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Future of digital work: Challenges for sustainable human resources management

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ABSTRACT

This research aims to present a synopsis of four eminent theoretical concepts that scholars have expended to help understand how digitalisation has changed the workplace as we used to know it. The research is based on a conceptual approach. It aims to critically synthesise the relevant literature as the principal methodology for analysing work in the selected four research domains where the perspective on digital work is most controversial. The study shows two central chronicles that have emerged due to workplace digitalisation - utopian and dystopian perspectives. The research sheds light on controversial discourses regarding changing nature of work in the digital era, particularly concerning work polarisation, non-standard employment, unemployment and platform work. The study also provides guidelines for change that help minimise the dark side and harm to the worker of digitalisation by developing appropriate capabilities for the new digital environment.

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Introduction

The transformations of the workplace in the 20th Century owing to digital technology have been nothing short of revolutionary (Brynjolfsson & McAfee, 2011; Ford, 2015; Makridakis, 2017; Valenduc & Vendramin, 2017; Xin & VincentKow, 2022). Digital Transformation is the move from 19th and 20th-century mechanical and analogue electronic expertise to digital electronics. The precipitous and dynamic rise of digital technologies has had an immense impact on all aspects of life, but perhaps non-more than on every aspect of the way we learn, teach, work and the management of employees at work (Szymkowiak et al., 2021). Digitalisation in the workplace has enabled technology to increase workplace efficiency via data, applications, and the collaboration tools required for employees to work on any device, anytime from anywhere, enabling productivity and problem-solving. Cijan et al. (2019) have described a digital workplace as the virtual, contemporary interpretation of conventional employment. We concur with this broad definition. Digitalisation is not just a buzzword; it has an instant and immense influence on the workplace and business (Bresciani et al., 2021).

The way employees are workers in the era of digitalisation is termed 'algorithmic management' and depicts human resource management (HRM) practices in the contemporary digital economy. Digitalisation is one of the fundamental processes of technological

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change that has touched every HRM process (Lumi, 2020). It is a valuable lens to unravel the complex relationship between HRM algorithms, job autonomy and the value to workers who are subject to algorithmic management (Meijerink & Bondarouk, 2023). This algorithm is embedded with rules and resources; for example, while limiting job autonomy and value (Gandini, 2018; Kellogg et al., 2020; Newlands, 2021), it simultaneously can increase job autonomy and value to workers by 'algoactivism' (Kellogg et al., 2020). Indeed, the workplace has not witnessed such titanic transformations since the first industrial revolution (Ford, 2015; Srnicek, 2016; Van Dijck et al., 2018).

Digital platforms are technical infrastructures that embed digital platforms built on the widespread availability of continuously changing information technology, such as cloud computing, in-memory databases, and analytical solutions for big data (Hein et al., 2020). The push toward digital transformation is motivated by the belief that new technologies have great potential to drive Innovation, efficiency and competitive advantage (Ballestar, Camiña, Díaz-Chao, & Torrent-Sellens, 2021; Solberg et al., 2020). For instance, multinational corporations (MNCs) such as Google, Facebook, Uber, and Air BnB have seen unprecedented mega growth, primarily driven by the digital platform business ecosystem (Hein et al., 2020) and digital materiality of Innovation (Švarc, 2022; Yoo et al., 2012). Against this background, these disruptive technological progressions impact all organisation and business processes in the manufacturing and service sectors, affecting how we communicate, learn, plan and even think at work (Muzio et al., 2021).

The rise of the service economy, the creative economy, and the creative class (Florida, 2002) brought about ambivalence and uncertainty in our shared understanding of the social function of work (Strangleman, 2016). While the rapid expansion of digital technologies-initiated trends of de-professionalisation, decomposition, and commodification concerning standard jobs and professions (Susskind & Susskind, 2015). The rise of the post-modern society (Bauman, 1998), new capitalism (Sennett, 1997), and informationalism (Castells, 2004) provided a glimpse into an unprecedented and widely uncertain era in the realm of work. This gave rise to ideas about the end of work (Rifkin, 1995), the death of professionalism (Broadbent et al., 1997), loss of control over work and life (Sennett, 1998), and the gradual transition from a labour society to a risk society (Beck, 2000). The classical concepts in the sociology of work, such as its relation to industry or employment (Halford & Strangleman, 2009), and the character of the entrepreneur, worker, or employer (Degryse, 2017), are essential factors in managing crisis and stimulating economies (Kariv, Cisneros, Kashy-Rosenbaum, & Krueger, 2022) and now command new definitions.

A case in point is the change in nursing, one of the world's oldest professions. According to Kirk et al. (2019), many examples show how digital technologies have brought immense change for the registered nurse (RN) in western economies. Capabilities required by an RN in 1972 (50 years ago) bear little resemblance to the capabilities needed in 2022. Nursing in 1972 required soft capabilities embodied in compassion, patience, and routine techniques involving hygiene, nutrition and care of the environment (Sochalski & Weiner, 2011). However, due to digital technologies, nursing has become very technical today, requiring new capabilities to manage eHealth, mHealth, telehealth, wearable devices, and personalised medical devices-which are vital for the narrative of digital health (Brice & Almond, 2020).

