

Do Organizations need a Head of Remote Work?

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Abstract. Following the Covid-19 pandemic emergency, the percentage of remote workers has increased exponentially with more than 82% of the workforce operating from home in April 2020. After the first lockdown period, the percentage of remote workers decreased radically, and in 2021 has been estimated around 35-40%. However, doubts and criticisms have arisen about whether organizations are carrying out remote working practices effectively. Adopting the socio-technical system (STS) perspective, this paper aims to investigate the specific characteristics of remote working to identify the major factors encouraging agile working, rather than just remote working, in organizations. A causal-effect path will be depicted to explain the evolution of remote working adoption in organizations, and the need of tasks and job redesign, business processes reengineering, innovative eHRM policies, cultural changes, and new organizational roles. The paper describes the new organizational roles, tasks and competences aimed at enabling an effective adoption of agile working in organization.

Keywords: Remote Working, Agile Working, Socio-Technical System Analysis, New Organizational Roles, Pandemic Covid-19.

1 Introduction

This paper focuses on the combined effects of two main phenomena that have been impacted by the innovations of digital technologies starting from the 90s:

- Flexible and remote work: many organizations introduced flexibility in managing the time and geographical location of the work, defining and introducing organizational practices referred to as teleworking (Niles, 1998). Over the past two decades, remote working, conceived as working elsewhere than at the office (Krishnakumar & Choudhury, 2014), has been representing a widespread practice. Recently agile working (flexibility about where, when, and how practitioners do their work) is increasingly common across all production fields (Jeyasingham, 2020; Schmidtner, et. al., 2021).

- Knowledge management and the role of knowledge worker: knowledge, in its different forms, has been increasingly recognized as a crucial asset in modern organizations and knowledge management refers to the process of creating, codifying, and disseminating knowledge within organizations through the deployment of corporate-wide Intranets to ensure physical accessibility to information, the design of contribution processes which enable employees and knowledge workers to codify their knowledge in the corporate language, the development of enterprise knowledge portals, which provide a simple interface through which people can provide, share, and retrieve information and knowledge.

Before the SARS-COV-2 (commonly called Covid-19) pandemic emergency, the average adoption of work-from-home practices, under the names of remote, agile, or smart working in Europe was: 20.2% in UK, 16.6% in France, 8.6% in Germany, and only 2% in Italy, with 570,000 employees in total (Arregui Pabollet et al., 2019; Milasi et al., 2020; Eurofound, 2020). Various decrees issued by the Italian Government (Decreto del Presidente del Consiglio dei Ministri – D.P.C.M.) during the ongoing COVID-19 pandemic emergency have facilitated this new organization of work. In this period, remote and smart working has been indicated as a preferred, in some cases compulsory, method of carrying out work as a remote service.

Because of the situation generated by the spread of Covid-19 and the enforcement of public health measures to contain the virus, many companies shut down operations forcing the adoption of remote working (Bongaerts et al., 2021; Rapaccini et al., 2020). In March, April, and May 2020, 65.9% of Italian companies shut down and half of the remaining active companies (17.1%) decided to adopt smart working with the involvement of 2,205,000 employees (ISTAT, 2020; OECD, 2020a, 2020b). In Italy, the diffusion of smart working increased from 3.9% (1,124,754 employees, 13th March 2020) to 7.6% (2,179,000 employees, 25th March), up to 28% (8,000,000 employees, 20th May 2020). The Italian National Institute of Statistics (ISTAT) estimated that in June 2020: 90% of large enterprises (over 250 employees), 73% of medium-sized enterprises (between 50 and 249 employees), 37.2% of small business (10-49 employees), and 18.3% of micro-enterprises (2-9 employees), introduced or extended the possibility for their employees to engage in smart working during the emergency period.

One year after the first pandemic wave, 40% of workforce is willing to continue to work remotely in 2021. However, numerous doubts and criticisms exist about whether organizations are carrying out remote working practices effectively and in a profitable manner. According to various nation-wide surveys¹ and many other recent studies underlied the fact that a lack of strategy, policies, practices, and incentives badly affected the remote work (Schmidtner et. al., 2021; Mancl & Fraser, 2020). In particular the following issues can be raised:

- Spaces: only one third of workers has a dedicated space and around 20% of workers practiced home nomadism moving from one room to another;

¹ <https://www.assolombarda.it/centro-studi/smart-working-2021>; last retrieved 30/08/2021
<https://intranet.unige.it/survey-sul-lavoro-agile-epoca-pandemia/> last retrieved 30/08/2021

- Work wellbeing: little or no attention is paid to the right to disconnect and big stress is caused by remote monitoring (which is considered a form of control);
- Organisation of work: only half of the workers have changed part of their job, mainly in the relationship with direct superior/manager;
- Technologies: no proper tools and platforms/software for remote work were available of a third of the workers.

