Available online at www.sciencedirect.com

ScienceDirect

IFAC PapersOnline CONFERENCE PAPER ARCHIVE

IFAC PapersOnLine 55-2 (2022) 505–510

Industrial Smart Working: a socio-technical model for enabling successful implementation

Chiara Cimini*, Sergio Cavalieri*

** Department of Management, Information and Production Engineering, University of Bergamo, Italy (e-mail: chiara.cimini@unibg.it, sergio.cavalieri@unibg.it).*

Abstract: With the spread of the COVID-19 pandemic, many companies have been pushed to re-think their traditional working models to comply with the need for social distancing. In this context, Smart Working practices have been proposed to re-arrange the workforce activities ensuring the minimization of risks as well as business continuity. Despite traditionally most of the smart working practices have been applied to white collars job profiles, the COVID-19 pandemic opened the way to the introduction of Smart Working practices also in the factory environments, introducing the concept of Industrial Smart Working (ISW). This paper aims at contributing to the development of the concept of ISW proposing a socio-technical model discussing the main enabling factors that can support the successful industrial implementation of time and space flexible working models.

Keywords: smart working, agile working, socio-technical system, work organization, flexible work.

1. INTRODUCTION

In the last years, with the spread of the COVID-19 pandemic, the concepts of Smart Working and Agile Working, used as synonyms, have been the focus of several articles, debates, round tables, and observatories. Indeed, the health emergency linked to the Coronavirus, first with the lockdown and then with the stringent regulations and constraints on social distancing, has forced many companies to review the models of management and organization of work and re-arrange the daily workforce activities to ensure the minimization of the risks related to the virus spread (Gonçalves et al., 2021).

The term Smart Working (SW) refers to agile and flexible working models that already existed and were fairly widespread in the office work and service industries, even before the health emergency. These work models originated typically for management and "desk" tasks; however, with the healthcare emergency, more and more companies needed to extend these practices to other roles as well. Many manufacturing companies, in fact, in order to prevent production losses and ensure the continuity of their business activities, have been forced to adapt to the restrictions by rethinking organizational models, management of processes and workers (Stofberg et al., 2021).

However, if an office worker, typically referred also as a *white collar*, can be put in a position to work from any place and at any time in a relatively simple way, currently, this does not happen for *blue collar* workers, namely factory job profiles. In fact, the tasks and work activities of this kind of operator are usually strictly dependent on machines, production lines and plants, i.e. concrete physical entities that cannot be relocated. Since the term Smart Working is often considered only as "remote work", it is really difficult to envision potential adoption in factory environments; for this reason, it is crucial to remark that the adoption of Smart Working practices does not only involve the execution of work activities from home or from any other place that is not the company headquarters. The main issue in the definition of Smart Working is that it is often erroneously associated with working practices that are not based on the principles of flexibility, autonomy and empowerment of the worker, but that simply concerns the performance of work activities from home according to the normal working hours (Senatori & Spinelli, 2021).

Therefore, in order to better point out this phenomenon, the first objective of this research is to clarify and give a definition of what is meant by Industrial Smart Working (ISW), which represents the industrial application of agile working practices to factory job profiles, based on the analysis of scientific and grey literature as well as related laws. Since the concept of ISW suggests the adoption of managerial approaches based on giving people the flexibility and autonomy to choose the spaces, time and tools to be used to carry out their work, against a greater responsibility of the worker in achieving the objectives assigned to him, it represents a multifaceted and multidisciplinary phenomenon. Indeed, it involves different dimensions of the work organization and business environment, which could act as enabling and facilitating factors for the introduction of these practices as well as barriers to successful implementation. Nevertheless, literature lacks of complete and systematized frameworks that describe all the main dimensions of ISW and can be useful to practitioners to introduce such practices in industrial contexts.

To this purpose, the second objective of this paper is to develop and define a Socio-Technical Model (STM) that includes the most relevant dimensions that could facilitate the introduction of models of work flexibility, empowerment and autonomy for factory workers. The proposed framework grounds on the theory of socio-technical systems, which postulates the integration of technical and social components for supporting organizations in adapting to changes. Since

10.1016/j.ifacol.2022.04.244

technologies alone are not sufficient to deal with paradigm shifts, such as the ones brought by the fourth industrial revolution of from the COVID-19 pandemic, it is necessary to consider the characteristics of the relational structure among the members of the organization, their perceptions of roles, modes of coordination and social and individual needs.

