

# Can Digitally Transformed Work Be Virtuous?

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This essay inquires whether digitally transformed work can be virtuous and under what conditions. It eschews technological determinism in both utopian and dystopian versions, opting for the premise of free human agency. This work is distinctive in adopting an actor-centric and explicitly ethical analysis based on neo-Aristotelian, Catholic social teaching (CST), and MacIntyrean teachings on the virtues. Beginning with an analysis of digital disruption, it identifies the most salient human advantages vis-à-vis technology in digitally transformed work and provides philosophical anthropological explanations for each. It also looks into external, organizational characteristics on both the macro and the micro levels of digitally transformed work, underscoring their ambivalence (efficiency and profits vs. exclusion and exploitation, flexibility and freedom vs. standardization and dependency) and the need to mitigate their polarizing effects for the sake of shared flourishing. The article presents standards for virtuous work according to neo-Aristotelian, CST, and MacIntyrean frames and applies them to digitally transformed work, giving rise to five fundamental principles. These basic guidelines indicate, on one hand, actions to be avoided and, on the other, actions to be pursued, together with their rationales.

**Key Words:** digital transformation of work, virtuous work, AI ethics in business, neo-Aristotelianism, Catholic social teaching, MacIntyre

From a virtue ethics perspective, technology would be of interest not so much in itself as in how it affects human activity, particularly work, in the understanding that virtue or excellence in work directly impacts the achievement of flourishing as the final end. Faced with the fundamental changes digital technology brings to the world of work, a basic question virtue ethicists ask is whether digitally transformed work can be virtuous, and if it can, how.

There are basically two camps on this issue. First are the technopessimists or dystopians, for whom conditions for virtue in digitally transformed work do not obtain. What we have, above all, is an algocracy (the rule of algorithms) and workplace precarity (no job security, dismal wages, devalued work) (Cherry 2016), representing almost insurmountable stumbling blocks to virtuous human agency. Some dystopians fear that there won't be enough meaningful work (Bankins and Formosa 2023). Others are preparing for a postwork future, imagining institutions

that will distribute income beyond labor markets and current welfare systems (Korinek and Juelfs 2022). Second are the techno-optimists or utopians, for whom digitally transformed work favors virtue, underscoring the power of individual talent and autonomy (Rodríguez-Lluesma et al. 2021). On the basis of the “work from home” experience during the COVID-19 pandemic, certain authors defend that people have learned and adjusted, perceiving digitally transformed labor as a secure source of income and job satisfaction, with greater autonomy and flexibility (Nagel 2020). Still others think that risks of digital technological dominance may be managed through constructivist learning techniques, a better understanding of the psychological processes behind expertise development, and improvements in human–machine collaboration through heightened philosophical-ethical discourse (Sutton et al. 2018).

The future of digital work is not so much a fact as the result of conflicting narratives dependent on diverse economic, social, and political interests (Dries et al. 2023). Nonetheless, we seek to position ourselves regarding the aptitude of digitally transformed work for virtue as follows. First, we adopt an actor-centric view of digital transformation, as opposed to the more common technology-centered one (Nadkarmi and Prügl 2021; den Hond and Moser 2023). Next, we carry out an explicit ethical analysis based on contemporary virtue ethics tradition (Vallor 2016; Hagendorff 2022), acknowledging principles mainly from neo-Aristotelianism (Snow 2017), Catholic social teaching (CST) (Congregation for the Doctrine of the Faith 1986, 72), and the works of Alasdair MacIntyre ([1981] 2007, 1988, 1990). Although we use elements from sociology (Rodríguez-Lluesma et al. 2021), social psychology, organizational behavior (Trenerry et al. 2021), economics (Frey and Osborne 2017; Bowles 2014; Mokyr et al. 2015; Arntz et al. 2016, 2017; Nedelkoska and Quintini 2018; Acemoglu and Restrepo 2018, 2020), and information and communications technology (ICT) systems (Verhoef et al. 2021), they do not constitute our main vantage point. Our purpose is not simply to bring about a more efficient digital transformation (Trenerry et al. 2021), and neither do we focus on the ethically liminal perspective of meaningful work (Kim and Scheller-Wolf 2019; Mejia 2023).

Rather, and as a preview of our argument, we make the case that digitally transformed work *can* indeed be virtuous, albeit mindful that we’re considering a “best-case scenario,” because for many, particularly those low on digital skills, noncognitive or social skills, imagination, and creativity, the chances for achieving virtue-promoting conditions are dire. Digital transformation polarizes not only job availability and income but work conditions and quality as well. An important motivation, therefore, besides discovering the features of virtuous, digitally transformed work, is to extend these virtue-promoting conditions to those on the losing end. Thus we hope to contribute to “making the future of work” virtuous, instead of just waiting for it to happen (Dries et al. 2023).

After this brief introduction and expression of motivations, the rest of the article proceeds as follows. The next section investigates the salient features of digitally transformed work due to the impact of technology and organization. **Section 3** continues with an account of virtuous work from neo-Aristotelian, CST, and

MacIntyrean theories, and section 4 explains how the criteria for virtuous work apply to digitally transformed work. A final section bears the limitations of our study and avenues for future research.

## 1. THE FEATURES AND ORGANIZATION OF DIGITALLY TRANSFORMED WORK

The digital transformation of work often considers two main outcomes: first, the net effect of job creation and destruction, and second, how current jobs are “disrupted” by technology. We shall dwell preferably on the second (“disruption”), referring to the first (net jobs) only to the extent that it helps shape the new forms of work. The features of digitally transformed work constitute our primary interest, as they condition the exercise of virtuous work. Besides technology (Kane et al. 2015), we shall also study the consequences of organization, a factor seldom taken into account sufficiently.

