

Embracing change and supporting transitions

APPROACHES TO SYSTEMIC CHANGE
IN PRODUCTS, SERVICES AND SYSTEMS

Edited by
Stefana Broadbent and Silvia D. Ferraris

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4. Design for well-being at work: ethical issues, opportunities and research perspectives

Margherita Pillan, Isabella Ruina

The design discipline is evolving as a result of multiple tensions, including contemporary social, environmental, political, and economic global transformations. Designers are developing a new awareness of their important role in the search for solutions for complex problems requiring articulated actions, including cultural changes, redesign of services, and creation of new socio-technical systems. Notably, the evolution of digital technologies, including data collection and processing through machine learning and artificial intelligence, opens promising innovation of all social systems and offers the opportunity to develop new approaches for the goals of sustainable and inclusive development aimed at the prosperity of people and planet.

Designers can play an important part in addressing innovation towards progress. In the social dialogue that should accompany the transformation and the generation of solutions for complex problems, design – as a discipline, realm of knowledge, and professional knowhow – relies on: consolidated and specific skills such as design research and user studies; the ability to create shared languages within multicultural project contexts; and problem-solving.

This expertise is associated with the practical capabilities of developing prototypes and demonstrators supporting the exploration of highly innovative scenarios and enabling the validation or questioning of new proposals through verification actions. Envisioning new scenarios and creating a common platform for inclusive projects requiring the collaboration of multiple stakeholders is a key design competence for developing innovative socio-technical systems. Assessing the feasibility, testing the acceptability, and predicting the short- and long-term impacts of innovative solutions are fundamental tasks when dealing with systems that affect people's lives, such as those dedicated to health and well-being. User-centred design approaches allow the optimization of material and intangible solutions from the point of view of end users and the identification of features that could threaten people's rights. Anticipating and managing possible issues that may arise from digital solutions that involve collecting and processing personal data is a core task that designers can manage.

These capabilities enable designers to become main actors in transforming several social systems; among other research fields, designers are acquiring an expanding role in developing new approaches to health care and prevention.

The research reported in this document aims at developing new approaches for the investigation of well-being and sources of stress in working environments, and the document summarizes the preliminary results of a multidisciplinary activity aimed at developing new solutions for the collection of data on lifestyles and the factors that can have an impact on workers' health. More specifically, the document provides preliminary theoretical research on healthiness in contemporary work contexts, focussing on office work. Also, this research explores how recent transformations (i.e., technological revolution, globalization, and the climate crisis) have impacted the work context, spreading a sense of uncertainty reflected in workers' well-being.

The study was developed as a research activity for MUSA, an Innovation Ecosystem funded by the Ministry of University and Research as part of the National Recovery and Resilience Plan (MUSA – Multilayered Urban Sustainability Action – project, funded by the European Union – Next Generation EU, under the National Recovery and Resilience Plan (NRRP) Mission 4 Component 2 Investment Line 1.5:

Strengthening of research structures and creation of R&D *innovation ecosystems*, set up of *territorial leaders in R&D*).

Since working environments and organizations are currently going through a tremendous transformation, new research on the impacts of contemporary work conditions on the physical and mental well-being of workers is needed. The MUSA project tries to respond to this necessity, with a specific focus on office work and on the possible risks of health endangerment due to the organization's present activities. The general aim is to identify suitable strategies for the investigation of problems and solutions to work-related health issues, compatible with the sensitivity of collecting personal data in working contexts. In this, several dimensions are included: physical and mental well-being; digital well-being; co-design of solutions for well-being and stress prevention.

The definition of suitable strategies has its roots in the preliminary analysis of the multiple factors influencing health and well-being in the working environment, highlighting specific points of attention requiring further investigations.

Work is what humans do to produce goods and solutions for survival and prosperity; and the diversification of professional roles in society corresponds to the construction of complex social organizations exploiting human capabilities. It has various forms – from highly professionalized and specialized work to unacknowledged and hidden activities, such as domestic work for the care of people and homes – and it is the infrastructure for all social systems.

