

NAVIGATING THE DISRUPTIVE CHALLENGES AND OPPORTUNITIES OF DIGITAL TRANSFORMATION IN THE LABOUR MARKET: UPSKILLING AND RESKILLING FOR THE FOURTH INDUSTRIAL REVOLUTION

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Abstract: Digital transformation and the Fourth Industrial Revolution (4IR) present opportunities for businesses, but also generate disruptive challenges for organizational performance and the labor market, requiring new skills and competencies. Upskilling and reskilling are crucial in a volatile environment that demands a digital mindset. The paper aims to delineate the key challenges and opportunities presented by emerging and disruptive technologies (EDT) concerning the labor market and to identify the top skills required for thriving in the 4IR business environment. Some guidelines are also offered for organizations and managers regarding the necessity to embrace a holistic approach and promote digital IQ, digital dexterity, and employee career development. To prevent a digital divide in a disruptive technological landscape, a comprehensive and responsible skilling strategy is required. Attainment of high-performance levels and competitive advantage through digital transformation mandates leadership competencies in addition to digital capabilities. Furthermore, success in this regard requires cooperation between businesses, industry, educational institutions, and governments, to promote investment in infrastructure and lifelong learning. In order to effectively leverage the potential of EDTs and alleviate the skills mismatch within the context of the 4IR, the education system must undergo a transformation that fosters agility, resilience, and proactive responsiveness to these trends.

Keywords: digital transformation, fourth industrial revolution (4IR), emerging and disruptive technologies (EDT), performance, upskilling and reskilling.

1. Introduction

The Fourth Industrial Revolution (4IR), which is succeeding the digital one, has emerged, and it is exerting a profound influence on a global scale. The 4IR, a concept initially introduced by Klaus Schwab [1] in his 2016 publication entitled “The Fourth Industrial Revolution”, is profoundly impacting various facets of society, business, and the environment at a global level.

Nowadays, the world is witnessing the widespread adoption of digital transformation that yields both immediate and direct consequences, as well as more diffuse and far-reaching impacts. A plethora of intelligent systems and technologies is currently available, categorized into three main domains – physical, digital, and biological.

Some notable 4IR technologies include: the Internet of Things (IoT) with subcategories such as Industrial Internet of Things (IIoT) and Internet of People (IoP); Artificial Intelligence (AI) and Machine Learning (ML); big data and analytics, robots and autonomous vehicles; cloud computing (digital platforms); block chain; eXtended Reality (XR) – that comprise Virtual Reality (VR), Augmented Reality (AR), and MixedReality (MR); 3D printing and additive manufacturing, as well as quantum computing, among others. These technologies are contributing to the transformation of our world in the context of the 4IR [2].

The EDTs have significant implications on performance not just in terms of different organizational levels, ranging from strategic to tactical and operational, but also for individuals, markets, industries, and society as a whole.

The 4IR exhibits similarities with its predecessors in that it involves the replacement of outdated technologies (legacy technologies) with emerging ones. It also imposes new demands and requirements on various fronts, such as the need for reorganization and rethinking business processes and performance management approaches, the creation of new job roles, and the development of new skills and competencies.

Successful management of the changes generated by EDTs is contingent upon a range of factors, including the configuration of workplaces and the reevaluation of workforce skills necessary to leverage such technologies. To remain competitive in a rapidly evolving landscape, companies seeking to exploit opportunities afforded by EDTs should develop a digital transformation strategy that adopts a holistic approach, incorporating innovation-driven business strategies [3].

The main objective of this paper is to delineate the key challenges and opportunities arising from digital transformation and 4IR with respect to both the labor market and organizational performance, as well as to identify the top

skills required to thrive in a 4IR business environment. Additionally, the paper offers guidelines for organizations and their managers on how to foster employee career development and performance, while also underscoring the vital role played by educational institutions in bridging the skills gap.