Building on previous research on information technology-enabled changes (Besson and Rowe 2012; Wessel et al. 2020), Trenerry et al. (2021, 2) define *digital transformation* as “a process of *deep, structural change* that occurs through the *integration* of multiple technologies and [that] fundamentally *redefines* organizational value and identity.” It involves a cluster of “general purpose technologies” (Elondou et al. 2023) with potential to advance a “Fourth Industrial Revolution” (Marsh 2012; Schwab 2017; Knieps 2021), unprecedented in scale, speed, and scope (Matt et al. 2015). One part of the definition emphasizes the integration of “information, computing, communication, and connectivity technologies” (Vial 2019, 121; see also Agarwal et al. 2010; Berghaus and Back 2016). The other centers on human agents who decide shifts in organization, strategy, structures, products, processes, and overall business model (Hess et al. 2016), impacting workers and employees (Venkatesh 2006; Venkatesh and Bala 2008; Kaasinen et al. 2012). Despite increasing aggregate wealth, there are worries that digital transformation would widen the gap between rich and poor nations (Alonso et al. 2020) as well as between rich and poor populations within countries (Eubanks 2018).

Verhoef et al. (2021, 891–92) distinguish among three different stages in digital transformation. The first, *digitization*, consists in transforming analog information into digital formats computers can store, process, and transmit, such as filing income tax returns online, which hardly creates new value per se. Next comes *digitalization*, when ICTs alter and optimize business processes, for instance, when customers connect with firms through digital platforms, permitting enhanced customer experiences and cost savings. This process can be extended to logistics, distribution, or relationship management. Last is *digital transformation*, when ICT triggers pervasive changes in a company’s business model; think of advanced telemedicine and surgery (Medeiros 2023). Although there is no imperative to follow through, progress through each stage incurs corresponding demands on digital resources and modifications in firm structure and strategy. They represent different business goals as well as different ways and conditions of working.

Despite data from previous technological transformations in support of net job creation and rise in efficiency, anxiety over mass unemployment refuses to disappear (Federal Ministry for Economic Affairs and Climate Action [FMEACA] 2022). Perception of job loss is not the same as reality (Dahlin 2022). Nonetheless, this is a very human reaction wrought by uncertainty. The adoption of new technology is considered a “stressor,” reducing short-term worker well-being and satisfaction (Gavin and Mason 2004); and although technology is an external, environmental factor, there is a limit to skill challenges workers can bear (Warr 2007). Some authors fear that digital technologies like artificial intelligence (AI), automation, robotics, cloud computing, and the Internet of Things would displace workers altogether or substantially and quickly reduce their need (Acemoglu and Autor 2011; Frey and Osborne 2017; Brynjolfsson and McAfee 2014), whereas others optimistically predict that there will be enough replacement jobs (Arntz et al. 2017). Think of social media content creators, search engine optimization experts, professional e-sports players, and data science and predictive analytics specialists, none of whom existed scarcely a decade ago (Roose 2021). Most are engaged in invisible, background work (Gray and Suri 2019; Nardi and Engeström 1999). Either way, it will be an accelerated process, even exponentially so (Paolillo et al. 2022). The net effect on the number of jobs does not depend on technology alone because it varies according to task (Arntz et al. 2016, 2017), occupation (Nedelkoska and Quintini 2018), country (Lordan and Neumark 2018), and region. Regarding the use of large language models (LLMs) such as ChatGPT, Felten et al. (2023) find telemarketers and postsecondary English and literature teachers as the most exposed occupations, while legal services and investments in securities and commodities are the most threatened sectors. More generally, Elondou et al. (2023) assess that 80 percent of US workers will have at least 10 percent of tasks impacted by LLMs, while almost 20 percent will see at least 50 percent of tasks affected; about 15 percent of tasks can be completed more quickly without loss of quality.

Among nontechnological or human drivers of job maintenance and creation are worker adaptation, occupational composition, workplace organization, and innovations in business models and occupations. For instance, although accounting has a 98 percent probability of automation (Frey and Osborne 2017), clerks can adapt by engaging in problem solving or consultancy (Arntz et al. 2016; Nedelkoska and Quintini 2018). Manufacturing jobs have a higher substitution potential than services (Muro et al. 2019). Yet even in the same sector, such as in textile and leather, less than 50 percent of nonmanagerial, technical jobs are at risk in France, whereas in Poland, close to 70 percent are (Eurofound 2019) due to previous technological adoption. In Germany, thanks to works councils, companies favor the retention of firm-specific human capital, which translates into skills upgrading and staff retraining (FMEACA 2022). Also, the status of some German automotive firms as global leaders allows them to increase employment and efficiency while adopting advanced robotics. Digital transformation by itself does not spell job destiny.

What, then, are the features rendering jobs and tasks automation- or robot-proof? The best jobs create technologically enhanced long-term value, not only for workers,

but also for firms and society. We shall look primarily at jobs in advanced stages of digital transformation, identifying common characteristics in worker requirements.