The paper is organized as follows. In Section 2, the concept of Smart Working is defined, based on literature analysis and scrutiny of the current legislation. In Section 3, the ISW concept is introduced, while Section 4 presents the three main dimensions that characterize the Socio-Technical Model of enabling factors for ISW implementation. Section 5 presents a discussion and concludes the paper with limitations and future research directions.

2. FUNDAMENTALS ON SMART WORKING

2.1 Origin of the concept

Generally, the terms Smart Working and Agile Working, considered as synonyms, are used to indicate new models of work organization able to bring significant benefits to the organizations that adopt them in terms of productivity, achievement of business objectives, but above all in terms of welfare and quality of life of the workers.
However, to date, the concepts of Smart Working or Agile Working, have not been well defined or they are mistakenly used to refer to practices that are in some ways similar, but in reality very different, such as Teleworking or Remote Working (Zappalà et al., 2021). For instance, Hopkins & McKay (2019), in their study, refers to "working anywhere" to describe the possibility conducting working activities outside of the traditional office and workplace. Seeking to find a definition for the concept of Smart Working, it emerged that originally two main perspectives existed. The first considered the SW as a completely novel topic, which referred mainly to working outside conventional workplaces thanks to telecommunication and computer-based application; the latter deemed the SW as a natural evolution and innovative approach in the work organization domain (Torre & Sarti, 2019).

According to Crespi (2019), SW represents a new approach to the way of working and collaborating within a company that is based on four fundamental pillars: the revision of the organizational culture, the flexibility concerning working hours and places, the use of technological equipment and the revision of physical spaces. The first fundamental pillar concerns the managerial style, which mainly needs to be based on work by objectives. The relationship between the manager and the employee must also be revised, since adopting SW practices gives the employee more and more autonomy, moving from control to trust. The second pillar concerns the definition of company policies that guarantee more flexibility about working hours and places. Technological equipment is, therefore, the third fundamental pillar, being the tool that supports and enhances flexibility. The fourth fundamental pillar concerns physical spaces: these ones, in fact, must evolve to be able to support the different needs of people; company layouts must be rethought in order to have workstations and shared spaces in which people can effectively carry out their activities, benefiting from the services available to them.

Also in Gastaldi et al. (2014), the SW is defined as a set of "non-conventional organizational models that are characterized by higher flexibility and autonomy in the choice of working spaces, time and tools, and that provides all employees of an organization with the best working conditions to accomplish their tasks". A more holistic view is contained in McEwan (2016) where, besides the flexibility of working time and space, the Smart Working is supposed to encompass psycho-social attitudes to work and relationships, with a necessary adoption of a "smart mindset" to be successful.
All the definitions provided in the literature, therefore, converge on two essential aspects: first, the need to give flexibility and autonomy to workers; second, the main aim of SW is the enhancement of the workers' wellbeing and work-life balance, without losing productivity.

2.2 Regulations

The Italian Law about the Agile Working ((Law n° 81, 2017)) defines the SW as a "manner of execution of the paid employment relationship established by agreement between the parties, even with forms of organization by phases, cycles and objectives and without precise constraints of time or place of work, with the possible use of technological tools for the development of the working activity". Therefore, the law allows the worker to carry out the working activities partly inside the company boundaries and partly outside without a fixed location, but respecting the limits of the maximum duration of daily and weekly working hours.

Similar policies of flexibility in the execution of work are spreading throughout Europe, even if different regulations and different terminologies are used, such as Flexible Working in UK and Netherland, Agile Working in Germany, Flexible Telework in France or New Ways of Working in Belgium. In 2016, the European Parliament itself affirmed to support Agile Work with the resolution of September 13th. The general principle n.48 of the resolution, in fact, highlighted the social benefits of Agile Work, stressing the importance of work-life balance to support demographic recovery, preserve social security systems and promote the well-being and development of individuals and society as a whole.