This paper is informed in part by a review of relevant literature, including reports from prestigious professional organizations such as the World Economic Forum, as well as the authors' professional experience across various domains, such as information technology, education, consulting, and management.

2. Essential Skills and Trends for the Future Workforce

The digital transformation of organizations has become a crucial requirement for achieving profitability, gaining a competitive edge, and ensuring long-term growth. It is important to note that this disruptive shift towards digitization and digitalization involves more than just the adoption of new technologies, infrastructure, and workflow automation; it also encompasses aspects related to information, knowledge, insights, and people, including leaders, employees, and customers. Nevertheless, various challenges, such as budgetary limitations, employee skill and experience gaps, resistance to change, as well as inadequate leadership and organizational culture, may hinder or slow down the implementation process. As previously highlighted, digital transformation and 4IR present vast opportunities, including the creation of novel industries/sectors, products/services, business models, types of companies, and jobs/occupations.

It is imperative to manage these processes proficiently, given that alongside the opportunities, they generate significant disruptive challenges, including changes in the labor market and an intense need for new skills and competencies, as illustrated in Figure 1.

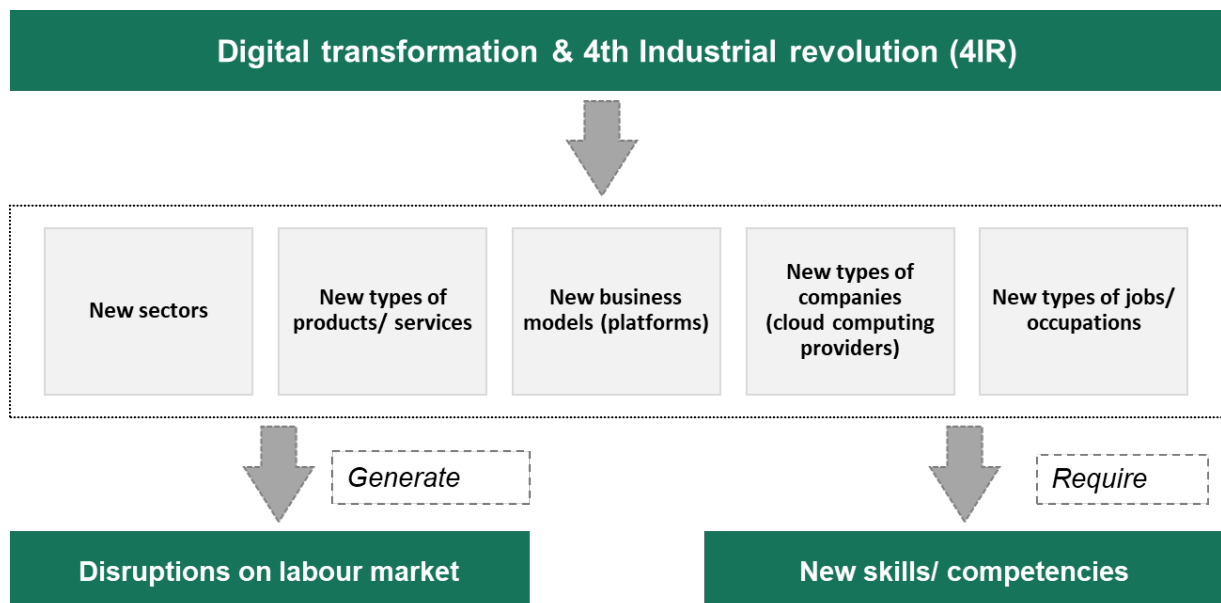


Figure 1: Important Effects of Digital Transformation and the 4IR
Source: Authors own computation

In the current era of unpredictability and instability, possessing digital competencies is vital for organizations to gain a competitive edge [4].

In an era marked by technological challenges as well as advancements, the essential competencies required for a high-performing workforce, as well as the corresponding employment opportunities are undergoing rapid and disruptive transformations. In its third report titled “The Future of Jobs”, released in October 2020, the World Economic Forum (WEF) presented and analyzed the most significant trends in the labor market based on data representing 7.7 million workers worldwide.

