

Side Effects of Digital Transformation on the Working Environment: Emerging Challenges and Implications

Andreea TUDOSE

*National University of Science and Technology POLITEHNICA, Bucharest, Romania
andreea.tudose04@gmail.com*

Abstract. *Digital transformation has redefined the modern workplace by integrating technologies like artificial intelligence (AI), machine learning, cloud computing, and automation into business operations. While these technologies have brought numerous benefits, including increased efficiency, flexibility, and productivity, they have also introduced unintended side effects that can negatively impact the working environment. This article explores the key challenges emerging from digital transformation, including job displacement, increased stress and burnout, digital surveillance, work-life balance issues, and a widening skills gap. The discussion is supported by recent studies, emphasizing the importance of strategic measures to address these challenges and create a more sustainable and inclusive workplace.*

Keywords: Digital Transformation, Workplace Environment, Organizational Culture, Employee Well-being, Work-Life Balance.

Introduction

Digital transformation integrates digital tools into various business processes, which has led to important changes in the way organizations operate, especially in terms of leveraging digital technologies to streamline operations, improve services and customer experiences. New tools - such as artificial intelligence, cloud computing, robotics, the Internet of Things (IoT) - have fundamentally reshaped the work environment and organizational structures.

Although digital transformation entails numerous benefits, there are also a number of negative consequences within organizations, representing challenges for both employees and the organization itself. Among these side effects are job loss due to automation - employees finding themselves in a situation of having to follow professional retraining and/or improvement courses; challenges regarding work-life balance - especially in the context of the adoption of remote and hybrid working models; issues regarding the growth of digital surveillance technologies in the workplace - which involve growing concerns regarding ethics, privacy and autonomy.

Given all this, adopting a strategic human-centered approach at the organizational level becomes essential to mitigate the negative effects of digitalization. In this regard, concrete actions that should be considered refer to reskilling initiatives, digital literacy programs, support for maintaining employee well-being and policies that promote an ethical, sustainable and inclusive work environment in a digital context. This article focuses on the adverse effects of digital transformation on employees and, implicitly, on organizations, by addressing the relevant literature and proposing strategies to mitigate them.

Literature review

The loss of jobs as a result of the adoption of digital transformation – especially through automation and artificial intelligence – is one of its most significant secondary effects. Although efficiency has in most cases been increased by transferring repetitive tasks, automation has also led to the elimination of some jobs, especially in the manufacturing industry, logistics and the service sector

(Patil, 2024). The new digital context has created some new employment opportunities, but these often require advanced digital skills. In the context where, in most cases, the laid-off employees do not possess these skills, the situation of a skills deficit is reached on the labor market.

The most obvious effects regarding the impact of digitization on the workforce were observed in regions with limited access to digital education and professional conversion programs. Although digital transformation has also created some new employment opportunities, there is a significant gap between the skills needed by employees to fill these new positions and the competencies they actually possess, according to the study by Eurofound (2021). This mismatch has led to situations such as increased unemployment and fear of job loss, particularly among low-skilled workers.

Digital tools have changed the way employees do their jobs, but they have also led to higher workloads and higher levels of stress. Especially in the context of remote work, there is the expectation that employees are constantly connected, a fact that has increasingly blurred the boundaries between professional and personal life and has led to the presumption of employees to be always available (Farivar et al., 2023). Moreover, the digital transformation can generate the so-called "technostress" phenomenon - the stress associated with the constant use of digital technologies, frequent updates and the need to quickly adapt to new systems (Chiappetta, 2017).

Studies by Thompson et al. (2023) have shown that employees working in digital-first environments experience higher rates of burnout than their counterparts in traditional work environments. This problem is also accentuated by the constant need for employees to adapt to digital systems and the constant pressure to effectively meet their objectives.

The spread of remote working, due to digital transformation, comes with the advantage of flexibility, but at the same time, it makes it more difficult for employees to maintain a work-life balance. Recent research has shown that digitalization, especially through the implementation of collaboration platforms and the use of mobile devices, has contributed to creating an expectation of constant connectivity and, as a result, making it difficult for employees to disconnect even after working hours (Limarev et al., 2018). Furthermore, a survey conducted by the International Labor Organization (ILO, 2020) found that remote workers were more likely to work longer hours, which leads to a higher risk of stress and burnout, compared to office-based employees.