Work is also fundamental for the sustainable development of countries. It is a reference for the Sustainable Development Goals (SDGs) in the ONU Agenda 2030 – for example, for Goals 1 and 5 – and the specific focus of Goal 8 addressing «inclusive and sustainable economic growth, full and productive employment and decent work for all».

Work's multifaced nature reflects also on the meaning associated with it. According to the European Values Study (2008) the concept of work for Europeans includes three different dimensions: first, the *ethic of duty*, which means the moral duty people feel towards society; second, the *instrumental dimensions*, meaning work as the means by which people obtain some benefits; and finally, the *expressive dimension*, also called post-materialistic and related to the sense of

self-fulfilment that people can reach through work. Ensuring well-being at work is relevant for social inclusion, social justice, health expectations of individuals, and the efficiency of the economic system, impacting the productivity of organizations (Misra and Srivastava, 2023). The term *well-being* and *mental health* are sometimes wrongly considered to be synonymous, but it is important, for the scope of this research, to make a distinction.

According to the World Health Organization (WHO): *Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community. It has intrinsic and instrumental value and is integral to our well-being.* This definition explains how well-being is a subcategory of the general concept of mental health.

4.1 Evolution of work and work-related issues impacting well-being

We are today facing significant and rapid changes which are reshaping our societal landscape, exemplified by phenomena such as globalization, radical advances in technologies and automation, and the climate crisis. These widespread transformations impact working scenarios and organizations, while the social meaning of work itself changes throughout the years.

Studies examining pre-economic societies reveal a lack of uniformity in defining *work* (Chamoux, 1994). While the value of labour gradually emerged during the Middle Ages, the term itself only began to be associated with productive activity in the 17th century (Méda, 2017). By the 18th Century, the term *work* crystallized, thanks to the conceptual detachment between workers and the commodities produced. However, work was still regarded as an activity and continued to resonate as something similar to a sacrifice (Smith, 2002). This idea changed at the start of the 19th century when work became the *essence of humanity*, the place where people can channel their potential and transform the world through their actions.

In the 20th century, another metamorphosis took place, distancing work from its negative connotation and embracing two new positive

meanings: as the way to obtain some benefits; and, more importantly, as the means by which people can achieve self-fulfilment, demonstrate their personal capabilities to the world, and feel represented by their *social status* (Castel, 1995). In the 21st century, as a consequence of post-Taylorism and the progressive relevance of subjectivity in the job, work becomes an opportunity to perform. Hence, the modern idea of work includes all these different meanings: a factor of production; the essence of humanity; and the means of assuring our wealth, benefit, and protection.

Considering the evolution of work and its organization paradigms, technological innovation is a crucial factor impacting processes, environments, activities, and skill requirements. Digital and Information and Communication Technologies (ICTs) are the main leverage for transforming economies and the employment market.

In office work, ICTs opened new ways to personalize work modalities and potentially produce more inclusive work conditions. Moreover, digital tools promote flexibility which brings work-management autonomy (Bordi *et al.*, 2018). The sad fact is that autonomy can be just an illusion, resulting in a controlled system of rewards and punishments for individual performance which pulls the strings of the work experience.

Collaboration at a distance, work from home, and work schedule flexibility find their counterpart in the crumbling of the division between life and work, on a mental and practical level (Bordi *et al.*, 2018).

This introduced the term *technostress*, defined as a specific type of work stress that can cause anxiety, fatigue, scepticism, and inefficacy associated with the use of technology (Salanova, Llorens and Ventura, 2014). Technostress materializes in the invasion of working moments and interpersonal communication; in what we expect to consider as free time; in the difficulty of having a suitable estimate of the personal investment in work and the time dedicated to it.

The right balance will be found in the compromise between the opportunity for the worker to manage their time and the awareness of knowing when to stop, to prevent the concretization of that dystopian future of self-exploitation described by Abdelnour (2013).