As can be observed (Figure 2), “*analytical thinking and innovation*” is in first place, as the most critical skill since 2018. “*Active learning and learning strategies*” has moved to second place as of 2020, and is expected to maintain this ranking in

2025, a significant jump from its previous placement (4th in 2018). In addition to the aforementioned skills, the top five skills predicted for 2025 include “*complex problem-solving*”, “*critical thinking and analyzing*”, as well as “*creativity, originality and initiative*”. Interestingly, “*technology design and programming*”, previously ranked 4th in 2020, has dropped to 8th in 2025. This shift may be attributed to an increased adoption of AI and ML technologies. Additionally, the WEF predicts that with the expected assistance of computers and robots, new skills related to “*technology use, monitoring and control*” will be required by 2025, which were not previously identified in 2018 or 2020. Considering the disruptive changes and volatile, uncertain, complex, and ambiguous (VUCA) environment, skills such as “*resilience, stress tolerance and flexibility*” also newly emerged as part of the Top 10.

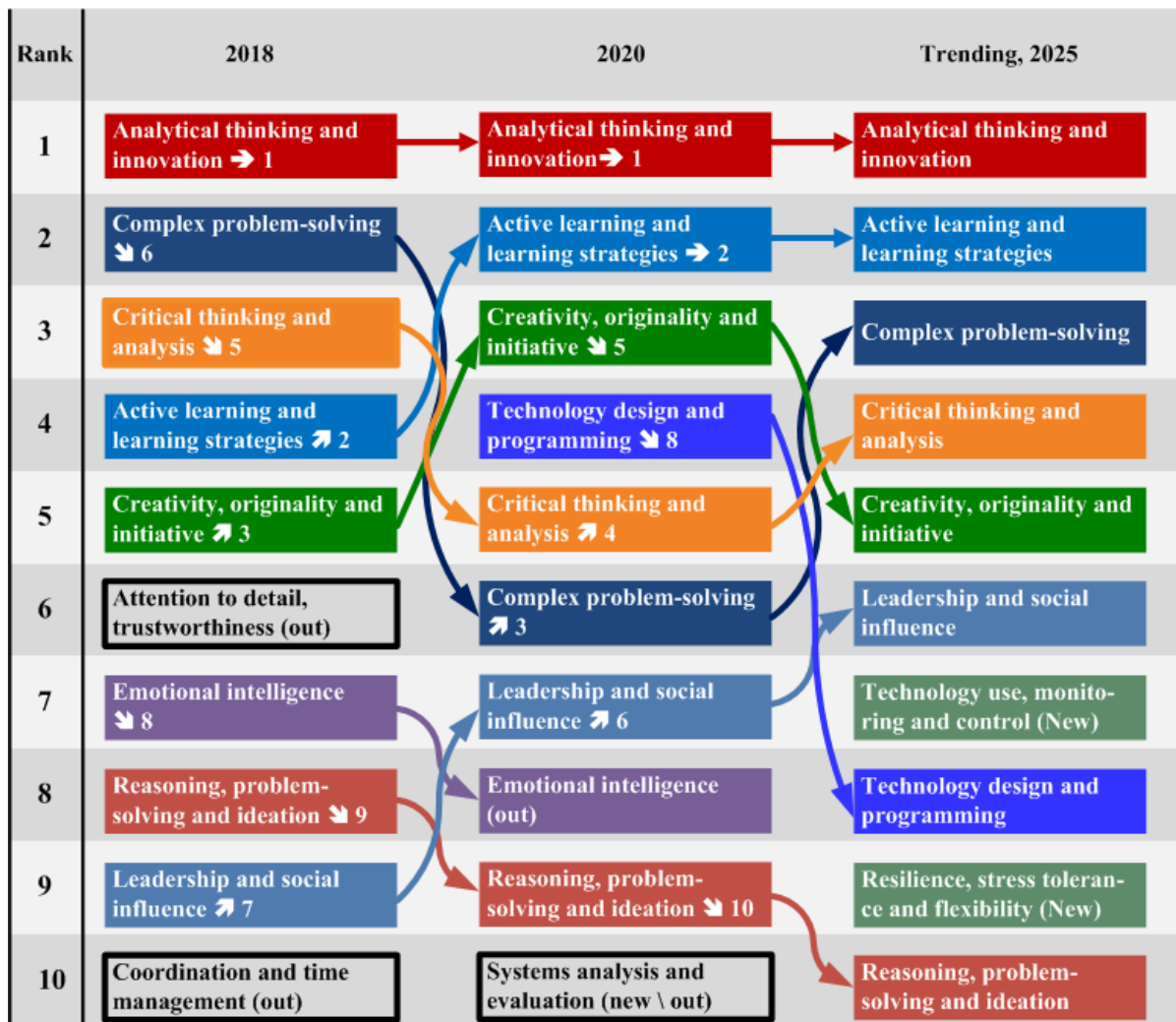


Figure 2: Top skills for job opportunities

Source: Authors own computation based on WEF Report [5]

In the midst of the challenges brought forth by EDTs, the urgency of responsible skilling, re-skilling, and upskilling cannot be overlooked. Rather than a one-time target, it is a continuous process that can be accomplished through different forms of education.