Autor et al.'s (2003) initial study established that nonroutine, cognitive work would be safer than routine, manual work in surviving automation. However, as Frey and Osborne (2017) argue, thanks to Big Data and machine learning techniques, AI systems now tackle nonroutine cognitive tasks, such as language translation, and, with the help of robotics, nonroutine manual tasks, such as driving. AI is increasingly engaged in high-level mental functions such as planning, prediction, and process optimization in accounting and finance, law, and medicine (Roose 2021). Tasks that are nonroutine for humans are converted into routines by chunking them into simpler, algorithm-governed sequences, making "tacit knowledge" explicit. Although machines do things differently than humans, results often turn out comparable or even superior to human outputs. This, then, diminishes the need for workers with special, context-dependent skills (deskilling) obtained through practice and experience (Goldin and Katz 1998, 2009). Converting nonroutine into routine tasks becomes reiterative as better data sets, algorithms, and robots become available. Whereas previous waves of industrialization resulted in tasks being distributed among more, albeit less-skilled, workers, nowadays both skilled and unskilled workers are replaced by AI-empowered machines (Jaimovich and Siu 2019, 2020). Beginning in the 1990s, technological job displacements outnumbered reinstatements, signaling that workers could not cope with the demands of high-skilled jobs (Acemoglu and Restrepo 2019).

Frey and Osborne (2017, 24–28) identify three engineering "bottlenecks" limiting labor substitution: perception and manipulation tasks, creative intelligence tasks, and social intelligence tasks. Let us examine them closely from an anthropological perspective.

### *1.1 Perception and Manipulation*

Unlike AI-empowered robots, humans are great at identifying objects and perceiving essence and individuality, thanks to external (sight, hearing, smell, taste, and touch) and internal (memory and imagination) senses, bodily integrated with reason, volition, and motor appendages (Sison and Redín 2023). These abilities have evolved as humans looked for food, grew, worked, played, and reproduced for biological, social, and symbolic purposes in ever-changing environments.

Advantages in perception and manipulation derive from our condition as embodied animals, equipped with hands that are "the tool of all tools" (Aristotle 1936, 4, 212a14–30). Thus even the best facial recognition systems are no match for babies in recognizing their mothers, and similarly, no robots beat the versatility of human hands. The human body has 244 planes of motion, whereas the typical industrial robot has only 6 (*Economist* 2023).

AI robotic systems cannot identify essences ("appleness"); they only detect certain material, quantifiable, and sensible characteristics (round, red, fifty grams) in *this* particular object, through sensors and manipulators. Although designed to perform fine and complicated movements, they lack versatility; specificity in perception and motion is inversely proportional to scope. Unlike living beings, robots

do not automatically integrate different sensorial and nonsensorial information. Systems trained in sorting apples are useless in sorting bananas; they are designed to function in concrete, well-defined domains. And system rectification (for example, when robots put plastic instead of real apples in a crate) is difficult and costly.

An engineering solution would be to affix barcode stickers, skirting identification problems (Guizzo 2008). But stickers can be badly printed or peel off (Robotics-VO 2013). In perception, machines are no match for humans (Tsang and Almirall 2021). AI and robotic difficulties with perception and manipulation illustrate Moravec's paradox (Stern 2023): owing to a lack of prior knowledge ("ground truth"), computers excel in tasks humans find hard (math) but fail in those even toddlers find easy. Human perception requires more than just tracking objects or data (video and audio) through space and time (Patraucean et al. 2022); it's experiencing the world.

### *1.2 Creative Intelligence*

Creativity can be defined partly as the ability to produce ideas or artifacts (literature, music, paintings, sculptures, plays) that are novel or original (Boden 2003; Frey and Osborne 2017). This is often done by combining ideas or artifacts in ways not previously tried. AI possesses an advantage here, having access to a huge archive with instant recall power. Statistical formulas could generate unique, random combinations. Thus AI produces novel and original artifacts.

However, Boden (1998, 347–48) describes creativity as "a fundamental challenge for AI." AI approaches creativity in three ways: by producing novel combinations ("combinational creativity"), exploring conceptual spaces ("exploratory creativity"), and transforming spaces to generate previously impossible ideas ("transformational creativity"). Computer models work best with exploratory creativity, as it is difficult for them to compete with human associative memory (combinational creativity) and they lack evaluative capacities for transformational creativity. Yet even when AI transforms spaces, results may have no interest or value: think of DALL-E outputs (Stokel-Walker 2022; Leivada et al. 2023) when prompted with "a peanut butter and jelly sandwich in the shape of a Rubik's cube." Such ideas may be novel but not "creative," because they are absurd (Boden 1998). Similar problems occur with automated text generation, which often results in low-quality content (Illia et al. 2023).

Human creativity requires that artifacts "make sense," especially to experts, and express "aesthetic value." AI encounters major obstacles in complying with this. An extrinsic limitation is the lack of agreement regarding "symbolic meaning" or "aesthetic value," such that there can be no definitive training set. But a more important intrinsic limitation is that "symbolic value" and "aesthetic value" are beyond AI's purview. These problems cannot be "specified"; their "success criteria" cannot be objectively quantified or assessed. As a result, no algorithms can be designed (Acemoglu and Autor 2011). In this respect, they are similar to "moral worth" or "moral excellence," which largely escape AI's grasp (Sison and Redín 2023).

Because they lack meaningful creativity, even "intelligent" robots do not have the capacity to innovate (Redín et al. 2023; Botica 2017). At most, AI is an "efficient

method of imitation” (Mitchell 2019, 146), probabilistically identifying patterns better, faster, and cheaper (Agrawal et al. 2018). But innovation requires contextualization and knowledge of existing needs, and AI cannot do this because, among other reasons, it lacks a social dimension.