The impact of digitalization is not limited to *personal* working modalities but also affects industries and work processes. As described by Hirsch (2016), here the scenarios are contradictory: digitization

is producing rich opportunities for business, including new forms of entrepreneurship and independent work. It is associated with more complex work processes, but also with smarter products and services and, potentially, more sustainable ones. Additionally, job losses due to digitization should be counterbalanced over a long-term period. On the other hand, the requirements for job skills are more complex, requiring frequent upgrades and producing a growing demand for intellectual skills while reducing routinized work. And this is affecting all levels of employment, including management.

The change in work dynamics is also caused by the evolution of the meaning of work discussed above. According to Misra and Srivastava (2023), a recent trend sees individuals increasingly integrating their passions and hobbies into their career paths. This shift suggests a rising inclination to seek happiness in the workplace, contrasting with the traditional view of work merely as a *responsibility* and a means to earn enough money to live. This feature of the modern work adds to a post-materialistic perspective, where happiness is not unequivocally linked to material wealth, but to the fulfilment of personal goals such as belongingness and self-expression (Desmet and Pohlmeier, 2013).

Addressing another major challenge, that of the global consumption of materials, has never been as prominent as it is now (Krausmann *et al.*, 2009). At the same time, people are concerned that the ecological transition will dismantle the economy, leading to a regression in growth and consequently jeopardizing employment, which is closely interconnected with it.

The same technology revolution that brought us here, allowing and pushing mass production at lower and lower costs and shaping the climate crisis, can now help us to find new ways to create energy and, in general, to produce with fewer harmful impacts. But, in doing so, we first must find the right balance between the idea of prosperity and constant growth and the awareness that this abundance is destroying the planet, and we humans are not excluded.

A further trend is represented by the competitive drive triggered by globalization, which in the era of the Internet has accelerated processes and increased global competitiveness (Bertoloni, 2016), requiring employees to always strive to reach the top and devote

themselves to work (Thilagavathy and Geetha, 2020). All the phenomena described above have affected the work context, in both positive and negative ways, but, overall, are making it extremely uncertain. The repercussions of this uncertainty can be found in the increasing trend of stress among workers; in fact, according to Leka and Jain (2010) one in three workers in Europe is stressed because of work.

4.2 Diversity and work-related health issues

Nowadays, the workforce includes an increased presence of women, the elderly, single people, and childless couples (Gragnano, Simbula and Miglioretti, 2020): this means that the concept of well-being has begun to include other actors with different needs. On the other hand, the present position and satisfaction of women and ageing people are complex, and the condition of equal employment opportunities is, at an international level, a goal that is far from being achieved.

The European Commission (2022) presents data on the gender pay gap (at 13% in 2020) and unpaid work, confirming the situation of women's underrepresentation in the labour market, and the overburden on women for care in family, but also reports positive trends in the growth of education in the EU. Critical points of attention in Europe are, still, life-work balance, gender segregation in the labour market, and cultural stereotypes. The creation of suitable work organizations apt to promote women's employment in fair conditions is still a goal requiring dedicated research, strategies and policies.

At the same time, the conditions of ageing people at work also require further investigation. The ageing of societies requires the prolonging of active work. The impact of work demands and organization can be both positive and negative on the health and well-being of ageing workers, depending on several factors, as reported by Pak *et al.* (2023). Consequently, the relationship between health and age of retirement is complex, reflecting the roles work has in the life of individuals. Abeliansky and Strulik (2023) investigated the impacts of different types of jobs on health. In their research, they distinguish between different clusters: high- and low-education workers, blue-

and white-collar occupations, and high- and low-status employees. The research reports statistical differences among the groups and reveals a non-trivial correlation among job types and impacts on health. According to the authors, low-status workers develop more health deficits, both before and after retirement, in relation to high-status and white-collar workers.