The RN is not unique in this regard. To improve efficiency and effectiveness, all modes of an organisation require flexibility at both the organisational and individual worker levels (Maley, 2019; Susskind & Susskind, 2015). Consequently, it is essential; for the organisation to develop individual employee capabilities to manage the dynamic (Warner & Wäger, 2019) and turbulent (Maley, 2019) workplace. According to McKinsey (2022), one of the most vital leadership challenges of the modern workplace environment is the quest to develop the appropriate worker capabilities. Key themes include virtually managing and motivating performance while integrating such feats as talent management and employee engagement (Santana & Cobo, 2020). This is especially important for younger people who show a flair for entrepreneurship (Kariv, Cisneros, Kashy-Rosenbaum, & Krueger, 2022). Consequently, the future of work depends on employees' and organisations' flexibility and agility to new technological developments (Badnar & Welch, 2019). The challenge cannot be understated and begins in educational institutions, recruitment, organisational onboarding and continuous upskilling and capability development to match the digitalisation era.

Undeniably, there are inordinate challenges in managing the transition to the digitalisation of work. Scholars still need to determine a coherent theory or analytical-normative framework with which we can assess how digital technologies affect the nature of work, social relationships, and structures. Consequently, the present research aims to encapsulate the most controversial contemporary theoretical inquiries concerning the changing nature of work. This study endeavours to contribute to the extant literature by clarifying the existing theoretical approaches and, in addition, answering five fundamental research questions:

RQ1: *What are the main theoretical controversies regarding the digitalisation of work?*

RQ2: *What are the future trends in digitalisation research?*

RQ3: *Which workplace capabilities are required to cope with new digital marketplaces?*

RQ4: *What social challenges of digital work require critical theoretical analysis?*

RQ5: *How can theoretical insights help support a sustainable workplace to ensure the prosperity of workers in the digital era?*

This paper examines two dominant models - utopian and dystopian narratives that have been unfolding across digital work and workforce platforms since the early days of the ICT revolution (Kenney & Zysman, 2016; Švarc & Dabić, 2021). The current study contrasts these two basic narratives in four selected areas rich in theoretical controversies regarding the future of work. It could potentially serve as the basis for a broader research agenda. These are (1) technological changes towards the digitalisation of work, (2) labour platforms; (3) the polarisation of work; and (4) non-standard employment (see Table 2).

The contributions of this research are twofold. Firstly, the research sheds light on theoretical socio-political controversies regarding the future of digital work, particularly concerning technological unemployment, platform work, work polarisation, and non-standard employment. This study adds to the mounting scholarly literature on the transformation of work, shaped by the three socio-technological megatrends: globalisation of the labour market, the rise of the intangible economy, and platform capitalism/society. Secondly, the study provides insights into the four controversial approaches to digital work. It also outlines the future research trends that require profound and critical social analyses to provide guidelines for policy measures to facilitate positive change and sustainability in the labour market in the digital economy.

The current research is conceptual. The principal methodology is a critical qualitative analysis of literature resources in the four areas where discourse on the future of work is mainly controversial. There are various methods of literature review approaches, of which the systemic approach, semi-systemic approach, and integrative approach are the most common (Torraco, 2005; Raju & Phung, 2021; Snyder, 2019). A systemic literature review focuses on quantitative and qualitative analysis of an entire body of knowledge. By contrast, a semi-systemic or narrative and integrative approach is generally designed for subjects conceptualised differently by scholars from various disciplines, inhibiting the entire systematic literature review methods (Raju & Phung, 2021; Snyder, 2019). Most integrative

literature reviews intend to address two general kinds of topics - mature topics or new, emerging topics (Torraco, 2005). This approach appears the most productive for this study in terms of a critical literature review, which leads to a preliminary conceptualisation of the topic (Torraco, 2005). This methodological approach allows us to contrast the theoretical frameworks, perspectives and narratives regarding the evolution of work driven by digital technologies, pointing to the difficulties in modern work and industrial relations that require concerted policy actions and relevant public policies.

Accordingly, our objective here is to understand the development, direction, and purpose of existing research on the effects of technology on the workplace. We commence with a critique of the global megatrends towards the digitalisation of work and labour platforms and their effects on work and organisations. In our second section, we focus on the narratives of the future of work. A third section responds to and reflects on the research questions and considers the effects of technology on worker capabilities. Following this, we discuss the potential of a sustainable HRM approach that may overcome digitalisation's limitations on the workforce. Next, address the five key research questions above and outline potential areas for future research and practical implications of developing hard capabilities as part of a sustainable approach to HRM in the age of digitalisation.