At the root of human sense making and creativity are embodied reason and free will. “Symbolic meaning” and “aesthetic value” respond to “why” questions; AI systems only respond to “how” queries. That AI is algorithm-dependent shows that it is incapable of free, unfettered, or autonomous volition: it has no inclinations, desires, or preferences (Sison and Redín 2023). Humans, on the other hand, are creative because they determine their own ends (“why”) and autonomously invent ways to reach them (“how”). There is no point in endowing AI with creative intelligence because, having no mind or body, it has no capacity for aesthetic satisfaction.

As in decision-making, AI is best used as a tool in the creative process (Haase and Hanel 2023). AI can augment worker creativity by freeing the worker from codifiable and repetitive tasks (Tsang and Almirall 2021), allowing the worker to attend to more complex problem solving, as in the case of telemarketers (Jia et al. 2023). Digitalization makes *in silico* experimentation or simulation easier and cheaper.

### *1.3 Social Intelligence*

Also called “noncognitive skills” (Kautz et al. 2014; Sánchez-Puerta et al. 2016), social intelligence refers to character traits key to management, such as leadership, persuasion, negotiation or bargaining, collaboration, empathy, and care. As AI does more “thinking” (“calculating” would be more precise), humans can focus on feeling, empathy, and emotions, the lubricants for interpersonal relationships (Rust and Huang 2021). The value of the “feeling economy” is reflected in the pervasiveness of social media in response to people’s desires for connectedness. Increasingly, financial analysts and investment bankers dedicate more time to meeting, encouraging, and reassuring clients, leaving technical matters to AI (Rust and Huang 2021). Inroads have been made in affective computing (Scherer et al. 2010; Picard 2010) and social robotics (Ge 2007; Broekens et al. 2009) such that AI can now mimic some personal responses. But results have been far from satisfactory, even counterproductive, as described by the “uncanny valley” hypothesis (Mori 2012): there is a degree in computer-generated or robotic resemblance to humans that elicits negative responses.

There are intractable difficulties for AI to read the complex gamut of human emotions, and it becomes even more challenging to produce appropriate responses. No matter how sensitive, sensors are often unidimensional; they may capture the voice of customers saying “You’re a very efficient worker” but not the irony in their face. That’s why the “whole brain emulation” approach (Sandberg and Bostrom 2008), focusing exclusively on the mental aspects of emotion, is inadequate. Even if AI were to determine the “genus” of the proper emotional response, for instance, being apologetic, it could not figure out the right “intensity” (Rust and Huang 2021). Furthermore, AI developers tend to assume that emotions are universal (Ekman 2021), that they are expressed or interpreted in the same way. But this is strongly

contested, if not disproven (Crawford 2021, 151ff.), which makes the choice of a training set extremely troublesome. Emotions have a constructed, cultural component that makes their interpretation complex and generalization difficult (Feldman-Barret 2017).

From childhood, humans are trained in recognizing emotions; they can internally mirror what interlocutors are going through. This enables them to decide on the appropriate emotional response and motor reaction. Moreover, embedded in socio-cultural and historical communities, humans are familiar with the symbolic meaning of bodily expressions. Humans are by nature social and relational beings, thanks to which they communicate and share emotions. Unlike AI, humans experience emotions themselves, acquiring a knowledge base impossible to replicate. This allows humans to give authentic, intentional responses to stimuli, not canned or robotic ones, hence the convenience of complementing data science courses with emotional intelligence and collaboration training (Rust and Huang 2021).

So far, we have considered digitally transformed work focusing on features for which humans hold an advantage. But workers also have to compete with other workers, for which it is essential that they possess superior *digital skills* (González et al. 2019). Digital competence refers to “information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking” (González et al. 2019, 29; see also Vuorikari et al. 2016; Carretero et al. 2017).

Digital skills allow workers to get a foot in the door in recruitment and to keep their jobs. However, workers should not be complacent with purely technological skills. Digital competencies are similar to linguistic competencies or expertise in quantitative methods: they are often instrumental. To the extent that these skills are technological, they are more susceptible to obsolescence and automation.

The enduring value of digital skills lies in helping humans make sense of AI systems. Wilson et al. (2017) distinguishes among four such profiles: trainers, who manage data and design algorithms; explainers, who interpret AI outcomes; architects, who organize and adopt AI systems; and ethicists, who set guidelines for accountability. They act as interfaces between AI and society, exemplifying different ways of “tending” to AI, not only “minding” mundane tasks but also “managing” complex ones to amplify human agency (Langlois 2003; Bankins and Formosa 2023).

The organization of digitally transformed work, albeit an external factor, likewise presents specific opportunities and challenges. Organizational culture affects AI deployments just as much as AI deployments affect organizational culture (Ransbotham et al. 2021).

On a macro level, the digitalization of work blurs boundaries between traditional classifications into employees and self-employed, full-time and part-time, permanent and temporary workers (González et al. 2019). Flexibility introduces new work forms (Cherry 2016), some employee oriented (employment sharing, job sharing, casual work, interim management), others self-employed oriented (independent

contractors) mediated by virtual platforms (portfolio work, crowd work, collaborative work), and still others a mix of both (voucher-based work or ICT-based mobile work). Digitalization spells freedom for some, for others insecurity and dependency.