Huge discussions arise among big players on how to deal with remote and agile working, since most of the workforce get used to work from home or abroad. Google recently backtracked from its plan to make all employees return to the office and allowed many to work remotely. Apple's plan to force its staff back to the office has caused many to leave the company and led to substantial internal opposition². Jack Dorsey, CEO of Twitter, had stated, already few weeks after the outbreak of the pandemic, that company's staff can work from home forever, if they wish to do so. On the opposite, Reed Hastings, CEO and founder of Netflix stated that home-working is "a pure negative". On February, David Solomon, CEO of Goldman Sachs, called work from home "an aberration"; on June, Morgan Stanley's CEO stated "we want you in that office"³.

This disagreement reflects the current uncertainty about the impacts of the pandemic on the future of the workplace.

Adopting the socio-technical system (STS) perspective, this paper aims to investigate the implementation of remote working in organizations to identify the major factors influencing a successful adoption of agile working. Each factor will be clarified in the nature and aims. According to the STS approach which follows a cross-disciplinary perspective, because of strong link between work systems and people who interact with each other and/or with machines, a human-centered design perspective is required for making any changes within organizations (Bednar & Welch, 2019).

In the following sections we will provide some data about the state of the art of smart working, and how it has been changed in the last years, and we will sketch out the research question. Then we describe the framework of analysis, taking into consideration the most common variables of STS framework of analysis. These variables will be used to study the process of digital transformation and how remote working adoption is evolving due to the exogenous tension caused by Covid-19 pandemic. From a research point of view the paper demonstrates that STS framework can be used to unveil a list of critical aspects and interdependences between social and technical aspects that enrich the model and improve innovation and change management in a more evolutionary perspective. From a more practical point of view the paper underlies the needs of a new set of organizational roles.

² <https://fortune.com/2021/06/08/return-remote-work-hybrid-model-surveys-covid/> last retrieved 1/06/2021.

³ <https://forbes.it/2021/06/18/se-potete-andare-al-ristorante-potete-venire-in-ufficio-il-richiamo-alle-armi-del-ceo-di-morgan-stanley/> last retrieved June 2021

2 Theoretical framework

Over the last decades, the prefix “smart” has been gradually recognized as a term to qualify the innovative use of digital technologies in many business areas, even remote working. Several studies propose conceptual frameworks that highlight the semantic differences between the term teleworking, flexible working, smart working, and agile working. The analysis of trends on flexible working has been conducted Yu et al., (2019) and by Sullivan (2003). Grant (2020) introduced the basic notions, the concepts, and the measurement of Agile working, and finally Torre & Sarti (2019) analyzed the trends in smart working in Academy. All these studies shed some lights on cases, practices, policies but few on the regulatory framework as in the case of Rymkevich (2018). Finally, a socio-technical theoretical approach has been proposed to effectively analyze the phenomenon (Bednar & Welch, 2019). As described in Cuel, Ravarini & Varriale (2020):

- Teleworking or remote working refers to the ability to work in a place other than the company office, such as another office, coworking areas, home, park or any other place that has internet connections and online platforms (e.g. Skype, Hangout, Slack, Hibox, Asana) which ensure communication and coordination;
- Flexible working refers to flexibility in locations, hours, and/or contracts. It may include teleworking, compressed weeks, part-time, project work or other contractual agreements;
- Agile working refers to several practices that allow organizations to optimize work by emphasizing proactivity, agility in managing activities and coordinating with others;
- Smart working refers to a new approach for designing work addressed to the efficiency and effectiveness of activities through the combination of flexibility, autonomy, agile collaboration and coordination, optimization of work tools. Bednar & Welch (2019) found out that with smart working, organizations and workers are invited to substantially rethink their relationships, by creating new jobs, acquiring new and more innovative skills (multitasking, virtual team work, etc.), choosing more independently spaces, hours and work tools, acquiring greater responsibility for results.

Unfortunately, the above-mentioned terms are widely used as synonyms in the managerial lexicon and in organizational practices, due to the lack of widespread and shared best practices.