The global movement (megatrends) towards the digitalisation of work and labour platforms

While the terms 'digitisation' and 'digitalisation' are often used synonymously, there is a difference. *Digitisation* is a verb that refers to the technical process of data conversion from analogue to digital bits. In contrast, *digitalisation* is a noun that depicts the augmented use of digital and computer technologies in the workplace. At the macro level, digitalisation has created intense changes in society and industry (Majchrzak et al., 2016). It has enabled organisations to innovate (Hess et al., 2016). However, the impact of digitalisation on the workforce can have different latitudes for different skill sets, as outlined above. There are numerous risks and threats, particularly for the low-skilled, poorly educated worker. This individual may need access to training or may need help to learn new complex issues. Due to poor education and confidence, they will have difficulty securing new employment. Most recent jobs now emerge in science, technology, engineering and mathematics (STEM) areas (see Table 1).

Sociologists and economists have asserted that knowledge has become more critical than capital and land (Holmwood & Marcuello Servos, 2019). According to ILO (2018), casual observation suggests that the impact of digitisation will be particularly disruptive. The term disruptive technology, first documented by Christensen (1997), described the new technology as either sustaining or disruptive. Sustaining technology refers to steady improvements to traditional technology. Disruptive technology, on the other hand, is unique, typically has performance problems, and may still need an established useful function. Thus, it can unsettle or disrupt how work is done in organisations (Cascio & Montealegre, 2016). Undeniably, new jobs will be created, and positions will change, but most distressing, there will be many job losses in many industries. Unemployment levels will rise, and salaries overall may not increase (Cascio & Montealegre, 2016). Therefore, not surprisingly, the driving force behind research into the digitalisation of work is the transformation and loss of jobs due to computer automation.

Frey and Osborne (2017) estimate that almost half (47%) of all US jobs will be subject to automation over the next few decades. While job susceptibility to automation varies across countries (i.e. 47% in Sweden to 62% in Romania) (McKinsey, 2017), technological change does favour workers with expertise in ICT (McKinsey, 2022; OECD, 2019). Digitalisation needs workers with high levels of expertise. Workers without this expertise will be at risk of unemployment, leading to dramatic consequences on the structure of society, economic growth, and personal existence. Scholarly interest in the mechanism of work digitalisation has thus significantly increased (Vial, 2021). It has also dispersed over a range of scientific disciplines, converging to emphasise three socio-economic and technological megatrends shaping the transformation of work. These trends are 1) the globalisation of the workforce, 2) the rise of the intangible economy, and 3) the rapid rise of platform capitalism- the three directions will now be examined more closely.

The globalisation of the labour market

The first megatrend refers to the globalisation of the labour market. According to Friedman (2005), this trend has flattened the world. Friedman considers the world is flat due to the increasingly globally competitive marketplace where emerging markets are levelling, and digitalisation enables the mobility of the workplace. Nonetheless, the flattening of the world has several negatives producing inequality (Freidman, 2005). For example, relocating industries and businesses to areas of higher profits (e.g., the Chinese shock) and instigating a parallel weakening of local labour markets exposed them to a depression of job opportunities, wages, and stagnant business dynamics (Pinney, 2014). Local workforces have to compete with global digital labour platforms. These penetrate the local business arena, where locals are often disadvantaged by poorer education and skills and weak local digital infrastructures (Vial, 2021). The discourse on the impact of globalisation on the workforce has taken several directions. However, scholars have paid scant attention to the downfall of the organised workforce and the harm of a neo-liberal orientation (Mariappanadar, 2012) during digitalisation. Technology can support or repress the workforce (Coovert & Thompson, 2014), and the implementation of digitalisation echoes both of these outcomes (Cascio & Montealegre, 2016).

The rise of the intangible economy

The second megatrend pertains to the rise of the intangible economy (Haskel & Westlake, 2018). It included the digital transformation of organisations, involving the incorporation of an entirely new business model that integrates digital technologies and business processes (Nambisan et al., 2017). It assumes a paradigm shift in the business organisation towards horizontal and vertical integration of the entire production system. In manufacturing, these changes are considered part of Industry 4.0. Under the industry 4.0 platform, machines can perform/optimise the production process without human intervention by using cyber-physical communication systems between the real and virtual worlds (Hirsch-Kreinsen, 2016). Manufacturing, in particular, has benefited from I.4.0 in the form of smart factories, blockchain, connected supply chains, big data analytics, and an efficient logistics process (Bertello et al., 2021; He et al., 2021; Schneider, 2018). Concepts such as artificial intelligence (AI), the internet of things (IoT), data analytics, robotics, social connectivity, gig work, and hybrid workforce models blend into aspects of I.4.0

Table 1
Impact of digitalisation on the workforce.

Opportunities	Threats
Increased opportunity for well-qualified workers	Job loss for low-skilled workers
Improved working conditions for well-qualified workers	Limited capabilities of workers & the education system to adapt to changing skills needs
Improved remuneration for well-qualified works	Labour shortages in STEM -require workers with multidiscipline capabilities.
Ability to work anywhere	Increase involuntary atypical employment

Note: Adapted from Eurofound, 2022.

(He et al., 2021; Shet & Pereira, 2021). Indeed, technological principles have increased productivity (Črešnar et al., 2022).