On a micro level, work digitalization has produced the following effects (González et al. 2019, 55; Katz and Krueger 2017; Goldschmidt and Schmieder 2017; Aubert et al. 2006; Bresnahan et al. 2002). First are greater standardization and disintermediation of tasks, while reducing monitoring and supervision (or surveillance) costs, especially for jobs that take place virtually. Examples vary from automated call centers to AI systems that manage welfare benefits, health care, loan applications, and criminal justice decisions (Roose 2021). Although standardization optimizes efficiency, it kills variety and creativity, which are aesthetic and cultural values (Thompson 2022). Second is increased competition, requiring flexibility in human resource management and outsourcing of noncore activities. Third is making online (especially outsourced) work possible through platforms (ridesharing, food delivery). Fourth is increasing worker mobility, enabling work from anywhere, any time, “on demand.” And fifth is empowering self-employed micro-entrepreneurs through e-commerce platforms (Etsy). Digitalization is Janus-faced, enabling efficiency and profits, on one hand, and exclusion and exploitation, on the other. It is up to humans to make morally balanced choices.

These organizational features of work digitalization affect workers differently, according to education and skill levels, with repercussions on earnings. The low skilled may be assigned by platforms to perform routine work in-person in constantly changing locations (think “Net-Cleaners”) for low pay, no security, and high personal safety risks. They may even engage in a “race to the bottom,” driving down fees to compete. Behind the resource-saving and philanthropic rhetoric lie vast opportunities for labor commodification and exploitation (Cherry 2016). The moderately skilled can use platforms to offer products to an enlarged and vetted client pool (for instance, web page designers) while saving overhead expenses. And highly skilled creatives (social media star influencers) can choose or even create their own platforms, delivering custom products at prices they themselves set.

We glean from the preceding a sliding scale in job stability, security or benefits, and earning capacity, depending on skill level. Work digitalization can result in unstable jobs, short-term contracts, and shorter temporary work. It provides loopholes to deny permanent status or benefits to workers, involuntarily stuck in temporary, part-time jobs. Although it increases opportunities for self-employment, worker mobility, and flexibility, it also leads to job fragmentation (deskilling, “dumbing down,” alienation, or lack of meaning), greater competition (lowering wages), and more frequent outsourcing (less commitment or loyalty). To the extent humans suffer depressed skill and knowledge levels (the loss of the ability to store information due to search engine dependence or the “Google effect”; Sparrow et al. 2011; Sutton et al. 2018), their ability to learn and innovate is compromised. Although AI can facilitate employee creativity (Jia et al. 2023), higher-skilled employees take better advantage than lower-skilled ones.

An outcome of work digitalization is more pronounced polarization, not only in income, skills, and work conditions, but also in opportunities for virtue. Technology

is always ambivalent, and digitalization no different, in its capacity to produce opposite results depending on user intention and conditions (Bankins and Formosa 2023). Digitalization has widened the worker divide through relentless and recursive labor substitution. It has created two worker castes: the digitally skilled and the low skilled. Job growth is much faster at these extremes, and when those in the middle are displaced, they adjust down, taking lower-paying jobs and worse conditions.

Even in advanced stages of digital transformation, humans maintain a competitive advantage over technology in tasks that require perception and manipulation, creative intelligence, and social intelligence (Table 1). In competing against other humans, a premium is given to digital skills and competencies, although these tend to be instrumental and transient. The organization of digitally transformed work gives rise to greater flexibility, with ambivalent, highly polarized effects on job stability or security, benefits, and earnings.

Let us now examine the notion of virtuous work.

## 2. VIRTUOUS WORK FROM A NEO-ARISTOTELIAN, CATHOLIC SOCIAL TEACHING, AND MACINTYREAN PERSPECTIVE

For an ethical assessment of virtuous work, we draw on neo-Aristotelian, CST, and MacIntyrean sources. A common trait is that they view work beyond its purely economic significance, a disutility tolerated as a means to income; instead, they consider work a value-laden activity, a direct expression of human agency, and a necessary component of flourishing (Gevorkyan and Clark 2020).

In neo-Aristotelianism, work is any “productive activity” that brings forth (*genesis*) something new. Work (*poiesis*, “making”), inasmuch as it is “heterotelic” (with an end or purpose outside itself), is often contrasted with *praxis* (doing), an activity whose end is its own performance, such as knowing (for its own sake) (Aristotle 1985, 1140b). We work to produce what we need or desire, such as food, clothes, or furniture, and these activities—farming, weaving and tailoring, carpentry—are guided by codifiable rules (algorithms), arts, or techniques (*technai*). Autotelic (self-contained) *praxis*, on the other hand, is governed by virtues (*aretai*) irreducible to rules. Virtues are good moral habits of character. *Poiesis* and *praxis*, along with their corresponding perfections, technique and virtue, respectively, have socio-economic dimensions as well. Originally for Aristotle, work (*poiesis*) is proper to

**Table 1: Human Advantages vis-à-vis Technology in Digitally Transformed Work**

	Human advantage
Perception and manipulation (Frey and Osborne 2017)	Humans can identify essences in individual objects.
Creative intelligence (Frey and Osborne 2017)	Humans possess sense-making capacity.
Social intelligence (Frey and Osborne 2017)	Humans are relational by nature and are able to share and communicate emotions.
Digital skills (Wilson et al. 2017)	Humans can be trainers, explainers, architects, and ethicists.

productive classes (artisans, slaves), whereas theoretical knowledge (*praxis*) like philosophy is proper to the ruling class.