Indeed, generally, the adoption of such organizational models aims at a better work-life balance between the enterprise objectives of competitiveness and the needs of individuals. Often, mistakenly, the term Smart Working is assimilated to Teleworking. Nevertheless, Teleworking is a form of work contract defined in 2002 by an EU framework agreement, which consists mostly in moving the place of work and is not based on the principles of flexibility, autonomy and responsibility. The rules imposed for Teleworking are rigid: time, places and technological tools are pre-established and reflect the organizational structure used in the workplace.

2.3 Smart Working in the COVID-19 era

The interest about the Smart Working practices is relatively recent. Searching the terms "Smart Work*" OR "Agile Work*" on the Scopus database, it has been possible to find

that an increasing number of articles has been published starting from the 2000. Nevertheless, the COVID-19 pandemics gave a substantial boost to the research in the field, as it is possible to see in Figure 1. Also considering the industrial implementation, for example in Italy, before the COVID-19 pandemic, only the 4.8% of workers were allowed to exploit a flexible working model, e.g. performing activities permanently or occasionally by home (Assolombarda, 2021).

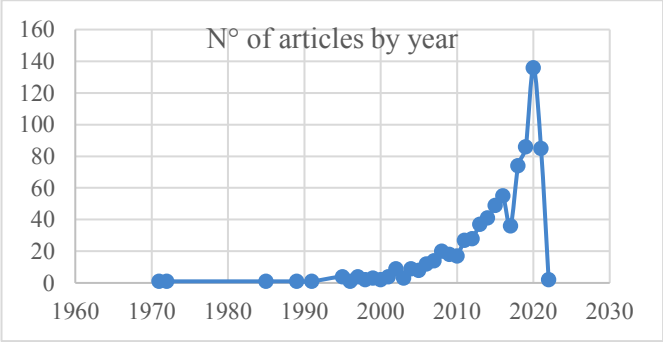

Figure 1. N° of articles related to "Smart Work" OR "Agile Work" in the Scopus database

According to the Smart Working Observatory of the Politecnico di Milano, during the COVID pandemic, 97% of large enterprises, 94% of the public administrations and 58% of the SMEs adopted SW practices, involving more than 6,5 million workers, i.e. ten times the number of involved workers in 2019 (Smart Working Observatory, Politecnico di Milano, 2021).

Indeed, it is possible to see the COVID-19 pandemic in a crisis-opportunity perspective (Hu, 2020) since it contributed to raise awareness and promote advancement in the work organization and workers' empowerment. Moreover, if previous studies and industrial implementations were mainly related to administrative job profiles, the COVID-19 pushed companies to rethink the working activities of all the enterprises' job positions, opening the door to the concept of ISW, which will be the focus of the next section.

3. INDUSTRIAL SMART WORKING

As suggested by the above-mentioned definitions, the most widespread model of Smart Working involves the possibility for employees to work remotely and therefore concerns the percentage of the company's population whose tasks and activities can be carried out in places outside the company's boundaries, i.e. *white collar* workers.

Nevertheless, considering Smart Working models not only a mere remote work, it is possible to envision the application of SW practices also to the workers' population made up of *blue collars*. The term Industrial Smart Working refers to all the SW methods and practices employed to enable flexible working activities for factory job profiles, such as the ones working in the production, logistics and maintenance.

In order to really practice and introduce Smart Working modes, it is necessary to undertake a path of transformation of the organization and the way people experience work, focusing on changes in the internal organization and management of human and technological resources (Crespi, 2019). In this sense, SW is not only an executive and operational mode, but it provides the worker with an "entrepreneurial" approach and mentality resulting from individual autonomy and responsibility in managing activities and achieving results (Casini, 2020). According to Lund et al. (2020), in fact, the possibility to adopt SW depends on the mix of activities undertaken by a worker, as well as the physical, spatial and interpersonal factors related to them.