This paper wants to shed some lights on the real implementation of remote, flexible, agile, and smart working, identifying the critical variables for the management of organizational change.

The evolution of remote work practices, described in the previous sections, provides an exemplar use case (and probably the most representative during the coronavirus pandemic) of organizational change driven by technology. Indeed, the literature on this topic is very broad and still rests on mature basis of studies carried out far before the advent of the internet. Recently, Pasmore and colleagues (2019) effectively reviewed the progress of the research in this field, concluding that, in the current times of social

and technical disruption (possibly made even harsher by the pandemic), the principles of STS represent a compass to interpret the transformation of organizations. Similar considerations arise adopting the lens of the fourth industrial revolution (Margherita & Braccini, 2020): the changes synthesized in the concept of Industry 4.0 find an appropriate representation “considering the socio-technical systems impact on people, infrastructure, technology, processes, culture and goals” (Sony & Naik, 2020: p. 1). Otherwise, already in 1993, Purser and Pasmore (1993) showed the applicability of STS to non-routine knowledge work. Leveraging on this and other foundational research, Bednar and Welch (2019) proposed to extend the result of the research using STS for Industry 4.0 to knowledge-intensive activities, and more specifically to smart working.

With smart working, the worker is seen as a provider, located in non-predefined places, of a service, delivered at times that change over time, and operates in a continuously evolving relationship with the organization. Coherently with this definition, smart working is claimed to be based on three fundamental pillars (Raguseo, Gastaldi & Neirotti, 2016):

- the social dimension, regarding the human resource management practices and the behaviors of workers within organizations;
- the technological dimension, referring to digital technologies that enable employees to work remotely and, finally,
- the physical dimension, related to the layout and ergonomics of the environment where the work takes place.

Therefore, the conceptual framework of STS represents an excellent basis for interpreting smart working as decomposable along both technical and social dimensions, strictly interdependent and complementary to each other. Complementary refers mainly to communication processes, workflow management, co-creation of knowledge and competence, balance between private and working life, leadership oriented towards work flexibility and knowledge sharing, autonomy, proactivity, and workers empowerment (Dossena & Mochi, 2020).

The STS approach is based on the assumption that change requires a human-centered design perspective, since work systems see the participation of one or more people who interact with each other and/or with machines (Bednar & Welch, 2019). This approach, following a cross-disciplinary perspective, suggests combining in a single representation the variables that are typically the subject of distinct disciplines (Mohr & van Amelsvoort, 2016). Figure 1 shows the typical representation of a STS and templates (Bostrom & Heinen, 1977; Cherns, 1976; Cooper & Forest, 1971; Sutcliffe, 2000; Yurtseven & Buchanan, 2013):

- a technical subsystem, including organizational variables interacting in business processes (subdivided into activities and tasks) converting inputs to outputs; and technological variables, i.e., technologies, means and tools recognized as the main engine for implementing processes;
- a social subsystem, that includes human variables, relating to the characteristics of the people who operate in the organizational system (qualification, attitudes, motivation, personality); and social variables, i.e., the set of interpersonal relationships

that people create within the organizational system and formalize through the organizational structure.

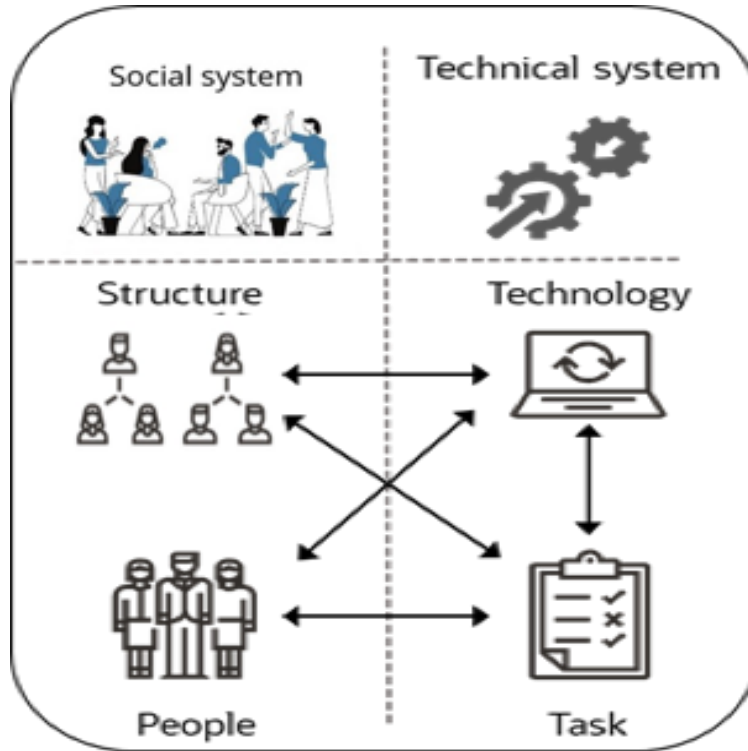


Figure 1. Socio-Technical Systems [Source: Adapted by Cuel et al., 2020]

