need to be acquired, built and protected to counteract the negative effects of digital stressors. Through building digital resilience, smart workers learn how to negotiate, adapt and manage the negative psychological effects of

digital-stressors, in order to improve wellbeing and workplace outcomes. This research [2] shows that building digital resilience is a two-way process occurring at both individual and organizational level. Individuals are responsible for utilizing resources that are available to them to optimize their well-being [2].

The relevancy of our study is based on a building digital resilience framework that could allow smart workers, through their individual and contextual resources, to manage digital stressors.

Digital resilience is s pinned to sociotechnical environments, i.e. how resilience is facilitated and enhanced by platforms, tools, media, social media, digital convention, and digital practices. As proposed above the resilience is not caused by sociotechnical, yet it is significantly boosted by it. Resilience is human attribute, yet it is materialized in novel ways of utilizing sociotechnical environments as well as human ability to adapt to new situations and creatively use the infrastructure and tools available. Put into action the resilience by sociotechnical is operational resilience as human ability to adapt quickly to new outlining requirements, and organizational resilience as organizational capability to use resources and adapt and even excel in unexpected change.

Digital resilience. Theory of Conservation of Resources COR. We position our research by addressing resilience by sociotechnical as operational resilience, i.e. ability to adapt quickly to new outlining requirements, and organizational resilience, i.e. organizational capability to use resources, adapt, and even excel in unexpected change. In this perspective, the Conservation of Resources (COR) theory [42] provides a useful framework to explore it. COR theory is underpinned by a belief that individuals are motivated to acquire, build and protect resources in order to achieve their goals.

COR theory states that stress is neither first nor foremost a product of individuals' appraisal of events, but that it has central environmental, social, and cultural bases in terms of the demands on people to acquire and protect the circumstances that ensure their well-being and distance themselves from threats to well-being [43]. Hence, these authors [43] identified two distinct types of resources: contextual and persona. Contextual resources are located outside the individual and set in the environment. These resources include social support, autonomy and opportunities for development and feedback, whereas personal resources are inherent to the individual and include physical, psychological, affective, intellectual and capital resources [43].

Knowledge, skills, attitudes and behaviors (i.e. competencies) are considered to be personal resources that can be developed over time. The more resources an individual has, the more effective they are at responding to situations. Some researchers [42] argue that resources do not exist individually, but travel in packs (resources caravan). For instance, job autonomy (contextual resource) is likely to increase when e-workers work remotely. In turn this may lead to a reduced commute, with time saved (personal resource) enabling more time to be spent with the family (contextual resource). In this instance, the acquisition of contextual and personal resources creates a buffer against digital-stressors (i.e. longer working hours, social isolation).

Thus, building resources is, therefore, a way to build resilience, enabling individuals to negotiate, adapt to and manage stressors. Emerging studies confirm the importance of knowledge building (personal resource) and the value of social networks, social support and relationships (contextual resources) [44, 45].

Studies in this area are limited, with research typically centered on children, students and high-risk groups, and most of the resilience literature is prescriptive and normative [46, 47]. Our study aims to fill this gap in the literature by exploring, analyzing and understanding of digital resilience through a dynamic approach at both individual and contextual/institutional level in the context of smart working.

We'll position our research on the Digital Resilience Competency Framework Study. This framework identified five overachieving themes [2] that could be used to build a digital resilience framework for smart workers. The themes clustered are:

- Social and relational competencies
- Trust
- Knowledge
- Personal efficiency
- Self-care.
- Social and Relational Competencies

We'll define these five themes for the need of our study, then further refining the framework.

A research [2] revealed a positive relationship between low social and relational competencies and high technostress. This confirms the importance that social competencies (social resources and family cohesion) have on mitigating stressors and supports the competencies. The challenge is to manage social relationships through technology, networking, communication skills and social support in order to support resource building to satisfy relatedness needs.

- Trust

Effective Smart working is based on trusting team members to deliver work and avoiding micro-management. Trust is multi-directional and needs to be developed over time to support mutual respect [2]. The complexity of smart working may re- quire the trust-related competencies to evolve to reflect a new employment context where employees can work anywhere and anytime [2]. These findings are supportive of the competencies: developing trust, organizational skills, autonomy, prioritization skills, and integrity and appear to support resource building to satisfy autonomy re- quired in smart working.

- Knowledge of Tools and Technology to Support Smart Working

In Clarke's research [2], participants recognized that technology and its effective use was key to enabling successful smart working. Lack of understanding on what and how tools should be used could led to participant frustration, with missed communications. Increasing literacy on digital tools combined with broadening understanding on how and when to use tools would aid user effectiveness, decrease stress and emphasize social competencies of smart working caused by lack of clarity and missed knowledge. These findings are supportive of the competencies of I.T. knowledge, adaptability and self-confidence.