For this reason, ISW practices can be successfully applied also in those job profiles where remoting in the strict sense of the term cannot be achieved. Considering the factory level, indeed, the ecosystem of technologies related to Industry 4.0 can become a decisive advantage in defining new ways of production and work, always keeping the worker at the center of the production process. The technologies that enable the new paradigms of Industry 4.0, such as augmented/virtual reality and intelligent machines, in fact, should not reduce the human contribution to production processes but should facilitate and support it according to new schemes and collaborative working methods (Cimini et al., 2020). The concept of Human Centric Industrial Smart Working (HCISW) emerges as the set of methods and technologies that can enable the management and execution of operational processes (e.g., production advancement, quality control, maintenance control, execution of logistical activities within the plant,...) remotely and the set of changes in the Socio-technical System (people, work organization, technologies and processes) to make operational processes more flexible, reconfigurable and safer while maintaining high productivity (MADE Competence Center, 2020).

Technologies play a crucial role in making flexible the working activities related to production, but they will not be sufficient to enable a profitable implementation of ISW practices in terms of both productivity and workers' wellbeing. To do so, a mix of technological, organizational and human factors need to be considered, in order to promote the evolution of the factory work towards more flexible models.

4. A SOCIO-TECHNICAL MODEL FOR ADOPTING INDUSTRIAL SMART WORKING

Since SW is a socio-technical phenomenon involving different dimensions of the enterprise, all the cultural and organizational models, technologies, as well as roles and tasks have an important impact on the suitability of ISW practices in the different production environments. For this reason, in this research, the ISW has been approached according to the Human-Technology-Organization model (Dregger et al., 2016), which suggests these three dimensions as a way to describe and analyze the evolution of a socio-technical context, as ISW is. Based on the critical analysis of multidisciplinary literature covering both the organizational domain, the digital technologies and the human factors in the production, we provide a Socio-Technical Model containing the enabling factors for the ISW (Figure 2), whose dimensions are described in detail in the following subsections.

4.1 Organization

From the literature analysis, it emerged that, generally, SW practices requires an organization characterized by flexibility, agility, empowerment, and decentralization. Agility and flexibility are key attributes in defining a smart organization:

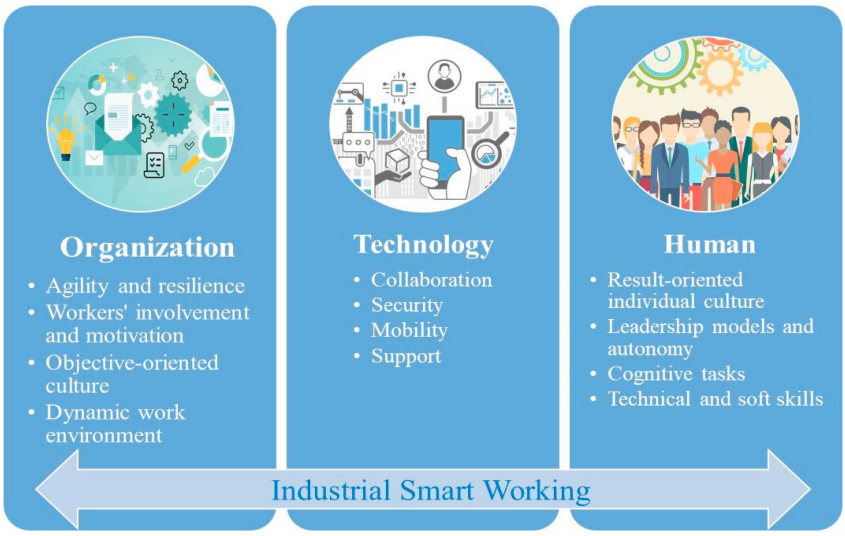

Figure 2. Socio-Technical Model for Industrial Smart Working

for a production system to be flexible, agile and able to respond reactively to the changing environment, decision-making processes and organizational models must be lean. As a result, flatter structures and decision-making at lower levels enhance significantly the productivity and efficiency of the organization. Lean organizations are more facilitated in responding effectively to difficulties, challenges and changes, proving resilience. Indeed, resilience is a characteristic element of the ISW paradigm. From one side, it represents an enabling factor, since it allows the seamless transition towards new working paradigms that require totally new organizational mindsets and practices, from the operational sphere up to the managerial levels. On the other side, resilience can be seen as one of the results of the successful implementation of ISW, enabling better adaptability of the work organization to the disruptions, such as the COVID-19 pandemic.