3 Main and expected findings

By observing the evolution of smart working through the lens of the STS framework, the four components described above can be recognized and in the following sub-sections we analyze and discuss each of them.

Smart working requires a radical change, which should push institutions to move from a logic of fulfilment towards a logic of service. In this perspective, the objective of smart working is to enable workers balancing work and private life, encouraging productivity through more efficient processes, also reducing the time associated with commuting. To protect workers, the weakest category, an agreement between the employee and the employer is required regarding:

- the alternation of work outside the company boundaries and in presence;
- the direct interaction with superiors and the socialization with colleagues at certain times of the day;

- the compliance with the maximum limit of daily working hours;
- the right to disconnect from work electronic devices;
- the control and evaluation of the workers aimed at measuring their results.

Therefore, to adopt remote, flexible, agile, and smart working, organizations should ideally, on one hand study and approve an implementing regulation involving the HR division. On the other hand, they should train employees executive and other employees across different office locations with IT, administration, and technical professionals.

On the contrary, during the pandemic emergency all these activities were skipped and replaced by the mere recommendation to employees to stay home and work using digital devices already available to them (both company or personal devices)(Eurofound, 2020; Chebly, Schiano, & Mehra, 2020; Phillips, 2020).

3.1 Technical system

From the point of view of the structure of IT systems supporting smart working, a key issue is to ensure workers an easy access to the systems. This can be achieved with technological solutions such as the integration of platforms and the improvement of the user experience of software applications, especially workplace collaboration and video-conferencing applications, or with organizational solutions, such as the provision of help desk services (Davis, 1993).

At the individual level, the choice of the technological equipment should first of all take into account - as regards the applications - the different familiarity with digital technologies and the different technical skills in the use of software. Therefore, a one-size-fit-all model could prove highly inadequate (Hitchcock, Laycock & Sundorph, 2017). With regards to the hardware infrastructure, during the pandemic, organizations were concerned with providing employees with a personal computer, a mouse and a keyboard.

The core issue during the pandemic was to provide tools, IT services and instruments to allow employees to work from home or elsewhere. No recommendation was provided – at the beginning – on HR training with executives about communication, behaviors, task performances and measurements, and so forth. Nor training to monitor and empower agile work. Much attention has been paid instead to the strengthening of security by improving Virtual Private Network (VPN) connections, and purchasing new IT devices and cloud services.

In previous studies, we saw that in the organizations where smart working was already discussed, developed, or introduced, the pandemic emergency has accelerated the processes of internal socialization. In all these cases the emergency facilitated the formalization of agreements between organizations and workers, without officially negotiating with the workers trade unions. Paradoxically, the lack of rules facilitated and streamlined the implementation process of remote and smart working, enabling people to take care of working dynamics and the institutions to deal with their own self-regulations. From an operational point of view, one of the enabling factors was that the remote, agile and smart working activity was addressed at individual level.

The adoption of smart working is associated with (Bednar & Welch, 2019; Sarti & Torre, 2017):

- the recognition of greater control of workers over their activities;
- the reduction of phenomena of alienation and routine at work;
- the creation of a more articulated and creative professional network;
- job enrichment and greater involvement in work activities (empowerment).

All these actions have been introduced after few months from the massive introduction of the remote work, during what we could identify as the “second phase” of the emergency. The work didn’t change radically, but a series of factors – such as the pressure on workers’ performances, the need of remote control, the issue of well being in a stressful situation, (the so called zoom fatigue), the need of an adequate space at home to work - started to rise the debate about the implications of remote working and about which specific solution would be ideal in each organization . Only after a while, smart working has been considered as a new model of work organization based on trust, goal-oriented approach, restoring flexibility to people, higher autonomy and empowerment of the employees. On the managerial side, the greater virtualization and delocalization of work require innovative leadership models based on an agile and mindfulness approach and aimed at coordinating remote workers and virtual teams.