In order to remain competitive and prevent unemployment, learning should be prioritized by every organization and individual to acquire the necessary skills for present and future jobs, roles, and careers.

In the context of challenges posed by novel technologies, while organizational digital IQ is undoubtedly important, as Figure 2 highlights, other skills are equally vital.

A systemic, synergistic, and holistic approach that encompasses “digital dexterity” is imperative, meaning that leaders and workers must not only possess digital skills but also a digital mindset. Achieving such a significant and transformative goal requires specific digital objectives and priorities (Figure 3).

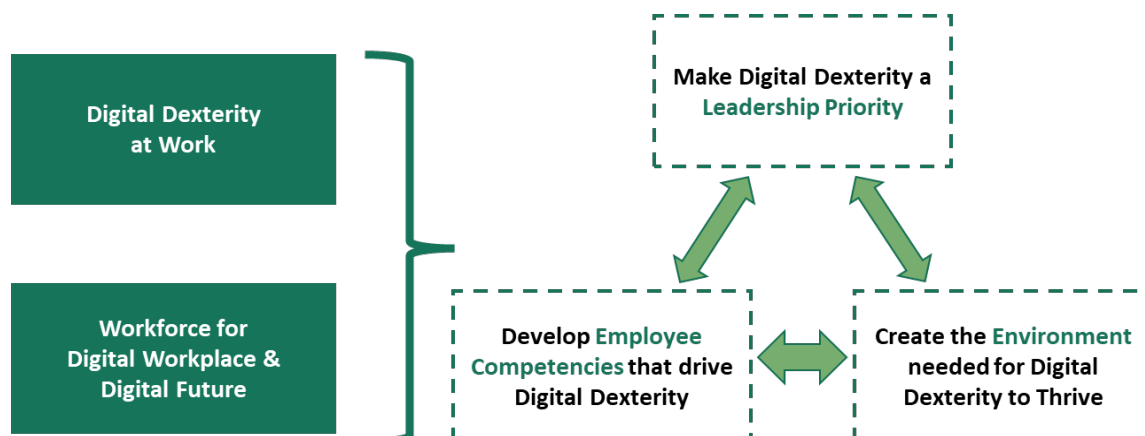


Figure 3: Digital dexterity – priorities

Source: Processing and summarization of the authors based on Gartner [6]

Certainly, transformations generated by digitalization and Industry 4.0 bring about changes that require consideration of factors such as performance management, human resources strategy, human resource management policies and practices, organizational culture, leadership, and other organizational “ingredients”. The current digital era emphasizes the importance of a

synergy between digital and leadership capabilities, particularly for digital masters, as illustrated in Figure 4.