- Personal Efficiency

Some studies reveal a positive relationship between low personal efficiency and high technostress [2]. Self-motivation, time management skills, self-awareness, communications skills and cognitive flexibility are valuable competencies likely to support the building of resources for digital resilience.

- Self-Care

A research [2] asserts that 20% of survey participants indicated that they did not know when they needed to switch off from technology and more than 15% of participants did not know what action to take when being constantly connected. This suggests that more than 35% of smart workers may be experiencing the negative effects of constant connectivity without fully understanding the impact it may be having on their well-being. This reconfirms the importance of self-care and self-awareness of health and well-being in a context of smart working.

3 Research Methodology

Smart working results a crucial topic especially during the Covid-19 pandemic revolutionizing the labor force management. It is important to highlight that not all types of jobs can be done remotely. Thus, the present study specifically refers to smart working only with reference to those categories of jobs that can be set remotely not requiring the physical presence.

Moreover, to explore and investigate a complex issue such as smart working, this paper follows a qualitative and exploratory research approach, which is define by the potential for revealing complexity by its richness and holism [48]. Based on the relevant literature, the use of qualitative research methods is adequate to analyses "a con- temporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" [49]. Therefore, this article used an exploratory qualitative approach following a content analysis [48].

3.1 The context

On January 30, 2020, the World Health Organization (WHO) defined the outbreak of Covid-19 [50]. This pandemic is one of the most unprecedented crises of the 21st century. It originated in the city of Wuhan, in China, in December 2019 and it easily spread worldwide, having Italy as one of the most affected country.

The Covid-19 forces several countries and economies to adapt and consider lockdown. The intensity and the temporal element of the needed restrictions impacted in a significant manner many organizations and employees in several industries [51].

This require a better understanding of this in the organizational environment and from an individual side.

3.2 The data collection

The data collection was structured through a series of semi-structured interviews with expert conducted, due to the pandemic restrictions, either by phone or email between February 2021 and May 2021. The duration of the interviews was between 45 minutes and one hour.

Our sample is composed by twelve individuals having responsibilities in the working setting organization and management. According to numerous academics, there is no optimal sample size; however, a number between six and twelve informants [53, 54] is recommended. In addition, the size of the sample is defined considering the theoretical saturation principle [55].

The experts interviewed were either managers or senior executives. The interview guide includes 9 questions focusing on two main themes: smart working and smart resilience. (Fig 1) shows the interview guide used.

Interview Guide

With the spreading of Covid-19 pandemic, we enter the digitalization era, and smart working was imposed to all institutions in order to survive

1. What are the competencies required for smart working? At an individual level
2. What are the benefits or smart working? At an individual level
3. What are the barriers of smart working? At an individual level
4. How would you qualify digital resilience?
5. How are you striving to preserve and acquire resources in order to achieve your goals?
6. What are the contextual resources you rely on during this situation?
7. What are the individual resources you want to protect? What are the one you want to build?
8. In your opinion, what are the individual characteristics that may favor digital resilience?
9. What are the contextual resources that might influence a Digital resilience strategy?

The research methodology is the result of a long-term, in-depth qualitative process including both theoretical research and empirical analysis [56]. The analysis considered both at the theoretical and empirical sides of the smart working phenomenon [57].

In line with the most significant scientific contributions and with the purpose of this article, we adopt a descriptive approach to analyze the phenomenon in a narrative form [58]. The latter provide us the possibility to examine the data within the context under investigation [49].

4 Results and Discussion

In an era characterized by several digital trends and settings, it results fundamental that the society, both in terms of single individuals as well as of organizations, is going to

respond to a change and to adapt promptly to it. The Covid-19 pandemic and its uniqueness show the importance of being able to adapt to better survive in a Darwinian prospective. On one side, we could observe those economic actors that, having already adopted smart working beforehand, demonstrated to be culturally and techno- logically ready to switch to a remote mode of work at the point of the emergency.

In such a particular context, individuals and organizations should capture the new challenges and opportunities. Thus, the Covid-19 acts as an accelerator of the digital transformation and of the development of a smarter approach in the working model. At the same time, the Covid-19 highlights the role of digital resilience.

The present investigation suggests that both smart working and digital resilience require individual and organizational competences such as personal soft skills, time management, learning capacity, flexibility, proactiveness. These findings suggested that the Covid-19 reopens a discussion toward a new working environment which requires a digital knowledge base both for the employees as well from the managerial/organizational side. Therefore, it emerged that important resources should be de- voted to better answer to this digital trend which is useful to improve the smart working setting in the actual pandemic as well as in the future.