3.2 Social system

In the second half of the 2020 year, during what we could identify as the third phase of the pandemic emergency, it was quite clear that remote work implies drawbacks and risks, such as a higher gap between employees with or without digital skills, a lack in organizational trust and organizational culture, the isolation of workers, digital overload

Radical changes are also required in the organization of the work and in the articulation of the roles. Remote worker personal and working lives have often overlapped, digital tools have become, for some, the only point of contact with the outside world. Employees were catapulted into a new way of working without getting the time to provide them with adequate training. Furthermore, the replacement of physical interaction with digital interaction, combined with a culture of constant connection, is compounding digital overload which was already identified as one of the defining problem of today’s workplace (Rosen & Samuel, 2015). Also, following the strong push to digitalization driven by the pandemic, researchers and executives have been questioning on how business processes should be redesigned to make remote work effective and more sustainable in the long term. Some issues to consider are (Schenk & Dolata, 2020; Amirul & Mail, 2020):

- to redesign the set of tasks of a process and their allocation across involved individuals;
- to take into account the constraints on interpersonal communication arising from the physical distance between individuals, the allocation of tasks, the increase in autonomy in the management of activities, the temporal distribution of the tasks of each

individual to ensure a proper work-life balance, the management of diversity and disabilities;

- to favor the management of work spaces at home;
- to reduce the shortage of digital skills for managing increasingly complex technological tools;
- to manage communication and the sense of belonging of workers.

Companies should develop abilities in the design, planning and control of objectives (Mergel, Ganapati & Whitford, 2020; Marović & Bulatović, 2020). Moreover HR managers have to manage relationships between employees, unions, managers, team leaders, and doing it remotely certainly requires innovative skills and tools.

In a massive virtualization and relocation of work, employees need to learn how to define and plan tasks and activities, scheduling them, optimize time and process management, and cope with information overload associated with the sheer quantity and high rate of information received in “push” mode from multiple sources such as workplace collaboration applications, corporate messaging tools, video-conferencing systems, work and personal devices.

They also need proper skills to master new digital collaboration tools, to run digital meetings and provide management feedback as required.

Moreover, managers should be trained to the new roles, to work by objectives, strengthening the employees skills for effective virtual interaction with colleagues, and a more effective communication.

4 Discussion: the need of a Head of Remote Work?

The classic distinction between technical and social components of the STS refers to a static representation of an organization. However, in this paper, the STS model is used as a compass to describe the dynamics of organizations adopting remote working. As mentioned in the previous paragraphs, it is possible to analyze the experiences of remote working adoption from a time span perspective. It is therefore possible to recognize four phases along which technical and organizational components play different roles. First, a pre-emergency and experimentation phase where both technical and social aspects are taken into consideration. Then an emergency phase, with the massive introduction of new tools and methods - the technological aspects where more relevant than the social ones –. Finally the post-emergency phase, that is a phase of consolidation in which human and organizational aspects become more and more relevant. In each phase, some common elements emerge.

1. Pre-emergency/experimentation phase: generally the process of innovation is slow since it takes into consideration both the organizational and technical issues. In this phase, a lot of discussions usually emerges since many workers prefer to maintain the status-quo. Innovators need to negotiate with unions that are aimed at protecting the workers' benefits and rights. The experimentation usually involves a very limited number of individuals, under a voluntary willingness to innovate and to test the new solution. Changes are incremental and often refer to a small and non-significant part

of the whole organization such as few individuals, few changes in the tasks, and so on. Technology is an enabling factor, but the effects of its introduction are controlled and delimited;

2. Emergency/massive introduction of new tools and methods: Innovation is mainly driven by the technological variable. The social and individual variables formally and substantially take a back seat, and task changes are limited only where there is a need for new services to citizens/users. The attempt is to replicate the previously and well established behaviours in the new technological settings. Some tensions may occur, due to the fact that the new settings have generated a strong change in the work-life balance and in all workers' habits. The more autonomous and empowered workers crafted their job, adopted some tools to measure and assess the activities, changed the nature of job, but the majority kept carrying out the well-established behaviours;
3. Post emergency/consolidation phase: The technological variables are consolidated but a stronger need of social aspects arise. The development process can take two directions: to keep the changes and improve the social side, go back to the previous pre-emergency state recalling pre-emergency behaviours, attitudes, incentives, tasks, processes, and so forth. The choice of institutionalizing change and improving the organization seems the most challenging ones, since all the workers, at all levels, need to learn new form of work organization.