Gender differences are also considered, indicating high advantages associated with retirement for white-collar women. Education appears as a main factor influencing health. Retirement has more positive impacts on low-status workers than on high-status ones. This highlights the importance of well-being strategies being flexible and inclusive, considering the unique needs of everyone involved, rather than following a *one-size-fits-all* approach.

4.3 Work satisfaction: an indicator of well-being at work

Work satisfaction, in terms of adequate remuneration and personal fulfilment, is a complex concept that has been investigated by several authors, revealing its potential as an indicator of the level of well-being in the work context.

Bailey *et al.* (2019) point out a large variety of facets in which this concept is articulated, assuming that meaningful work is at the centre of the development of human resources.

Work requires a personal investment of physical, cognitive, and emotional energy to perform tasks that are characterized by specific variety, significance, and identity. The feeling of adequacy of the reward depends also on the sense of the usefulness and value attributed to the tasks or to the final goal of the performed work.

The meaningfulness associated with work therefore has several dimensions, including the psychological state derived from the job characteristics, personal engagement, and psychological empowerment; the spiritual dimension related to the sense of joy and of connection through work to a greater sense of good; values related to individual fulfilment including autonomy, freedom, social recognition, self-expression, serving others, and acquisition of a public identity.

4.4 Strategies for researching

The importance of researching work-related mental problems asks for the creation of innovative approaches and the literature provides valuable directions.

Rugulies *et al.* (2023), analyze the consequences of mental health problems that are associated with higher absence at work, unemployment, lower income over a lifetime, and impaired quality of life, with consequent impacts on possible exacerbation of mental disorders and physical well-being. The authors point out the limits of earlier research and identify directions for future investigations including: the need for better theoretical frameworks; improved understanding of biophysiological mechanisms; innovative approaches to the collection and analysis of data; and the understanding of the role played by the contexts.

Pega *et al.* (2023) point out two specific goals for research in Italy: *i) Adapt monitoring of working conditions to the changing world of work, focusing on psychosocial risk factors. ii) Harmonise data on working conditions from records and registers for use in the national Information System for Prevention in the Workplace and expand the system's capture of psychosocial risk factors.*

This framework matches the Spoke 2, WP3 *Big data and innovative approaches to improve global health and wellbeing* of MUSA and the goal of developing innovative health solutions to create prevention and promote of healthy lifestyles, recognizing the importance of new approaches for the detection of work-related triggers of stress:-

But how do we define stress? According to Abreu *et al.* (2002) «stress is the psychological and physical state that results when the resources of the individual are not enough to deal with the demands and pressures of the situation».

Analyzing this definition, two concepts emerge: first, stress is a psychophysiological state. According to Aigrain *et al.* (2016), stress elicits physiological, affective, and behavioural responses. This means that, in order to assess the health of individuals in a specific context, it is fundamental to integrate to qualitative measures (e.g. self-reports and questionnaires) as the gold standard (Scherz *et al.*, 2020) in the monitoring of physiological data. In this regard,

commonly used wearable devices (e.g. FitBit, Empatica, etc.) (Scherz *et al.*, 2020; Pakhomov *et al.*, 2020), represent a non-invasive tool to detect stress biomarkers (Giorgi *et al.*, 2021) and can be employed as a valid resource during well-being assessment research.

The second concept contained in Abreau *et al.*'s definition (2002), is well explained by the demands-resources (JD-R) model (Demerouti *et al.*, 2001), which asserts that if the resources of the individual are not enough to deal with the demand of the work (e.g., long working hours), this imbalance generates stress. Considering that, we still have to make a distinction, since demand is not intrinsically negative (Bordi *et al.*, 2018). This concept is described in the framework of stress by Lu, Wei and Li (2021), which distinguishes between *sustress* (inadequate stress), *eustress* (good stress), and *distress* (bad stress). According to this model, if a demand is perceived as a mild challenge, where resources are sufficient to deal with it, the response of the body is positive, generating *eustress*.