Economists usually define digitalisation as job automation utilising computer-controlled equipment (Frey & Osborne, 2017). In sociological terms, an organisation's digital transformation is a complex, socio-technical, cultural phenomenon (Hirsch-Kreinsen, 2016). There is little doubt that the development of digital technologies has opened up entirely new qualities of application that are not fundamentally analogous to earlier decades. That is the challenge for managing the workforce in organisations everywhere in every industry: '*Innovation is hurtling us toward a new industrial revolution. Smart corporate leaders know they have to either figure out how these technologies will transform their businesses or face disruption by others who figure it out first.*' (Murray, 2015:6).

The rapid rise of platform capitalism

The third megatrend refers to the rapid rise of platform capitalism (Van Dijck et al., 2018). Platform capitalism, navigate digitisation and neoliberalism. Platform capitalism facilitates commercialising goods and services for profit maximisation (Srnicek, 2016). The impact of platform capitalism is frequently interpreted through the behaviours of mega MNCs termed the 'big five' infrastructural companies - Amazon, Apple, Meta, Google, and Microsoft. These MNCs have established new economic models and value chains grounded in network effects and platform structures. They ruthlessly destroy their competitors and entire industries and change the familiar work models.

Many standard jobs transform into work in labour platforms (Kenney & Zysman, 2016; Scholz, 2016). The advantages include efficient asset utilisation, increased productivity, and additional income (Evans & Gawer, 2016); the disadvantages include decomposing work into micro-tasks or gigs. A 'gig' refers to the preponderance of short-term contracts or freelance work instead of permanent jobs. The increase in the gig economy has seen the rise of non-standard work and inconsistent work opportunities that lack dignity and security (Codagnone & Martens, 2016; ILO, 2018).

There needs to be more consensus regarding the impact of these megatrends on jobs and employment. Scholars, and commentators alike, are divided on the consequences, with some more optimistic than others. On the one hand, pessimists make doomsday predictions for a dystopian future of work, painting a bleak picture of future job destruction, polarisation, and rising social inequalities. On the other hand, optimists adopt a utopian perspective, boosting productivity, flexibility, creativity, abstract reasoning, and new, good-quality job opportunities (OECD, 2019). Given the high dependence on technologies across organisations, the question of how technology changes work is highly relevant for scholars. Suppose one accepts the idea that work does not exist without people. In that case, scholars bear some responsibility for understanding the effects of technology on work and organisations (Cascio & Montealegre, 2016).

Narratives of the future of work

This section seeks to identify and analyse four controversial work topics in the digital era: a technological change towards the digitalisation of work, labour platforms, the divergence of work, and non-standard employment.

Technological change towards the digitalisation of work

The mechanism that enabled employment growth in the transition from an agrarian to an industrial society is not transferrable to the transition to a digital economy. More jobs will be automated soon (Frey & Osborne, 2017) or may even disappear completely (Hirsch-Kreinsen, 2016). This pessimistic perspective (LaGrandeur & Hughes, 2017) implies an increase in technical efficiency above the level of labour absorption (Hirsch-Kreinsen, 2016) - a phenomenon observed by Keynes in the 1930s (Keynes, 1930). The pessimists of digitalisation argue that market economies are entering a period of secular stagnation (Cowen, 2011; Gordon, 2016), suggesting that today's Innovation centred around entertainment (e.g., games and social networks) will not contribute to economic growth. Moreover, they argue that the internet revolution still needs to elevate living standards, especially for those at the bottom of the income scale.

While digitalisation is a crucial driver of aggregate economic growth, income gains vary significantly across countries. Growth is consolidated in a small number of MNCs (i.e. Google and Twitter), resulting in the soaring wealth of the top 1% of capital owners (1% to 5% of the population). Six of the world's wealthiest men in 2022 (Musk, Bezos, Gates, Page, Brin, Ballmer) made their fortunes in technology. Many of these billionaires have their wealth still invested in the companies they founded (Bloomberg, 2022) and can still borrow against their wealth. Therefore, they benefit from an array of tax deductions to offset reported income, often avoiding income tax for years (Gaskell, 2022).

However, this massive rise in wealth has yet to contribute to median family incomes at a national level (Pinney, 2014). This concentration of wealth and the political power of the minority often suppresses competition. It encourages 'rent-seeking' elites, businessmen whose profits owe more to favourable regulation and political connections than Innovation and efficiency (Pinney, 2014).

The optimists of digitalisation see these changes as a 'major restructuring' that requires new work skills and work organisation (Hirsch-Kreinsen, 2016) to enrich lives, businesses, and the world's economy (Brynjolfsson & McAfee, 2011; Makridakis, 2017). They believe that computers can improve our mental strength, just as the steam engine improved our muscle strength in the past, and bring about revolutionary changes comparable to the electrification of the late nineteenth Century.