Essential components of resilience and reconfigurability are participatory organizational models, in which the involvement of workers in continuous improvement and innovation activities is fundamental. In these contexts, employees and workers are fully involved and contribute to the design and configuration of the system to appropriately meet their needs and constraints. In this perspective, fundamental elements for the adoption of SW methods are communication, information sharing and transparency. In particular, it is important that all individuals (managers, employees and collaborators) are involved in the strategic objectives.

From the mindset perspective, the corporate culture must be oriented towards results and objectives; managerial styles must be consistent with the definition of work by objectives and the relationship between manager and employee must no longer be based on control, but rather on trust. It is, therefore, necessary to redefine the span of control of the different job profiles.

From the analysis of the literature, it also emerges that another important aspect for the development of successful smart initiatives is the work environment: this must be dynamic and flexible. Physical spaces must be re-thought in order to be functional for carrying out several activities according to the needs of employees, and forms of work organization must be characterized by the use of teams and job rotation. The productive systems and the organizational policies of spaces and times of work must be defined trying to guarantee the maximum spatial and temporal flexibility both for the systems and for the individuals. To do so, it is necessary to introduce suitable technologies for digitizing document management, automating processes and standard operating procedures, as well as digitalizing workflows, automating logistics and customer support processes.

In order to introduce successfully ISW initiative, therefore, a strong commitment is required in motivating and training workers to provide them with proper skills and tools as well as to promote a climate of openness to change and innovation. In particular, human resources managers need to encourage proactive attitudes from their employees, also implementing initiatives for the public valorization of the employees' improvement ideas.

Finally, from an organizational perspective, companies are responsible for IT implementation and management. Together with the introduction of specific digital tools that will be detailed in the next subsection, the organization is responsible for the technological infrastructure, the definition of policies, the training of people on new technologies and behaviors and the assessment of technological adequacy.

4.2 Technologies

Along with organizational aspects, the implementation of the right technologies can facilitate the adoption of new working models. Indeed, the digitalization and automation of the production processes, as well as the emergence of integrated and collaborative production systems gives the possibility to support ISW practices also in manufacturing environments.

In order to adopt working models based on spatial and temporal flexibility, it is necessary to recognize the importance and value of data and information communication and sharing. The enabling technologies for ISW activities must cover the following areas:

- Collaboration: to support communication and sharing of information and collaboration between individuals;
- Security: to ensure accessibility and security to the flow of data;
- Mobility: to free the way of working from the idea of fixed locations and times;

- Support: to improve the productivity and working conditions of employees.

Concerning the last point, the introduction of integrated and collaborative production systems are essential elements to support and enhance human work through the augmentation of human capability and, at the same time, to introduce models of ISW also in the shop floor, i.e. for operators who normally work and collaborate with machines.

Table 1 shows the main technologies that enable and facilitate working practices characterized by spatial and temporal flexibility. Some of them, such as IoT and Cloud computing provides information available remotely, anytime, from anywhere, ensuring at the same time data resilience and security. Other technologies mainly aim at enabling remote operations, such as augmented reality for maintenance and training, contributing also to reduce human error. Finally, collaboration is boosted by the Information Systems, such as ERP and MES, which support the operators in coordinating the production planning and control and synchronizing operations according to flexible work organization schemes.

Table 1. Enabling Technologies for ISW

Technologies	*Collaboration*	*Security*	*Mobility*	*Support*
IoT			X	
Big Data Analytics/AI			X	X
Cloud		X	X	
Simulation	X			X
Augmented Reality			X	X
Virtual Reality	X			
Advanced/ Collaborative Robotics			X	X
Wearable Devices		X		X
Information systems for horizontal/ vertical integration	X		X	X

4.3 Human

The last dimension of the Socio-Technical Model for ISW concerns the human factor since workers are the real actors and promoters of change. In order to be able to deal with change, specific technical, methodological, personal and interpersonal skills are required, which differ according to the professional figure being considered.

First, successful change requires a results-oriented individual culture and a strong personal motivation to achieve the organization's goals. Workers at any level must be able to collaborate and interact with all elements of the system, being responsible for their own tasks and the achievement of their own goals, but able to manage work teams as well.