The demand for employees with strong digital skills is increasing, in the context of accelerating digital transformation. In this situation, many employees - especially those working in traditional industries - may not be sufficiently digitally literate to work within these new systems, tools and platforms (Kadhim, 2024). The potential for digital transformation is therefore limited by this digital skills gap, as companies find it quite difficult to hire candidates who are sufficiently qualified to fill technical roles (Gilch, & Sieweke, 2020).

It has been found that the digital skills deficit is more pronounced in sectors such as IT, cybersecurity, data analytics and digital marketing. Therefore, efforts are being made to improve this problem by implementing training programs, digital education actions, partnerships between business and educational institutions. For example, there are organizations that offer internal training programs to improve the skills of their employees, while others collaborate with universities to develop curricula that align with industry needs (OECD, 2016).

Digital transformation has given employers new tools to monitor employee performance more closely than ever before. While companies may claim that these are useful in optimizing performance, digital monitoring systems raise concerns about ethics, privacy, and autonomy. Employees report increased distrust and decreased morale as a result of the introduction of digital

surveillance tools, such as software that tracks keystrokes and internet searches or the use of artificial intelligence to analyze their behavior (Ball, 2021).

The European Agency for Safety and Health at Work (2022) conducted a survey in which several employees expressed dissatisfaction with constant monitoring in the workplace. Moreover, they expressed their fear that such policies reduce their autonomy and create a sense of anxiety, increasing the risk of micromanagement and a toxic organizational culture.

Addressing the unintended negative effects of digital transformation requires a complex approach:

Investment in reskilling and upskilling programs: The World Economic Forum (2020) explains that training actions regarding professional improvement and retraining are essential to ensure a smooth transition of employees to the new requirements as a result of the digital transformation. In addition to the support provided to their employees in the adaptation process, companies that invest in such training programs benefit from increased productivity and a high level of employee retention.

Policies on work-life balance: Stress reduction and improved job satisfaction can be achieved by implementing work-life balance policies, such as the “right to disconnect”. Organizations that adopt a culture based on balance tend to record higher productivity and lower staff turnover rates (Messenger, 2019).

Flexible work arrangements: According to Messenger's (2019) research, the harmony between career and personal life can be positively influenced by flexible work arrangements - such as remote work, flexible hours, short work weeks - which increase employee satisfaction.

Adoption of digital literacy programs: Day et al. (2020) analyzed how digital literacy impacts employee transition in the context of accelerating digital transformation, concluding that organizations that adopt digital literacy programs have employees who adapt more easily, register a low resistance to new technologies and develop a more innovative organizational culture.

Ethical and transparent surveillance practices: Ethical and transparent monitoring practices are vital to maintaining employee trust, and organizations that value confidentiality and open communication tend to experience higher employee morale and engagement (Ball, 2021).

Methodology

This paper addresses the side effects of digital transformation in organizations, taking a holistic approach, both quantitative and qualitative. By using qualitative methods, such as data comparison, analysis and synthesis, the overall objective of the paper is to conduct an analysis of the impact of digital transformation on the work environment and to identify the main relevant strategies for improving these issues. The qualitative and quantitative data are largely based on secondary research - including reviews of relevant literature, studies and statistical data from reliable academic sources - and primary research – based on observation (participatory or not) of the phenomenon, its causes and the main challenges related to maintaining work-life balance. The practical examples are selected taking into account the author's main areas of interest, but based on objective data.

Results and discussions

Job-related hyperconnectivity

According to surveys conducted by Gallup (2024) regarding daily stress at work, it was found that 37% of respondents have experienced this feeling often in the recent period. Considering the gender

criterion, women tend to experience occupational stress to a greater extent (39%) compared to their male colleagues (35%), and related to age, it seems that almost half of young people under 35 (41%) have felt significantly stressed recently, compared to more mature employees over 35 (36%). On the other hand, managers declare themselves more stressed (38%) compared to employees without management positions (36%).

Based on their work location, employees who work exclusively from home (39%) report being more stressed than those who work in a hybrid system (38%) and those who work only from the office (36%). Therefore, the hypothesis that digital transformation can create the premises for increasing stress among employees – through hyperconnectivity and the diminishing boundary between professional and private life – compared to traditional work environments is confirmed.