CST diverges from neo-Aristotelianism in affirming work as *opus humanum* or *actus humanus*, a productive activity proper to humans regardless of socioeconomic class. It is a personal act involving the whole human being and expressive of dignity or intrinsic worth; through work, humans imitate their Creator (Gevorkyan and Clark 2020). CST distinguishes two dimensions in work: a subjective aspect, “the activity of the human person as a dynamic being capable of performing a variety of actions that are part of the work process and that correspond to this personal vocation” (Pontifical Council for Justice and Peace [PCJP] 2004, 270), and an objective aspect, “the sum of activities, resources, instruments, and technologies used by men and women to produce things” (PCJP 2004, 270; John Paul II 1981). All work gives rise to two outcomes: one subjective, corresponding to the knowledge, skills, attitudes, virtues, and meanings people develop, and the other objective, the external objects they manufacture. Technology participates in this double dimension, entailing skills and know-how (subjective dimension) and a set of instruments or tools (objective dimension). Technology is neither intrinsically good nor intrinsically evil, something that obliterates human agency, but a potential ally, if properly used, for flourishing (Gevorkyan and Clark 2020). CST ordains that the subjective aspect, inseparable from workers themselves, take normative precedence over the objective aspect (Gaburro and Cressotti 1998).

For CST, it is not enough that work comply with justice; it should satisfy charity as well, according to the logic of gift. Hence “decent work” “expresses the essential dignity of every man and woman in the context of their particular society: work that is freely chosen, effectively associating workers, both men and women, with the development of their community; work that enables the worker to be respected and free from any form of discrimination; work that makes it possible for families to meet their needs and provide schooling for their children, without the children themselves being forced into labor; work that permits the workers to organize themselves freely, and to make their voices heard; work that leaves enough room for rediscovering one’s roots at a personal, familial and spiritual level; work that guarantees those who have retired a decent standard of living” (Benedict XVI 2009, 63). This is, perhaps, the fullest account of “virtuous work,” bringing together the principles of human dignity, common good, universal destination of goods, private property, preferential option for the poor, subsidiarity, participation, and solidarity (Sison et al. 2016).

MacIntyre’s ([1981] 2007, 273) approach to the virtues, including virtuous work, goes through three stages. First, he defines “practices” (socially complex activities with internal goods whose excellence is known only to practitioners and whose goods are objects of cooperation) in contrast to “institutions” (activities or organizations pursuing external goods, such as wealth, status, or power; whose effectiveness can be judged by anyone; and whose goods are objects of competition or rivalry). Examples of practices are the healing and caring professions, whose good is the restoration of health; knowledge of excellence in these tasks requires firsthand involvement, as opposed to opinions of independent observers, and the good sought is an object of cooperation or shared good, such that the whole community benefits

when each member enjoys good health. Because they involve practices, virtues are inescapably “personal,” addressing both individual and relational aspects of agents (Hagendorff 2022). Caring professions, however, need to be “housed” in corresponding “institutions” as hospitals, providing necessary external resources for healing and care. “Institutions” are essential for “practices” to thrive. Yet “practices” and “institutions” are in constant tension. Often, institutional goods take priority, while “practices” are relegated to the back seat. Think of hospitals more concerned with rankings than patient care. Virtuous work for hospital administrators then consists of avoiding seeking institutional goods for their own sakes and ensuring that these are placed at the service of practices.

Next, MacIntyre examines how individual practitioners render compatible various roles, as they live out biographies or life narratives. People cannot be engaged in practices all the time; human beings are called upon besides to participate in a variety of roles (familial, professional, religious, athletic, civic), which often enter into conflict. Many doctors are parents who respond to domestic, apart from hospital, emergencies. Which should they attend to first? There are also tensions among actors: critical care doctors may have different priorities than other specialists. Virtue requires establishing the right priority among conflicting roles, practices, and goods.

Third, the fulfillment of practices ought to contribute to the advancement of communities. Good doctors do not only take good care of patients and are good parents or spouses; they also are innovative and creative, moving the practice of medicine forward with colleagues, through pathbreaking research. Virtuous work pushes practices, individuals navigating multiple roles, and entire communities toward traditions of shared excellence. Virtues are key for individuals embedded in communities to jointly reach flourishing.

Aristotle identified flourishing (*eudaimonia*) as the common good of the political community, on which all other human goods are premised. CST puts forward the common good principle as “the social and community dimension of the moral good” (John Paul II 2004; PCJP 2004, 164) and “the good of all people and of the whole person” (John Paul II 2004; PCJP 2004, 165). MacIntyre (2016) asserts that properly recognizing, engaging, and developing practices is also a common good, first, because it is something we reasonably desire and that perfects us, and second, because it can only be achieved collaboratively.

We rely on others even in procuring our own individual goods. None could become an “independent practical reasoner” without help from committed caregivers. Superior common goods—“the goods of family, of political society, of workplace, of sports teams, orchestras, and theater companies” (MacIntyre 2016, 51–52)—can be achieved only as members of groups. As moral agents, we cannot but act as social and political agents, influencing a common destiny. Business and workplaces are no different, for “the common goods of those at work together are achieved in producing goods and services that contribute to the life of the community and in becoming excellent at producing them” (MacIntyre 2016, 170).