The optimists argue that digital technologies lead to zero marginal costs (Chen et al., 2022; Rifkin, 2014), free services (Anderson, 2009), work enhancement through robotisation (Graetz & Michaels, 2018), the transformation of education (Demartini et al., 2020), and the empowerment of workers through a network of micro-entrepreneurs (Sundararajan, 2017). Others see that some tasks will be challenging to automate because they neglect workers' creative and social intelligence. Nevertheless, despite the loss of some jobs, econometric studies demonstrate the positive impact of digitalisation. They stress the positive aspects of broader applications, lower prices, increased productivity, and the opening of new job markets. These scholars emphasise that creating new jobs will always eventually outweigh the loss of old jobs (Arntz et al., 2016; Jarrahi, 2018; MacCarthy, 2014). These authors reason it is time to eradicate the myth of technological job loss because history has shown that such anxieties never come to fruition.

The world at our fingertips: an analysis of the global digitalisation of work platforms

The world is your office: global digitalisation of work and labour platforms

Over the past few years, businesses using the platform business model have seen explosive growth. Platform business models have arisen in a variety of sectors, from retail (eBay, Amazon), banking (Zopa), food delivery (Delivery Hero), and travel (Airbnb), to transportation (Uber, BlaBlaCar) (OECD, 2019). These models challenge our existing approaches and, as such, can sometimes lead to regulatory controversy (e.g., taxes).

Labour platforms assume an increasingly important role in the workplace through network effects, company concentration, and obscure algorithmic management, thus impacting many people's

lives (Huws et al., 2019; Keynes, 1930; Pesole et al., 2018). These platforms provide a new socio-technical work system (Kittur et al., 2013), representing a unique governance mechanism that differs from the conventional labour market (Vallas & Schor, 2020). Disrupting the labour market and labour-capital relations, the boundaries between employees and employers become blurred. There are several concerns surrounding the idea that platform-mediated work might reach a dominant market position, which would then impact work arrangements socially and culturally (Degryse, 2017; Huws et al., 2019; Srnicek, 2016).

Our existing notions of employment are changing. Anyone can make money if they have a smartphone, tablet, computer, or Internet connection (Degryse, 2017). It is now possible to start a company and establish a standing that would have previously only been accessible to those with capital. Platform work is especially beneficial for low-income households. As a result of these methods, these households are no longer restricted by local job markets and can often reach better pay rates by expanding their reach through global platforms (Lehdonvirta et al., 2018). Vulnerable working groups (disabled, older workers, uneducated, young, long-term unemployed, and migrants) can also benefit from fewer entry barriers (Pesole et al., 2018).

Supporters of labour platforms posit that algorithmic management frees workers from tedious jobs and traditional or outdated work environments. In turn, allowing them to escape from strict institutionalisation (Codagnone & Martens, 2016) and, instead, have the freedom, creativity, flexibility, and entrepreneurship to try something different. Workers can adopt different types of flexible or freelance work, thus becoming “molecular capitalists” (Armano & Murgia, 2013) or self-employed micro-entrepreneurs (Sundararajan, 2017). Workers can adopt different types of flexible or freelance work, thus becoming “molecular capitalists” (Armano & Murgia, 2013) or self-employed micro-entrepreneurs (Sundararajan, 2017). These jobs can often prove more lucrative than traditional employment in corporations with established hierarchies and strict regulations (Sundararajan, 2017). Optimists argue that digitalisation, therefore, has the potential to end employment altogether without ending work itself. As new labour forms enter the workplace, discussing labour rights, employers, employees, permanent labour contracts, precarious work, or even the national unemployment rate can become fruitless.

More sceptical approaches tend to view the status of independent contractors as especially problematic, as they challenge the legislation on social security requirements and general working conditions. Further clarification, therefore, seems necessary concerning the employment status of platform workers (Pesole et al., 2018). One of the biggest criticisms of platform work is digital crowd work. Digital crowd work distributes many micro-tasks to hundreds (or even thousands) of workers from around the globe, otherwise known as a ‘dispersed crowd’ (Frey & Osbourne, 2017; ILO, 2018; Irani, 2013; Kittur et al., 2013). Crowd work assumes that human labour divides into components or gigs. These gigs involve coding, labelling, and describing items. These menial tasks can often gradually diminish complex and professional work, skills, and expertise.

This Tayloristic fragmentation of work through emerging digital technologies is exemplified by Amazon Mechanical Turk (AMT). The AMT labour platform, launched in 2005, comprises over half a million Turks working from 190 countries (Irani, 2013). Jobs are reduced to slave clicking (Milland, 2017), which is when the worker essentially acts as a computer processor and becomes a component of a more extensive and more distributed computer system (Codagnone et al., 2016; ILO, 2018; Irani, 2013; Kittur et al., 2013). Many analysts argue that platform work is a precursor for a dystopia because it undermines the need for reasonable wages, good quality of work, worker dignity, social solidarity, and security (Cherry, 2016; Degryse, 2017).

An ATM worker earns, on average, $166 per week, which amounts to five cents for 55 clicks (Cherry, 2016). Working practices are incredibly chaotic, and these methods can therefore lead to increased psychological and physical pressure (Cherry, 2016), social disruption, and the loss of expertise and professional careers (Garben, 2019).