In the third phase the need for a new role emerged: the head of remote work. In medium-large US companies, a new role hit the market: the Head of Remote Work⁴. The numerous examples already available provide an interesting variety of job titles, and C-level position, such as: Director of Remote work, Head of dynamic work, Head of remote, Director of remote work, and so forth. According to a study by T3 Advisors⁵ 12% of companies in the US tech sector created a managerial role with organizational ownership for remote working, while in 39% of the analyzed cases the role was created within the Human Resources function.

Despite there is no standard definition of these roles yet, some common features can be defined. As the job title would suggest, it may feel safe in assuming that this role oversees the remote share of a workforce. However, the role is quite more complex than that. Head of remote work need, in fact, to showcase good communication skills, must be able to channel complex decisions to a broad audience, to act on a constant stream of feedback, to demonstrate a great attitude for innovation, problem-solving, and self-starting. The hardest and most technical competencies seem to be project and program management, business processes and design principles, user experience design tools and methodologies, ability to understand how people operate when working remotely, knowledge of organizational development and organisation design principles. Head of remote work should also be experienced with management level roles, in functions such as Business Operations, People Operations or Human Resources, with business process redesign, change management, and communication, and with planning, design and delivery of digital internal communication events.

⁴ “The three new executive roles that define 2020”, The Economist, December 8th, 2020

⁵ <https://www.t3advisors.com/> retrieved June 1st, 2020

Analyzing online job postings for this role, we have identified the following filled or to-be-filled positions:

- Director of Remote Work (shared with Head of remote learning) by Facebook
- VP of Real Estate & Workplace and Remote Experience by Twitter
- Head of Remote (shared with Work HR specialist) by Quora
- Head of Dynamic Work by Okta
- Head of Remote by Hopin, GitLab, AngelList, Prezi, Oyster
- Remote Hub Site Lead by Stripe
- Director of Remote Work by Gong
- Head of Virtual First (shared with VP of Design) by Dropbox
- Senior Director Colaboration & Productivity by VMWare
- Head of Distributed Work by CloudFlare
- Remote Communications Manager by Zapier
- Manager of Remote-First by Vistaprint/Cimpress
- Director of Remote Workforce Solutions by Cleveland Clinic
- SVP & Director of Remote Work by Avalon Consulting Group
- Director of Remote Operations by Strata Solar
- Remote Operations Manager by iTech Media

As a matter of example, the responsibilities required are the following ones:

- Lead a team of “cross-functional” leaders across the company to help make the transition to remote work (Head of Remote Work @Facebook)
- Work with company leaders on strategy, structure, and process around the hiring and management of remote teams (Head of Remote Work @Gitlab)
- Audit and pressure test all existing workflows, policies, and cultural underpinnings to ensure that they are adapted for remote-first (Gitlab Remote Playbook)
- Collaborate with all functions of the business to support clients and partners seeking guidance on mastering remote workflows (Head of Remote Work @GitLab)
- Collaborate with the HR Department to improve on-boarding and manager training to operate with remote-first workflows (Head of Remote Work @Gitlab)
- Champion a company-wide all-remote culture and initiatives through content creation, interviews, webinars, case studies, podcasts, and partnerships with external organizations (e.g. universities; industry board; etc.) (Head of Remote Work @Gitlab)

5 Conclusions

The presence of a strong external contingency factor, such as the Covid-19 pandemic emergency, forced all the organizations to massively adopt technological tools and implement new forms of remote, flexible, agile, and smart working practices. As often happens, a crisis situation becomes a trigger of radical innovation. After the imposition of working remotely during the lockdowns, companies realized the need to introduce flexible, agile and smart working practices. In this paper, this evolution is described using the STS approach as a reference conceptual framework. As a last current phase

in such evolution, organizations are now aware of the need to acquire and develop new competences, procedures, and new roles. This more recent needs are described in the last section. More research efforts are required to investigate if and how the different approaches showed so far by the most advanced organization will converge into new templates or organizational models. Otherwise, our study is able to provide some interesting insights from the practice viewpoint. Indeed, it is clear the strong need for the organizations to invest much more and pay attention to: on one side, the new and digital competences and skills required for developing and introducing these innovative forms of remote, flexible, agile, and smart working practices; on the other side, the new and different needs of the workforce in terms of sources of work-related stress or tools required for their ordinary job. Effective training and learning programs are required, as well as focused interventions to improve leadership skills for top and middle managers and the overall governance of the organizations, and also adequate corporate welfare policies (work-life balance, support for disability relatives, fast wifi connection, etc.) and practices to mitigate the risks of digital overload.