Concerning managerial figures, to implement ISW, literature agrees that new models of leadership must be developed. The figure of the manager who strictly controls and organizes the activities of employees must be replaced by the figure of a charismatic leader who inspires, involves and motivates employees, leaving them more freedom for self-management and decision-making power. ISW practices require an organizational and managerial culture that supports trust, autonomy, open-mindedness and goal orientation. This implies that workers are required to be more proactive and creative in managing their job.

If job profiles generally classified as *white collar*, carrying out administrative, managerial and planning activities, are fairly facilitated in the adoption of SW models, they still need suitable technological devices and infrastructure.

At the factory level, even if more challenging, the adoption of flexible work models in terms of space is possible thanks to technological innovation, automation, advanced robotics and sensorized smart machines that lead to a broadening and enrichment of the tasks and activities for which operators are responsible. Indeed, introducing ISW depends on the types of involved tasks and duties, the role of technologies, interactions with the system and the necessary skills.

Since the tasks of the operators can be classified according to whether they are repetitive or not, codifiable and standardizable or not, cognitive or manual, individual or social, different evolutions in the factory job profiles can be envisioned and, as a consequence, different ISW practices can be enabled, also in relation to the division of tasks between men and machines. In particular, the introduction of digital technologies in the factories are pushing operators to undertake several new cognitive activities, both concerning the monitoring/supervision of equipment and troubleshooting or problem-solving actions. For this reason, different degrees of spatial and/or temporal flexibility can be introduced. For instance, in the case of cognitive activities, such as data analysis or report writing, it is possible to achieve discrete levels of spatial and temporal flexibility: the operator can carry out these activities without necessarily being bound to specific working hours and not directly in the production workstation. For even manual tasks that are carried out in teams, perhaps the constraint of the workplace cannot be made flexible, but the group of operators involved could autonomously manage the activities and times to achieve the objectives. Moreover, monitoring activities, thanks in part to the spread of sensorized machines and smart products, can be carried out with significant spatial and temporal flexibility, like assembly and maintenance activities thanks to the use of virtual and augmented reality.

Other aspects, such as the ability to perform multiple collaborations with other workers and an interconnected production environment, together with adequate technological and soft skills, are crucial to support ISW initiatives and take advantage of their benefits.

5. DISCUSSION AND CONCLUSIONS

The Socio-Technical Model proposed in the previous section involves human, organizational and technological factors with the aim of understanding which characteristics are necessary to work according to the principles of autonomy, flexibility and empowerment as well as which technological tools are indispensable to be able to give greater spatial and/or temporal flexibility to workers in carrying out their work. Despite the adoption of ISW practices can be considered challenging, since it requires a complete paradigm shift in the factory work organization, new technologies are essential tools

to release the operator from a fixed workplace, promoting the increase of the cognitive content of tasks that could be managed with greater autonomy and performed with a certain spatial and temporal flexibility. Moreover, ISW implementation can start from all augmented and virtual reality tools and smart wearable devices that enable remote monitoring, diagnostics, control, maintenance, testing, installation and training. Given these premises, the implementation of ISW practices results to be easier in smart factory environments. At the same time, some factory activities, in which the man-machine work cannot be decoupled and the physical presence of the operator on the machine cannot be remote-controlled, could be re-organized in order to make the operator able to manage working hours autonomously, through asynchronous work schedule with respect to the production flow. Flexible working hours could mainly be applied in activities upstream or downstream of the production system, such as input and output quality control.

The proposed STM was defined by analyzing literature and it is, therefore, a purely theoretical model that, inevitably, must be evaluated, consolidated and validated. Considering the manifold industrial and manufacturing contexts, the described enabling factors cannot have the same role and importance in every production system and organization. Then, further research on ISW will focus on the validation of the proposed model according to the discussion with industrial stakeholders. Indeed, it may be assumed that depending on different company characteristics (size, industrial sector, type of products and processes, organizational structure, corporate culture, etc.), the implementation of different forms of flexible work models can be adopted. To do so, a deeper investigation will be done involving human resource and operations managers of manufacturing and process companies.
Given the complexity and multidisciplinary nature of the phenomenon, further research could also be devoted to the development of a maturity or readiness assessment model, able to evaluate how different levels of technological, organizational, social and cultural factors can enable or at least facilitate ISW implementation.