On the other hand, if demand is perceived as a hindrance, where resources are not adequate (e.g. I have to do this job in a short time, but now it is time to go home) the individual will be *distressed*. Hence, stress is not always negative, and we need a certain amount of it to stay motivated and productive. Unfortunately, *distress* situations occur more frequently, with a negative impact on both the employees and the companies. In fact, work-related stress reduces work performance and increases absenteeism (Lockwood, 2003), resulting in an economic loss of 2.5% of GDP in Europe (EUROSTAT, 2017).

Stress does not only affect the mood of the person but also brings physical negative outcomes, such as musculoskeletal disorders, cardiovascular health, diabetes, and so on (Weale *et al.*, 2023). For this reason, it is fundamental to assess the level of stress and well-being of a work context, not just to make work a place where health is assured, but also a place where health is promoted.

4.5 Conclusions

The rethinking of the organization of work should accomplish the goal of increasing individual satisfaction, decreasing stress at work, delay-

ing retirement, and promoting healthy lifestyles. These goals should be harmonized with the requirements of efficiency and positive performance, with the awareness that work conditions significantly affect motivation and commitment.

Literature reviews confirm the need for new research to provide scientific results about potential strategies for rethinking work to create inclusive, healthy, and desirable work conditions.

Some relevant issues emerge when addressing the question of well-being at work, which are derived from the meaning of work itself: first, and at a lower level, work represents a place where social justice is realized since it is how people earn money to live. But work cannot be simply a place that allows us to *survive*, since people are experiencing their desire to live and feel fulfilled in what they do. In this way, work is becoming a place where people can feel realized and build personal development.

At the same time, huge changes are reshaping the structure and meaning of work. People are nowadays faced with a technology revolution, globalization, and the climate crisis. In this situation, people are called to rethink the way they work, produce, and consequentially, have an impact.

Work environments are the contexts where people spend a very significant part of their lives, and the work conditions impact their personal identity and lifestyles, physical and mental well-being, and long-term health. Investing in research to prevent work-related diseases is a matter of social justice and convenience, and workplaces should be considered ideal contexts to investigate health, not only to reduce risks of work-related pathologies but also to promote awareness and healthy behaviours. Concerning the specific tasks of the MUSA project that are the reference for this document, the roles of the designers-authors of this document are multiple, and include: the preliminary literature review aimed at framing the complex issues of defining and measuring well-being and stress; devising suitable approaches for the collection of functional data through the use of wearable devices and tools for gathering information on the subjective experience of users; conducting tests and assessments to evaluate the acceptability and meaningfulness of the devised approach. Finally, the authors consider it essential to ensure that the whole research

process can be conducted according to the principles of full respect for the rights of the workers involved in the process.

The desirable scenario we want to propose in this article is inspired by *The Imperative of Responsibility*, by Jonas (1984), which states: «act so that the effects of your action are compatible with the permanence of genuine human life». According with Jonas, people should include human value in the ultimate goal of production, and not only the related monetary growth. This means considering physical, psychological and social parameters to assess our level of well-being as humans, leaving behind the illusion of an economic growth without any disastrous repercussions on our lives. Our research on well-being and health at work is a contribution to this perspective.

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The volume presents a series of studies and reflections on how design is approaching the transition towards more uncertain futures. Starting from a shared understanding that we are facing radical transformations of our physical and social world, all the authors embrace a systemic perspective to position the role of design in addressing these challenges.

The chapters present novel ways of integrating new disciplines such as data analysis, artificial intelligence, neurosciences into practice and theory and explore the extension of design processes to develop new frameworks for tackling major societal and environmental changes.

One of the main conclusions of the book is that the complexity of the challenges, and the systemic approaches needed to address them, mean that the efforts can only be collective and multidisciplinary. No single project or single design group can take on board the range of transformations, collectively, however, each project can contribute to creating elements which become components of innovation that in turn can be mobilised by other systems.