The polarisation of work

Dividing or polarising work into either "lousy and lovely jobs" (Goos & Manning, 2007) is spurred on by partisan technological progress or building invisible barriers among different pyramids of jobs (Meske et al., 2020). Higher levels of education, sophisticated analysis, advanced problem-solving capabilities, and abstract jobs, such as managerial, professional, and technical occupations, are favoured by this progression. Educated roles are well-paid (Goos et al., 2014). Optimists look forward to the rise of creative work and the eventual removal of alienated, monotonous, and repetitive tasks. Pessimists fear increasing polarisation, inequality, and precarious working positions as mid-level and mid-wage jobs gradually disappear. Many routine tasks, such as clerical and repetitive production, require workers to have modest qualifications. If these jobs are replaced, then even mid-level workers face being made unemployed, being transferred to lousy platform work, or being moved into non-routine service employment on a lesser wage. This situation would mean that both poorly educated workers and those in the middle class could risk losing their jobs. Any position that could be replaced through algorithmic processing and automation could ultimately disappear. Very high and very low-paid jobs at each extreme would increase (Makridakis, 2017; Scholz, 2016).

Tyler Cowen (2013) posits that technological evolution will transform our working population into either an economic loser who lacks the skills and capabilities needed to work alongside computers or economic elites who handle ICT. Cowen predicts that a small hyper-meritocracy of approximately 10−15% of workers will become wealthy and lead exciting lives. The remaining 85−90% will be placed into slavish and insecure working environments, watching their wages either decrease or stagnate. Alternatively, as optimists argue, the digitalisation of jobs could increase competition between different companies and workers. This could improve education levels and wages, as demonstrated by introducing most new technologies (Arntz et al., 2016) over the last 30 years. Many theorists have observed the emergence of new mid-level ICT jobs, including developers, coders, computer scientists, and logistic specialists (Arntz et al., 2016; Palier, 2019), disparaging theories on the potential disappearance of the middle classes.

Theorists concerned about the polarisation of jobs argue that the gradual diminishment of the mid-skill employment job market will lead to various types of non-standard work. Armano and Murgia (2013) assert that many young and well-educated workers exist in a new class bracket: the precariat. They are often exposed to existential insecurity as work is deregulated. While this benefits liberal capitalism, it adversely impacts social relations. These individuals will have lower wages, and their means of acquiring vertical social mobility will be restricted. If this happens, unconditioned basic income (UBI) and a strong welfare state with free health care and education could become necessary (Ford, 2015; Palier, 2019; Scholz, 2016; Standing, 2017). Polarisation often results in inequality between workers and society more broadly. Winners will emerge through superstar firms like Google or Facebook (Van Dijck et al., 2018), and there will be a handful of billionaires, such as Jeff Bezos, the founder of Amazon. These entities can afford to act on the fringes of legal requirements due to their financial and lobbying power. At the same time, the average household income will fall (Brynjolfsson & McAfee, 2011; Ford, 2015), and digital slaves or precarious workers will attempt to survive on labour platforms. These platforms will mean that measures for social protection and social inclusion will become essential functions of the state.

Non-standard employment

Non-standard work models include labour platforms that subvert traditional business models. These platforms pose several ethical, legal, and regulatory issues regarding workers' protection, as such rulings existed before the digital age (Todoli-Signes, 2017). Platform work is often linked to job insecurity, poor working conditions, low wages, and civil exclusion. This leads to a situation that creates a mass class of precariats (Standing, 2017), cybercariat (Todoli-Signes, 2017), globalisation losers (Degryse, 2017), and inequalities in poverty and socio-economic factors more broadly (Atkinson, 2015).

Platform workers essentially serve as a virtual community of micro-entrepreneurs, partners, and subcontractors (Palier, 2019; Todoli-Signes, 2017). These digital precariat workers, however, must learn to manage their retirement pension, social protection, unemployment, and occupational sickness provisions (Degryse, 2017). The platforms they work on are usually not subject to taxation or social security contributions (Palier, 2019). Vital worker protection schemes, which, until now, were typically provided by institutional employers, are no longer the responsibility of the organisation (Ford, 2015). Workers' legal status thus collapses, and labour rights are eroded. Socio-economic researchers and public policy decision-makers must therefore act quickly to expose the potential ramifications of digital working practices in order to prevent the degradation of workers and the loss of their working rights (Cherry, 2016; Garben, 2019; ILO, 2018; Makridakis, 2017; Scholz, 2016).

This could enhance social protection if the digital labour market were fairly taxed and regulated (Todoli-Signes, 2017). Large MNCs have put forward several measures, proposing improving platform workers' working statuses (McKinsey, 2017; OECD, 2019). Regardless of these efforts, digital labour is incredibly complex and is unaffected by national socio-political regimes, institutions, and forms of capitalism (Huws, 2003). Labour regulations should therefore be widespread. They should be implemented across Europe and worldwide (Garben, 2019).