References

- Amirul, S., & Mail, R. (2020). Strategic Flexible Working Arrangement: The Realignment between Human Resource and Management Accounting. *Humanities & Social Sciences Reviews*, 8(4), 1252-1265.
- Arregui Pabollet, E., Bacigalupo, M., Biagi, F., Cabrera Giraldez, M., Caena, F., Castaño Muñoz, J., Centeno Mediavilla, I., Edwards, J., Fernandez Macias, E., Gomez Gutierrez, E., Gomez Herrera, M., Inamorato Dos Santos, A., Kamylyis, P., Klenert, D., Lopez Cobo, M., Marschinski, R., Pesole, A., Punie, Y., Tolan, S., Torrejon Perez, S., Urzi Brancati, M. and Vuorikari, R., (2019). The changing nature of work and skills in the digital age, Gonzalez Vazquez, I., Milasi, S., Carretero Gomez, S., Napierala, J., Robledo Bottcher, N., Jonkers, K. and Goenaga Beldarrain, X. editor(s), EUR 29823 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-09207-0, doi:10.2760/373892, JRC117505.
- Bednar, P. M., & Welch, C. (2019). Socio-technical perspectives on smart working: Creating meaningful and sustainable systems. *Information Systems Frontiers*, 1-18.
- Bongaerts, D., Mazzola, F., & Wagner, W. (2021). Closed for business: The mortality impact of business closures during the Covid-19 pandemic. *PLoS one*, 16(5), e0251373.
- Bostrom, R. P., & Heinen, J. S. (1977). MIS problems and failures: A socio-technical perspective. *MIS Quarterly*, 1(3), 17-32.
- Chebly, J., Schiano, A., & Mehra, D. (2020). The Value of Work: Rethinking Labor Productivity in Times of COVID-19 and Automation. *American Journal of Economics and Sociology*, 79(4), 1345-1365.
- Cherns, A., (1976). The principles of sociotechnical design. *Human Relations*, 29(8), 783-792.

- Cooper, R., & Foster, M. (1971). Sociotechnical systems. *American Psychologist*, 26(5), 467.
- Cuel, R., Ravarini, A., & Varriale, L. (2020). *Technology in Organisation: Digital Transformation and People*. Italia: Maggioli. - ISBN: 9788891646088.
- Davis F.D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38(3), 475-487.
- Dossena, C., & Mochi, F. (2020). Smart Working: opportunità o minaccia? La parola ai professionisti. *Prospettive in Organizzazione*, 13, 1-5.
- Edmunds, A., & Morris, A. (2000). The problem of information overload in business organisations: a review of the literature. *International Journal of Information Management* 20 (2000) 17-28
- Eurofound (2020). *Living, working and COVID-19, COVID-19 series*, Publications Office of the European Union, Luxembourg.
- Fana, M., Tolan, S., Torrejon Perez, S., Urzi Brancati, M.C. and Fernandez Macias, E., (2020). The COVID confinement measures and EU labour markets, EUR 30190 EN 30190 IT, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-18812-4, doi:10.2760/079230, JRC120578.
- Grant, C. (2020). Concepts, Terms and Measurement in Agile Working. *Agile Working and Well-Being in the Digital Age*, 19-32.
- Hitchcock, A., Laycock, K., & Sundorph, E. (2017). Work in progress. Towards a leaner, smarter public-sector workforce. (Available at: <https://reform.uk/sites/default/files/2018-10/Work%20in%20Progress%20Reform.pdf>).
- ISTAT (2020). *Monthly Report on the Italian Economy – March, April, June 2020*, Istat, Rome, 2020.
- Jeyasingham, D. (2020). Entanglements with offices, information systems, laptops and phones: How agile working is influencing social workers' interactions with each other and with families. *Qualitative Social Work*, 19(3), 337-358.
- Krishnakumar, S., & Choudhury, J. (2014). Understanding the nuances of work-life balance. *Review of HRM*, 3, 81.
- Niles, J. M. (1998). *Teleworking: Strategies for Managing the Virtual Workforce*. New York, NY Wiley.
- Mancl, D., & Fraser, S. D. (2020, June). COVID-19's influence on the future of agile. In *International Conference on Agile Software Development* (pp. 309-316). Springer, Cham.
- Margherita, E. G., & Braccini, A. M. (2021). Exploring the socio-technical interplay of Industry 4.0: a single case study of an Italian manufacturing organisation. arXiv preprint arXiv:2101.05665.
- Marović, I., & Bulatović, G. (2020). Development of a Hybrid Agile Management Model in Local Self-Government Units. *Tehnički vjesnik*, 27(5), 1418-1426.
- Mergel, I., Ganapati, S., & Whitford, A. B. (2020). Agile: A New Way of Governing. *Public Administration Review*, 81(1), 161-165.
- Milasi, S., González-Vázquez, I., Fernández-Macías, E. (2020). Telework in the EU before and after the COVID-19: where we were, where we head to. *The COVID*