REFERENCES

Assolombarda. (2021). *Lo smart working in numeri*. https://www.assolombarda.it/centro-studi/smart-working-2021

Casini, S. (2020, May 25). Industrial Smart working: I 6 passi fondamentali per sfruttarne tutti i vantaggi. *Innovation Post*. https://www.innovationpost.it/2020/05/25/industrial-smart-working-i-6-passi-fondamentali-per-sfruttarne-tutti-i-vantaggi/

Cimini, C., Lagorio, A., Romero, D., Cavalieri, S., & Stahre, J. (2020). Smart Logistics and The Logistics Operator 4.0. *IFAC-PapersOnLine*, *53*(2), 10615–10620.

Crespi, F. (2019). *Smart Working: Cosa significa e perché è così importante?* https://blog.osservatori.net/it_it/cosè-lo-smart-working

Dregger, J., Niehaus, J., Ittermann, P., Hirsch-Kreinsen, H., & ten Hompel, M. (2016). The digitization of manufacturing and its societal challenges: A framework for the future of industrial labor. *Ethics in Engineering, Science and Technology (ETHICS), 2016 IEEE International Symposium On*, 1–3.

Gastaldi, L., Corso, M., Raguseo, E., Neirotti, P., Paolucci, E., & Martini, A. (2014). *SMART WORKING: RETHINKING WORK PRACTICES TO LEVERAGE EMPLOYEES' INNOVATION POTENTIAL*. 11.

Gonçalves, S. P., Santos, J. V. dos, Silva, I. S., Veloso, A., Brandão, C., & Moura, R. (2021). COVID-19 and People Management: The View of Human Resource Managers. *Administrative Sciences*, *11*(3).

Hopkins, J. L., & McKay, J. (2019). Investigating 'anywhere working' as a mechanism for alleviating traffic congestion in smart cities. *Technological Forecasting and Social Change*, *142*, 258–272. https://doi.org/10.1016/j.techfore.2018.07.032

Hu, R. (2020). COVID-19, smart work, and collaborative space: A crisis-opportunity perspective. *Journal of Urban Management*, *9*(3), 276–280.

Law n° 81. (2017). *Misure per la tutela del lavoro autonomo non imprenditoriale e misure volte a favorire l'articolazione flessibile nei tempi e nei luoghi del lavoro subordinato*. https://www.gazzettaufficiale.it/eli/id/2017/06/13/17G00096/sg

Lund, S., Madgavkar, A., Manyika, J., & Smit, S. (2020). What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries. *McKinsey Global Institute*, 1–13.

MADE Competence Center. (2020). *Industrial Smart Working*. https://www.made-cc.eu/webinar/%22industrial-smart-working%22

McEwan, A. M. (2016). *Smart Working: Creating the Next Wave*. CRC Press.

Senatori, I., & Spinelli, C. (2021). (Re-)Regulating Remote Work in the Post-pandemic scenario: Lessons from the Italian experience. *Italian Labour Law E-Journal*, *14*(1), 209–260.

Smart Working Observatory, Politecnico di Milano. (2021). *Smart working post lockdown: Il New normal*. https://www.osservatori.net/it/ricerche/comunicati-stampa/smart-working-emergenza-covid19-new-normal

Stofberg, L., Strasheim, A., & Koekemoer, E. (2021). Digitalisation in the Workplace: The Role of Technology on Employee Engagement and Creativity Teams. In N. Ferreira, I. L. Potgieter, & M. Coetzee (Eds.), *Agile Coping in the Digital Workplace: Emerging Issues for Research and Practice* (pp. 231–257). Springer International Publishing.

Torre, T., & Sarti, D. (2019). Themes and Trends in Smart Working Research: A Systematic Analysis of Academic Contributions. In *Advanced Series in Management* (pp. 177–200). Emerald Publishing Limited.

Zappalà, S., Toscano, F., & Topa, G. (2021). The Implementation of a Remote Work Program in an Italian Municipality before COVID-19: Suggestions to HR Officers for the Post-COVID-19 Era. *European Journal of Investigation in Health, Psychology and Education*, *11*(3), 866–877.