By leveraging AI, ML, and visualization, “digital masters” are able to transform the abundance of data available into valuable insights that facilitate an informed decision-making process.

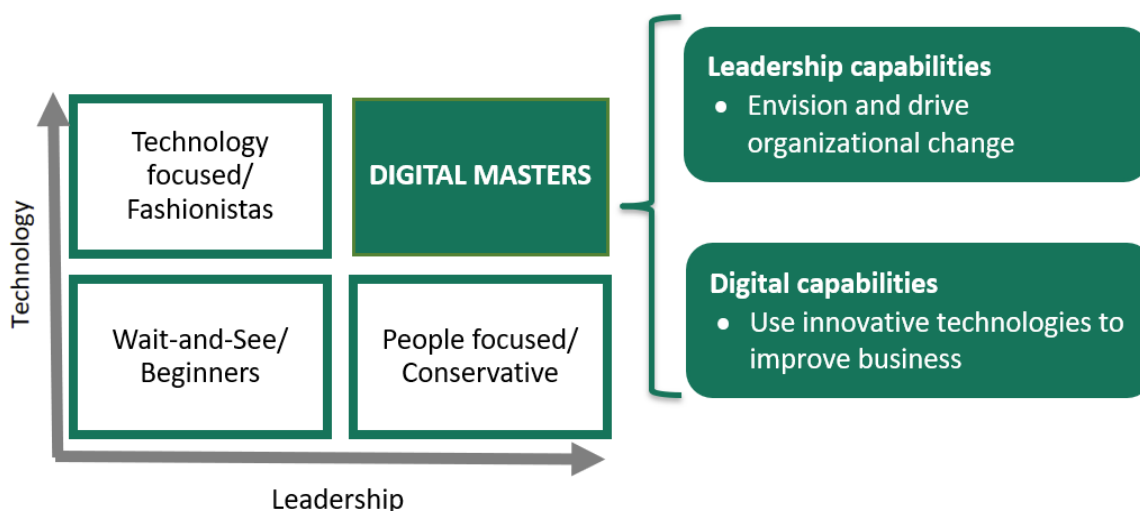


Figure 4: Digital masters

Source: Authors own processing after Bonnet & Westerman [7]

In the process of digital transformation, investments in infrastructure are essential; however, it is vital for strategic leaders to acknowledge that success overwhelmingly relies on employees, given the constantly changing talent requirements and hyper

competition for talents and critical skills. Hence, identifying, acquiring, attracting, motivating, engaging, and retaining talents are crucial to be able to build a diverse, agile, and adaptable workforce.

3. Conclusions and Recommendations

It is obvious that the widespread adoption of 4IR-specific technologies and scaling of innovations globally will lead to disruptions in the labor market. Nowadays, and moreover in the future, skills gaps may result in a compounded and adverse set of consequences. Unfortunately, a significant percentage of individuals are not equipped with the requisite and appropriate skills to effectively accomplish their professional goals and achieve performance. In the face of technological advancements, the absence of digital proficiencies poses a significant threat to their future career prospects.

In the context of the emergence of the digital society and Industry 4.0, which demand new skill sets, it is imperative for individuals to engage in lifelong learning, while organizations should prioritize not only upskilling and reskilling to enhance employee qualifications and specializations, but also the attraction and retention of digital talent.

Digital transformation at the organizational level is a complex process that requires the involvement of all individuals, ranging from top-level management to each individual employee. It could be argued that digitalization is not a fortuitous event, but rather a deliberate and purposeful endeavor and as such it must be integrated into an organization's vision, mission, and values, and effectively communicated to employees and other stakeholders. Furthermore, a comprehensive digital transformation strategy, encompassing all aspects of digitalization and EDTs, must be included in the organization's overall strategy. The formulation of SMART objectives must encompass the digitalization of both the internal processes and the extended network of customers and other relevant stakeholder categories.