Sustainable human resource management

A sustainable approach to HRM has the potential to overcome the harm of digitalisation in the workplace (Aust et al., 2020) and contribute to the achievement of the UN's Sustainable Development Goals (Kramar, 2022). Sustainable HRM illustrates a long-term picture that assumes a sustainable approach to overseeing the workforce (Ehnert, 2006, 2009; Guerci & Pedrini, 2013; Kramar, 2013; Mariappanadar, 2003, 2012). This approach aims to contribute to economic, social and environmental performance symmetry. Consequently, it moves past the traditional short-term focus where organisations balance financial efficacy and sustainability over a more extended period. In particular, sustainable HRM can provide more flexibility to the organisation and its workforce in digitalisation (Aust et al., 2020).

Sustainable HRM helps achieve a triple bottom line based on environmental integrity, social equity and economic prosperity (Ehnert, 2009). However, implementing the triple bottom line can cause tensions, paradoxes and contradictions (Keegan et al., 2019). Paradox theory provides insights into this problem, illuminating that contradictions will occur when interdependent contradictions function simultaneously (Berman et al., 2021; Guerci & Carollo, 2016). Paradox scholars argue that managers need the capability to acknowledge the tensions that may surface from the paradox and manage the constitutive poles simultaneously instead of choosing only one of them (Kramar, 2022).

Although sustainability has been the subject of study and reflection in management for a long time, the relationship between sustainability and HRM has recently received attention from scholars (Aust et al., 2020). Sustainable HRM emphasises critical processes such as training, development, fair pay, deployment and release of employees (Kramar, 2014). The benefits of sustainable HRM include reducing the undesired impact of downsizing activities (Mariappanadar, 2012); supporting talent management (Boudreau & Ramstad, 2005); creating a better-quality ethical climate (Guerci et al., 2013; Mariappanadar, 2012), providing fair remuneration (Maley & Kramar, 2015), and lessening the harm of work (Mariappandar, 2012).

Sustainable HRM also considers the importance of HRM at macro, meso and micro levels, and it acknowledges the importance of the effective long-term management of employees (Ehnert et al., 2015). Indeed, sustainability scholars argue that fostering sustainable HRM will become a 'survival strategy' for MNCs (Kramar, 2013) dependent on high-quality employees with the necessary capabilities for any new demand (Maley, 2019). The case at the macro level declares that the HRM arena can no longer neglect the external societal move towards digitalisation; it has the potential to make significant contributions (Ehnert et al., 2015). The meso and micro-level arguments involve addressing the internal HRM systems and are associated with the importance of the effective long-term management of employees.

Linking Sustainable HRM to digitalisation Bresciani et al. (2021) puts forward that HRM has a leading role in digital transformation, enabling this transformation and balancing the interests of the organisation and the people working in it. Nevertheless, before the HRM can undertake a sustainable role in the digital environment, it must transform HRM practice and profession, and managers must develop the capabilities to manage the triple bottom line allied with sustainable HRM (Kramar, 2022; Maley, 2019)

Hence digital transformation of work, accompanied by the digitalisation of HRM and sustainable HRM, have a reciprocal mutually beneficial relationship that can help to create sustainable organisations (Kuzior et al., 2021). For example, sustainable HRM supports digitalisation by developing appropriate individual worker capabilities. Sustainable HRM has the potential to satisfy a broader range of stakeholders through the new industrial revolution providing the workplace.

Discussion and conclusion

The primary objective of this conceptual article is to encourage theoretical discussions regarding the future of digital work. This endeavour might have practical implications for public policies at the macro-level to facilitate positive change concerning the digital labour market and sustainable HRM at the micro-level for managing digitalisation at the workplace. The research described, through the lenses of pessimistic and optimistic narratives, outlines the considerable uncertainty about the future of digital work and its potential to create either a utopian or dystopian labour world (Hirsch-Kreinsen, 2016).

In the introduction, we posed five research questions. The main findings of our research point out firstly that digitalisation has impacted the basis of our theoretical perception of work. We can observe two researchers' tendencies in this regard: those with a more positive outlook and those with more pessimist viewpoints. Hence digitalisation is viewed as a trend with both good potential and shortcomings. Our findings also highlight that sustainable HRM is essential in the digitalisation era for ensuring workers' motivation and capacity building. This determination is in line with Richards (2022), who proposes that employees rather than employers are the central feature of sustainable HRM practices. Finally, in answering our research questions, we also provided directions for future research, including those that merit critical and theoretical analysis. Below we discuss the findings related to each research question we posed in more detail.

The first question asked: *what are the main theoretical controversies regarding the digitalisation of work*? This study identifies four theoretical themes. These themes reveal how digitalisation has destabilised the foundations of our approach to work (Table 2). Significant polarisation occurs between pessimistic and optimistic viewpoints. On the one hand, dystopian perspectives range from slight

Table 2
Socio-economic themes and narratives of the future of work.