From the preceding, we derive the following conditions for virtuous work (Table 2). First, it ought to be a productive human activity, meant to satisfy human needs and wants, with a view to flourishing. To qualify as work, activities have to

**Table 2: Conceptual Foundations for Virtuous Work from Neo-Aristotelian, CST, and MacIntyrean Perspectives**

	Conceptual foundation
Neo-Aristotelianism	<i>Poiesis</i> (making, heterotelic/productive, techniques) vs. <i>praxis</i> (doing, autotelic/self-referential, virtues).
Catholic social teaching	<i>Actus humanus</i> or <i>opus humanum</i> , subjective dimension/objective dimension, decent work, principles (human dignity, common good, universal destination of goods, private property, preferential option for the poor, subsidiarity, participation, solidarity).
MacIntyre	First, practices and institutions; second, roles and biographies; third, traditions and political communities.

involve the whole human being, an individual rational and social animal, an embodied self-directing agent. CST calls work a “human” or “personal act,” voluntary and rational: it cannot be forced from the outside. Its origin is the actor’s free will, and it is performed through bodily powers, physical and mental. Although work ought to be “productive,” bringing about something new, its purpose is not mere productivity but to contribute to the common good of flourishing. Activities that are unproductive (artistic contemplation) or that produce useless goods and services ought not be called work, strictly speaking. More importantly, not productivity itself but how flourishing can be achieved through productivity should be work’s goal. Otherwise, what would we want productivity for?

Second, work is viewed as a *right and duty*; everyone who can work should, socioeconomic class notwithstanding (John Paul II 1981). Work is necessary for self-development in the many different personal facets (physical, mental, social, and moral), and it channels each individual’s contribution to the political common good (service) (Gutián 2015). Only grave and exceptional reasons arising from health or age exempt people from the duty. Instead of thinking of digitalization as capital substituting labor, perhaps it’s better to frame it as capitalized labor making future work better.

Third, virtuous work demands that we *prioritize the subjective over the objective dimension*, giving greater value to knowledge, skills, attitudes, meanings, and moral habits than external, objective goods, including profits. People matter more than objects; the dignity of work derives from the dignity of workers. MacIntyre reminds us of the primacy of the internal goods of practices, which well-governed institutions ought to support. Otherwise, institutions lose orientation and are corrupted when efficiency or profit is sought for its own sake.

And fourth, every effort must be made to achieve the normative ideal of “*decent work*.” This concept goes beyond what justice demands and enters into the realm of charity (Baviera et al. 2016). Not only does “decent work” acknowledge unique, individual talents; it also acknowledges the complex web of relations individuals inhabit. Individuals ought to be respected in their free work choices and decisions, not subject to unjust discrimination; afforded a chance to contribute and participate in workplace governance; and given opportunities for adequate rest, recreation, and worship. Society should recognize that workers have families to feed and educate and that firms are communities as well. “Decent work” connects very closely with

properly navigating conflicts and the duty to help advance community traditions. As it ensures that no one is left behind, “decent work” aligns with the common good principle.

### 3. HOW DIGITALLY TRANSFORMED WORK CAN BE VIRTUOUS

We now examine how digitally transformed work can meet these criteria (Table 3).

**Table 3: Principles for Virtuous, Digitally Transformed Work, Dos and Don'ts**

Principles for virtuous DTW	Dos	Don'ts
Digital technology is morally neutral.	Moral valence depends on human purpose or intention and circumstances in which technology is used as well as the moral character of agents. Digital technology as a tool or instrument to increase efficiency at the service of flourishing. Collaboration with technology.	Digital technology is an inevitable, natural force. Technological determinism (utopia or dystopia). Digital technology as a tool or instrument to increase efficiency for efficiency's sake. Competition with technology.
DTW can be virtuous so long as it remains a human act that is productive and contributes to flourishing.	DTW should be the product of a free, rational choice. Automate what is dull, dangerous, or dirty. Augment and enhance integral human agency.	Decision or control outsourcing to machines (“machine drift”); treat humans as robots or robot appendages (“algocracy”). Automate as much as possible (“overautomation”). Impoverish human agency through exploitation and alienation (“fauxtimation,” “so-so automation”).
DTW should be supportive of the duty and right of individuals to work, regardless of socioeconomic status and other considerations.	Quality job creation through proper human–computer interaction. Equitable distribution of the fruits of labor: inclusion.	Technology-centric mind-set with humans as an afterthought (“gap fillers”). “Turing trap”: exclusion.
DTW should highlight the subjective dimension of work over the objective dimension.	DTW should focus on distinctive human qualities that are “surprising,” “social,” and “scarce.” Promote the performance of MacIntyrean practices (e.g., digital trainers, explainers, architects, ethicists).	Primacy of objective dimension (technology, efficiency, profits, etc.) over subjective dimension (knowledge, skills, habits, virtues, attitudes, flourishing, etc.) of work. Promote the accumulation of external, institutional goods (wealth, power, fame, etc.).
DTW should be organized in ways that help those whose jobs are unstable, insecure, or poorly paid.	DTW should foster job resilience. Governments, labor organizations, and firms engage in solidarious efforts to achieve the conditions for “decent work.”	Technological unemployment as destiny (for some). Social Darwinism: “to each their own,” “survival of the fittest,” “winner takes all.”

*Note.* DTW = digitally transformed work.

*Digital technology, like all technology, is morally neutral.* It's a mistake to think of digitalization as a natural force, like gravity, against which humans are powerless (Roose 2021). Humans create digital technology, deciding the laws and norms governing use. Technology is never irreversible: humans can agree to strictly limit (nuclear weapons) or stop its use (land mines or asbestos insulation). The same is true with digital technology: we can decide to continue developing autonomous weapon systems, facial recognition, and social robots or not. Technology does not have its own desires or preferences because it is not a living being; objectives are supplied from the outside by humans who use them (heterotelic *poiesis* or “doing”). Technological determinism (Grint and Woolgar 1997), either utopian or dystopian, is an error (Crawford 2021, 213–14). It's not that algorithms know better than humans, in which case we have no choice but to embrace AI as a technological savior and hope it does not wipe us out (Gigerenzer 2022). The value and power of human freedom must be reinstated.