There are major differences between the digital skills of the younger generation – digital natives – and the older generation.

In addition, effective communication of these objectives to employees is necessary for their engagement in the digital transformation process, allowing them to understand the occurring changes and their potential impact. Both theory and practical experience demonstrate that a considerable number of individuals are still unfamiliar with digital technology.

Digital skill disparities have been noticed between the younger, technologically savvy “digital natives” and the older generation. An inability to master disruptive technologies can cause significant stress, frustration, and fear, particularly in relation to potential job loss. Even the most experienced individuals may struggle with abandoning traditional work approaches and embracing new ones.

To prevent a “digital divide”, enhance motivation and engagement, and minimize unwanted effects such as decreased productivity, fear, resistance to change, or even sabotage, a proactive approach is necessary to develop and implement a comprehensive skilling strategy. This strategy should encompass several aspects, such as: (1) identifying and attracting digital talent; (2) motivating, engaging and retaining digital talents; (3) training programs for re-skilling and upskilling of employees.

In addition to the individual and organizational responsibility for lifelong learning, it is imperative to have a collaborative effort and a strong partnership among businesses, industry, higher education institutions (HEIs), and governments. Such collective actions can safeguard both the young and inexperienced generation entering the labor market and the unemployed or low-skilled individuals in vulnerable positions due to the lack of relevant skills. A proactive approach is crucial in devising and implementing policies that support the reskilling and upskilling process. Unfortunately, the

current educational system lags significantly behind labor market requirements for new skills, and the curricula is not tailored to these new realities. Therefore, the educational system should be more adaptable, flexible, and responsive to the disruptive changes occurring across all sectors. The development of new curricula is necessary to bridge the skills gap and nurture the type of workforce demanded by the 4IR. Educational transformation and ubiquitous learning are essential steps to harness the potential of emerging technologies specific to the 4IR.

Governments can facilitate the promotion of adaptability and digital resilience to technological change, alongside educational

institutions, by implementing policies that encourage investments in infrastructure and the continuous upskilling and reskilling of the workforce.

For organizations to be able to create a successful digital future, thus fulfill the digital transformation objectives, there is a clear need for new business models, as well as a revised approach towards performance management systems. This must include new types of key performance indicators dedicated to capturing and tracking progress towards digitalization and its related impact. Moreover, an alignment of digital transformation objectives, key performance indicators and employee rewards and incentive schemes is adamant.

References List

- [1] Schwab K. *The Fourth Industrial Revolution*, World Economic Forum; 2016, p. 12.
- [2] Skilton M. & Hovsepian F. *The 4th Industrial Revolution: Responding to the Impact of Artificial Intelligence on Business*, Palgrave Macmillan; 2018, pp. 29-60.
- [3] Pan X., Oh K.-S. & Wang M. *Strategic Orientation, Digital Capabilities, and New Product Development in Emerging Market Firms: The Moderating Role of Corporate Social Responsibility*. Sustainability. 2021; 13 (22): 12703. <https://doi.org/10.3390/su132212703>.
- [4] Liang S. & Li T. *Can Digital Transformation Promote Innovation Performance in Manufacturing Enterprises? The Mediating Role of R&D Capability*. Sustainability. 2022; 14(17):10939. <https://doi.org/10.3390/su141710939>.
- [5] World Economic Forum (WEF). *The Future of Jobs, Third Edition Report*, October 2020. Available from: <https://www.coorpacademy.com/en/blog/learning-innovation-en/future-of-jobs-the-top-10-skills-to-be-developed-by-2025/>.
- [6] Gartner, *Executive Guidance: Digital Dexterity at Work*, December; 2018. Available from: <https://www.gartner.com/en/executive-guidance/digital-dexterity>.
- [7] Bonnet D. & Westerman G. *The New Elements of Digital Transformation*. MIT Sloan Management Review, Cambridge. 2021; 62 (2): pp. 82-89.