Themes under discussion	Positive narratives	Negative narratives	Future research themes	Practical implications
Technological change towards digitalisation of work	Boosting productivity; new, good quality job opportunities	Technological unemployment; job destruction; mass unemployment; income and social inequality	Social function of work; occupational exposure to technological progress	Work competencies; Sustainable HRM
Labour platforms	Additional income; easy labour market access; freelance, escapism from institutional rigidity; jobs for vulnerable groups	Alienation of work; "lousy jobs", polarisation of work; non-standard employment	New work organisation, occupations, education, and skills	Working conditions of platform workers
Polarisation of work	Rising competition; upskilling and creative thinking; new mid-level jobs related to ICT	Deskilling; vanishing of mid-level jobs and middle class	Class identity and social stratification	Social protection of vulnerable groups, education policy
Non-standard employment	Flexibility; freedom; entrepreneurism	Poverty and precarity; deregulation of work, erosion of social protection; insecurity	Social inequality and inclusion	Labour market regulations

pessimism (disappearance of the middle class and the reduction of jobs) to apocalyptic ideas about social chaos, the end of work, and the removal of labour rights, all of which arise from increasing social stratification, exclusion, and inequality.

On the other hand, optimistic theorists predict that new technologies will render old jobs obsolete, creating jobs of higher quality with better degrees of abstraction and complexity. These utopians posit that these new technologies, such as robotics and AI, will improve our work and general well-being more than the industrial and digital revolutions. This research suggests that discussions regarding the impact of digital technologies on employment and work remain unsteady and ambivalent (Pesole et al., 2018).

The second question inquired: *what are the future trends in digitalisation research*? McKinsey (2021) stated that scholars should primarily examine leadership challenges in contemporary working environments, especially regarding managing and motivating workers virtually. There is much scope for future research in this area. Worker individual resilience is another digitalisation topic that deserves more attention. While scholarship has identified that specific HRM strategies can help build and strengthen individual workplace resilience, future research needs to explore how resilience could enable individuals to manage their stress levels better. Such an initiative could improve workers' overall health and productivity (i.e., Meneghel et al., 2016; Seery et al., 2013). HRM strategies should include the role of entrepreneurial education and support in business growth intention (Kariv et al., 2019). The role of resilience in digitalisation has also been under-researched. There are many potential avenues for future researchers to take to establish more comprehensive theoretical frameworks. Further research would enable us to understand better how digital technologies impact work, relationships, and social structures.

Question three probed: *which workplace capabilities were required to cope with new digital marketplaces?* Evidence suggests that hard capabilities (Campion et al., 2020; McClelland & Boyatzis, 1980) are more important than soft capabilities. Hard capabilities are needed to handle technological advances and understand novel practices (Hernandez-de-Menendez et al., 2020; Veile et al., 2022). The potential value of sustainable HRM systems for the digitalisation era of work seems clear even at this early stage of developing interest. As Mariappanadar (2022) point out – sustainable HRM is not just good corporate social responsibility. It reduces work harm and is potentially suitable for long-term economic success in digitalisation. Sustainability HRM could play an essential role in the digitalisation era.

The fourth question asked: *What social challenges of digital work require critical and theoretical analysis?* This paper argues that narrative contradictions show that social theories on work digitalisation are in their early stages. The phenomenon must be further conceptualised to identify utopian or dystopian trends in emerging labour market regulations, working conditions, and government policies. Science and technology studies and research analysing the sociology of Innovation often examine the links between social change and technological Innovation. The interplay between digital transformation, skill-biased technical changes and employment, digital Innovation, social welfare, and the meaning of work should be integral to this research. However, research on labour platforms is the most exciting and topical. It can instigate further social research related to new work organisations, education and skills, occupations, job quality, worker stratification, and job satisfaction. Polarisation, however, predicts an increase in workers employed at extreme poles. The number of mid-level jobs available thus decreases. As a result, research should focus on the potential for reduced upward mobility, new models of social stratification, and class identity formation. Non-standard employment enhances and encourages social inequalities. Sociological researchers should examine inclusion, social equality, and protection in this context.

Question five queried: *How could theoretical insights help support a sustainable workplace to ensure the prosperity of workers in the digital era?* Our position is that theoretical insight into socio-political controversies about digital work (e.g., work polarisation, non-standard employment) presents challenges for HRM. These challenges indicate that sustainable HRM has to manage work potentials to help alleviate the harm of digitalisation. There is a need for a more comprehensive agenda for HRM in digitalisation. For example, sustainable HRM practices have implications for entrepreneurship and Innovation in large organisations and the regions where these organisations exist. Sustainable HRM can foster workers' creativity and digitalisation skills, helping them be entrepreneurial in the digital environment. By helping workers familiarise themselves with creative and digital processes, sustainable HRM practices could reduce workers' stress associated with exposure to the online platform. At the same time, it could help improve their entrepreneurial capabilities and recognition skills (Phillips & Tracey, 2007) in the organisational or regional setting. Current research offers little insight in this direction so far. Ultimately, organisations must provide workers with the necessary capabilities to generate lasting performance outcomes, and one of the chief tenets of sustainable HRM is building up workers' appropriate capabilities (Maley & Kramar, 2015).

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