In other words, from an organizational point of view, several resources appear to be crucial as: tools in digital technologies, investments in software, investments in all technological tools to work from home, courses, trainings. For instance, training should be used to better explain to employees, at different levels, the new technological scenario as well as all the processes and steps required to improve their knowledge of an online organizational setting.

Thus, the Covid-19 outbreak has not implied layoffs yet, but rather a change in the hiring specifications which now include skills and capabilities focused on the technology are fundamental for the smart working, it represents a good opportunity to test the functioning and suitability of smart working.

In other terms, we can consider the present emergency crisis as both an opportunity and a challenge to test the digital maturity of many sectors/industries/organizations and, consequently, an important experiment that may lead to reconceive the business models of many public and private players.

In addition, the advantages and disadvantages are also provided both at the individual and organizational level. On the individual side, we found that smart working allows more flexibility, autonomy and reach a better work-life balance. However, people missed the human face-to-face contact that increases isolation. On the organization side, several costs such as office renting can be avoided. However, the most relevant drawbacks are the perception of less control of the employees works as well as less visibility with clients.

In conclusion, from our analysis, smart working and digital resilience have embedded each other to face the required current transformation. Our findings reveal that in the today's scenario, our society as a whole is going forward different businesses approaches which require a rethinking about the working and the digital setting. This is an ongoing process which is gaining a growing acceptance and efficiency.

5   Conclusion - theoretical and practical implications

In this study, we aim to examine, through the Theory of Conservation of Re- sources, what are the personal and the contextual resources that can foster Digital Resilience in order to propose a framework for a sustainable smart working. The findings provide some insights regarding the developmental stages of an original and previously un-published competency framework for managing digital resilience.

This framework is linked to two theoretical models: Conservation of Resources Theory, which highlights the need to build resources to offset digital-stressors, and the three essential complementary elements that have a direct impact on the implementation of smart working: ICT, innovations in human resources management practices and the workplace layout [12].

Our findings point out over-arching themes that can be used as categories to organize the personal competencies and the contextual resources that would better support and develop e-worker digital resilience. This framework can now be utilized by e- workers, managers and organizations to support smart working, with a focus on improving well-being. This not only benefits e-workers in terms of building digital resilience but also has the potential to improve work-based outcomes and help organizations to meet their legal obligations and protect against potential human, financial and psychological damages.

The results of our study provide some interesting insights related to theoretical contribution on both concepts of Smart working and digital resilience through the complementary framework of Smart Working: the adoption of ICT, the HR practices innovation, and the workplace layout. Specifically, this study allows highlighting the elements characterizing Smart Working models and the contingent conditions that foster their implementation in a sustainable way. SW organizations tend combining resources rationalization with employee creativity. Digital SW organization focus on establishing collaboration and a sense of community among their employees. Complete smart working organizations tend focusing on work-life balance and see the innovativeness of its assets as a by-product of a satisfied employee, who has to be retained as a key resource.

The exploratory findings allow us to provide practical guidance to organizations, managers and e-workers on the competencies that need to be developed to support digital resilience. Assessments could take place prior to employees starting a period of smart working, enabling appropriate interventions to be put in place from the outset. Within the digital resilience framework, organizations can support the development of e-worker knowledge and personal efficiency competencies. For instance, building knowledge on specific I.T. products and tools could increase user understanding, acceptance and efficacy.

Our results show that firms should focus their attention and their investments on all the three elements that characterize a SW setting in a comprehensive and holistic fashion. In this way we found empirical support to the importance of complementarities between the three elements by supporting the discussion of Milgrom et al. (1991). In order to concretize the SW potential, companies should invest on the development of a mobile workplace allowing employees to work also outside the firm facilities, and firms to progressively develop flexible models of ICT governance. In fact, this study provides

an important approach to how we conceptualize and operationalize SW concept, and to how complementarities between the three elements characterizing a SW practice matter.

This study has some limitations that should be mentioned. Firstly, our results could be expanded to a larger sample in order to build and elaborate on our findings. Secondly, the results are mainly based on the points of view of people during Covid-19 context. In future research, semi-structured interviews can be carried out with the responsible in order to ask them about their personal experience with smart working and its impact on Digital resilience.

We also suggest that future research should explore how managers should devote more effort in thinking about restructuring their old work practices in order to implement new forms of work characterized by higher levels of flexibility, which can bring higher returns for the company.

Managers should think about implementing SW practices, not only for achieving better returns at company level, but also because SW can bring benefits at individual level. Therefore, policymakers should think about several questions that concern the characteristics that firms should have for succeeding in a SW environment; the requirements for educational and training for firms and individuals, and how they need to be delivered and accessed; what the role of managers in ensuring that a dispersed team able to respect its tasks; and what the right technologies for providing the support and the connection to make effective a SW implementation.

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