- & Empl Working Group composed by researchers from the JRC, Eurofound, Cedefop and EU-OSHA.
- Mohr, B. J., & van Amelsvoort, P. (2016). Mumford, E. 2006. The Story of Socio-technical Design: Reflections on Its Successes, Failures, and Potential. *Information Systems 16. Co-Creating Humane and Innovative Organizations*, 98.
- OECD (2020a). Evaluating the initial impact of COVID-19 containment measures on economic activity, Economics Department, OECD, Paris.
- OECD (2020b). Supporting people and companies to deal with the Covid-19 virus: options for an immediate employment and social-policy response, ELS Policy Brief on the Policy Response to the Covid-19 Crisis, OECD, Paris.
- Pasmore, W., Winby, S., Mohrman, S. A., & Vanasse, R. (2019). Reflections: socio-technical systems design and organization change. *Journal of Change Management*, 19(2), 67-85.
- Phillips, S. (2020). Working through the pandemic: Accelerating the transition to remote working. *Business Information Review*, 37(3), 129-134.
- Purser, R., & Pasmore, W. (1993). Designing knowledge work systems. *Journal of Quality and Participation*, July-August, 78–84.
- Sony, M., & Naik, S. (2020). Industry 4.0 integration with socio-technical systems theory: A systematic review and proposed theoretical model. *Technology in Society*, 61, 101248.
- Raguseo, E., Gastaldi, L., & Neirotti, P. (2016). Smart work: Supporting employees' flexibility through ICT, HR practices and office layout. In *Evidence-based HRM: A Global Forum for Empirical Scholarship*, 4(3), 240-256. Emerald Group Publishing.
- Rapaccini, M., Saccani, N., Kowalkowski, C., Paiola, M., & Adrodegari, F. (2020). Navigating disruptive crises through service-led growth: The impact of COVID-19 on Italian manufacturing firms. *Industrial Marketing Management*, 88, 225-237.
- Rosen, L. & Samuel, A. (2015). Conquering Digital Distraction. *Harvard Business Review*, June 2015 issue, 110-113
- Rymkevich, O. (2018). An Overview of the Regulatory Framework for Smart Work in Italy: Some Critical Remarks. *Kutafin University Law Review*, 5(1), 46-64.
- Sarti, D., & Torre, T. (2017). Is Smart Working a Win-Win Solution? First Evidence from the Field. *Well-being at and through Work*, 9, 231.
- Schenk, B., & Dolata, M. (2020). Facilitating digital transformation through education: A case study in the public administration. In *Proceedings of the 53rd Hawaii International Conference on System Sciences*.
- Schmidtner, M., Doering, C., & Timinger, H. (2021). Agile Working during COVID-19 Pandemic. *IEEE Engineering Management Review*.
- Sullivan, C. (2003). What's in a name? Definitions and conceptualisations of teleworking and homeworking. *New Technology, Work and Employment*, 18(3), 158-165.
- Sutcliffe, A. G. (2000). Requirements analysis for socio-technical system design. *Information Systems*, 25(3), 213-233.

- Torre, T., & Sarti, D. (2019). Themes and Trends in Smart Working Research: A Systematic Analysis of Academic Contributions. In HRM 4.0 For Human-Centered Organizations. Emerald Publishing Limited.
- Yu, R., Burke, M., & Raad, N. (2019). Exploring impact of future flexible working model evolution on urban environment, economy and planning. *Journal of Urban Management*, 8(3), 447-457.
- Yurtseven, M. K., & Buchanan, W. W. (2013, March). Socio-technical system design: a general systems theory perspective. In Proc. The International Conference on Engineering and Computer Education-ICECE'2013.