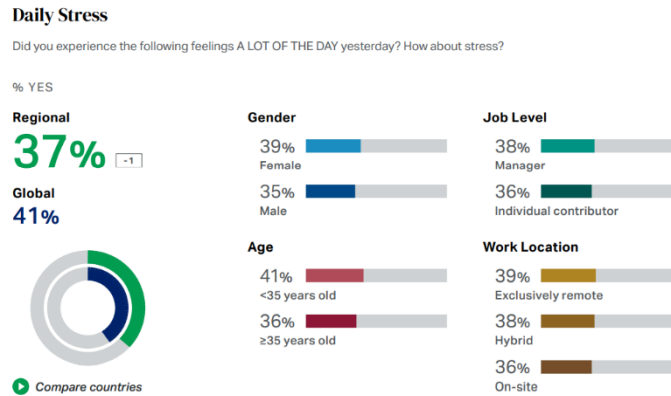


Figure 1. Daily Stress Representation

Source: <https://www.gallup.com/workplace/349484/state-of-the-global-workplace.aspx>.

The example of Microsoft's Japanese division proves that employees are more productive when they become more relaxed and have a sustained work-life balance. Microsoft's "Work Life Choice Challenge" initiative, implemented in 2019, exceeded expectations in terms of efficiency. This experiment lasted for a month and assumed that employees worked only four days a week, from Monday to Thursday. By adding a day off, it was found that overall productivity increased considerably (by approximately 40%). The project assumed several positive aspects, including the reduction of energy consumption and the impact on the environment, as well as the satisfaction among the employees, who declared themselves in a proportion of 92% delighted with this initiative (Paul, 2019).

Isolation and reduction of human interaction as a result of digitalization

According to a Gallup survey (2024) on the feeling of loneliness experienced by employees, it was observed that 20% of respondents stated that they had felt lonely in the last few days to a great extent. In particular, young people under 35 seem to experience this feeling more (22%) than their colleagues over 35 (19%). This difference in terms of age can be explained by the greater need of young people to socialize, especially considering that they spend a lot of time at work, neglecting the balance between work and personal life. Research by Berkman and Glass (2000) focuses on the relationship between social ties and community, respectively social support and health, demonstrating that social isolation and loneliness in the long term have very serious effects on physical and mental health. Also, people with limited social ties have a double mortality risk compared to socially active people. At the same time, about a quarter of employees who work exclusively from home admit to often experiencing feelings of loneliness, compared to 22% of

hybrid employees and 16% of office workers who face such problems. Although having a job generally reduces loneliness – employed people are less likely to feel lonely (20%) than unemployed people (32%), regardless of their age (Pendell, 2024) – the digitalization of the workplace, especially through the adoption of remote work, has a negative impact in this regard.



Figure 2. Daily Loneliness Among Employees

Source: <https://www.gallup.com/workplace/645566/employees-worldwide-feel-lonely.aspx>.

The multinational corporation IBM represents a good practice in the field, through the successful implementation of an innovative policy, through which it offers employees the opportunity to participate in a volunteer program, with the aim of balancing professional life with personal life. This initiative came in the context in which it is considered that employees who get involved in society are most likely to be more involved at work. This policy has been very successful, with impressive numbers - 974,000 volunteer hours spent by IBMers since 2022 (IBM, 2024, p. 7).

Based on these data and examples, it is realistic to state that:
Workplace hyperconnectivity leads to stress and burnout among employees.
Digital transformation involves isolation and reduced human interaction, causing stress among employees.

Conclusion

Although the digital transformation has changed the paradigm of the workplace, bringing numerous benefits, such as increasing productivity, flexibility and efficiency, it has also reshaped processes through a series of unintentional side effects with negative impact. Among the key issues in this regard are the increase in stress among employees, the decline of jobs, challenges related to work-life balance, digital surveillance and the digital skills gap. On the other hand, organizations have the tools to reduce these negative effects by creating a more sustainable, inclusive and supportive organizational culture, in order to effectively adopt digital transformation, without compromising employee well-being.

This work focused on identifying and analyzing two significant effects of digitalization - the causal relationships between digital hyperconnectivity and isolation, limited human interaction, and, respectively, between stress and burnout among employees. This data has also been supplemented with a set of best practices.

Among the limitations of this research is the more focused perspective on the adverse effects of digital transformation on the workplace, without placing a significant emphasis on its positive aspects. In this sense, the study encourages interest in other researches, especially considering the accelerated dynamics of the phenomenon, any expansion or deepening of the two directions or related topics becoming a research premise worth following.

References

- Ball, K. (2021). Electronic monitoring and surveillance in the workplace: literature review and policy recommendations, Publications Office. <https://data.europa.eu/doi/10.2760/5137>.
- Berkman, L. F., & Glass, T. (2000). Social Integration, Social Networks, Social Support, and Health. In *Social Epidemiology* (pp. 137–173). Oxford University PressNew York. <https://doi.org/10.1093/oso/9780195083316.003.0007>.
- Chiappetta, M. (2017). The Technostress: definition, symptoms and risk prevention. *Senses and Sciences*, 4(1), 358–361. Retrieved from https://www.researchgate.net/publication/325031719_The_Technostress_definition_symptoms_and_risk_prevention.
- Day, A., Paquet, S., Scott, N., & Hambley, L. (2012). Perceived information and communication technology (ICT) demands on employee outcomes: The moderating effect of organizational ICT support. *Journal of Occupational Health Psychology*, 17(4), 473–491. <https://doi.org/10.1037/a0029837>.
- Eurofound. (2021). Digitisation in the workplace. Publications Office of the European Union. Retrieved from <https://www.eurofound.europa.eu/en/publications/2021/digitisation-workplace>.
- European Agency for Safety and Health at Work. (2022). Digital transformation and worker well-being: Balancing benefits and risks. Retrieved from <https://osha.europa.eu>.
- Farivar, F., Eshraghian, F., Hafeziah, N., & Cheng, D. (2023). Constant connectivity and boundary management behaviors: the role of human agency. *The International Journal of Human Resource Management*, 35(7), 1250–1282. <https://doi.org/10.1080/09585192.2023.2271835>.
- Gallup. (2024). State of the Global Workplace: 2024 Report. Gallup Inc. <https://www.gallup.com/workplace/349484/state-of-the-global-workplace.aspx>.
- Gilch, P. M., & Sieweke, J. (2020). Recruiting digital talent: The strategic role of recruitment in organisations' digital transformation. *German Journal of Human Resource Management*, 35(1), 53-82. <https://doi.org/10.1177/2397002220952734>.
- IBM. (2024). 2023 ESG REPORT IBM Impact. Retrieved from <https://www.ibm.com/downloads/documents/us-en/10a99803d62fd3a5>.
- International Labour Organization. (2020). Teleworking during the COVID-19 pandemic and beyond: A practical guide. International Labour Office. Retrieved from https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_protect/@protrav/@travail/documents/instructionalmaterial/wcms_751232.pdf.
- Kadhim, M. J. (2024). Digital Literacy and Its Importance in the Modern Workforce. *International Journal of Social Trends*, 2(2), 44–50. Retrieved from https://www.researchgate.net/publication/382641453_Digital_Literacy_and_Its_Importance_in_the_Modern_Workforce.
- Limarev, P. V., Limareva, Y. A., Akulova, I. S., Khakova, G. S., Rubanova, N. A., & Nemtsev, V. N. (2018). The role of information in the system of macroeconomic indicators. *Espacios*, 39(50). Retrieved from <https://www.revistaespacios.com/a18v39n50/a18v39n50p16.pdf>.
- Messenger, J. C. (2019). Telework in the 21st century: An evolutionary perspective. *International Labour Review*, 158(2), 175-193. <https://doi.org/10.4337/9781789903751.00005>.
- OECD. (2016). Skills for a Digital World. 2016 MINISTERIAL MEETING ON THE DIGITAL ECONOMY BACKGROUND REPORT. *OECD DIGITAL ECONOMY PAPERS*, No. 250. Retrieved from https://www.oecd.org/content/dam/oecd/en/publications/reports/2016/06/skills-for-a-digital-world_g17a27ea/5j1wz83z3wnw-en.pdf.

- Patil, D. (2024). Impact of artificial intelligence on employment and workforce development: Risks, opportunities, and socioeconomic implications. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5057396.
- Paul, K. (2019). Microsoft Japan tested a four-day work week and productivity jumped by 40%. *The Guardian*, 2019–2021. Retrieved from <https://www.theguardian.com/technology/2019/nov/04/microsoft-japan-four-day-work-week-productivity>.
- Pendell Ryan. (2024). 1 in 5 Employees Worldwide Feel Lonely. *Gallup*. Retrieved from <https://www.gallup.com/workplace/645566/employees-worldwide-feel-lonely.aspx>.
- Thompson, K., Roberts, E., & Harrison, P. (2023). Burnout in the digital workplace: Causes, effects, and mitigation. *Journal of Applied Psychology*, 108(4), 289-301.
- World Economic Forum. (2020). The Future of Jobs Report. *Geneva: World Economic Forum*. Retrieved from <https://www.weforum.org/publications/the-future-of-jobs-report-2020/>.