From the statement “technology is morally neutral,” several corollaries can be derived. First, the moral valence of technology depends on intentions and how the technology is used (Brundage et al. 2018): “The machine’s danger to society is not from the machine itself but from what man makes of it” (Norbert Wiener, as cited in Roose 2021, 3). Of course, technology embodies the interests and entrenches the power of designers (den Hond and Moser 2023), yet this imbalance does not per se merit moral censure: think of the technological aids to child-rearing and parenting. Above all, it's a question of the moral character of agents who employ technology.

Second, like all tools and machines, digital technology is a means to make work, physical and mental, easier. Paradoxically, technology does not “work”; it only facilitates work, enabling humans to do new or better things. And third, digital technology raises productivity by multiplying human potential.

Competing against digital technology may prove entertaining, but it may just be a waste of time. Often, technology replicates more clumsily what humans do. Why would we want inferior duplicates? It is through collaboration, not competition, that digital technology reaches its full potential. Even literature on AI in team collaboration or “machines as teammates” (Seeber et al. 2020) has to be taken with a grain of salt for at least two reasons: first, because such a technology does not yet exist—a machine capable of defining a problem, identifying root causes, proposing and evaluating remedies, and conducting after-action reviews is still just hypothetical—and second, because such an imaginary machine is not meant to engage in deliberate goal setting; in truth, it would not go beyond support or assistance. Humans would still control machine artifact design, collaboration design, and institution design.

Humans should leave to technology whatever it can do better, with greater consistency, precision, and speed, and concentrate on tasks requiring flexibility, creativity, and emotional intelligence.

*Digitally transformed work can be virtuous, so long as it remains a human act that is productive and contributes to flourishing.* In general, it makes economic and even moral sense to *automate* whenever possible in repetitive manufacturing (dull) or in

hazardous activities (dangerous and dirty), to *augment* and enhance human agency, saving time, physical effort, and health or liberating creative energies.

To be virtuous, digitally transformed work needs to be rational and voluntary, that is, deliberate. This requires fending off “automation bias” or “machine drift” (Roose 2021), outsourcing decisions to recommender systems due to convenience or frictionless design (one-click), deference (“machines know better”), or laziness. Decision-making ought to remain exclusively a human task, because AI cannot take responsibility or have a moral sense (Roose 2021, 152). To do otherwise, besides falling into anthropomorphization, is morally censurable, relinquishing decisions to tools. AI operates with input data, whereas humans form moral judgments adaptively (Moser et al. 2022). The quantified data on which AI relies act as a moral anesthetic, reducing human problems to technical issues (Heaven 2022). AI can never be truly “responsible” or “mature.” AI can fail due to “limitations in algorithmic models, poorly scoped system goals, or problems with integration with other systems” (Renieris et al. 2022). AI can diminish agency and increase passivity and emotional distance (Friedland 2019).

Humans ought to retain control, instead of passively accepting whatever digital technology dispenses (Lindebaum et al. 2020). We should be wary of the habitual reinforcements of ceding decision-making to AI (Gigerenzer 2022). There is no moral imperative to use AI simply because one can, and certainly not to substitute human judgment (Moser et al. 2022). The efficiency of automation cannot be the sole concern; humans should not be automated (Zuboff 2019) or junked when they fail to keep pace (Crawford 2021). There is also a danger of “overautomating,” giving machines tasks they’re unequipped to handle, such as hiring and firing decisions (Roose 2021, 148) or, worse, decisions over life and death, as with Sarco, the “do-it-yourself” euthanasia machine (Heaven 2022). An egregious example of “overautomating” is when every worker’s movement is tracked, measured, and surveilled to be optimized by AI. Those who meet goals will be rewarded, those who don’t, punished. This is an affront to human dignity. Unsurprisingly, such jobs are characterized by high levels of stress, injury, and illness (Crawford 2021). Algorithmic management is especially unjust because subjects may not even be employees but independent contractors (Mateescu and Nguyen 2019a, 2019b). Smart machines should be working for people, not people for smart machines (Zuboff 2019).

Digitally transformed work cannot be virtuous when it is inhuman, exploitative, and alienating. Exploitation occurs when work is so chopped up and distributed through a network that low-skilled contractors receive only a pittance for microtasks, without job security or bargaining power (Crawford 2021). A digital version of alienation takes place through “fauxtimation” (Crawford 2021) or “so-so automation” (Acemoglu and Restrepo 2019), for instance, self-checkout grocery counters that reduce low-skilled labor by transferring it to customers. Through exploitation and alienation, workers become disconnected with the value and fruits of their labor as well as among themselves (Marx). The objective dimension of their work is separated from its subjective dimension (CST); their existence is withdrawn from their essence (Hegel); they cease to be what they could be, what they ought to

be (Gevorkyan and Clark 2020). They sink into anomie (Durkheim) as deskilled and commoditized resources.

*Digitally transformed work should support the duty and right of individuals to work, regardless of socioeconomic status and other considerations.* Not only public authorities but business owners as well share the responsibility to create jobs. AI need not be a job destroyer; it can change work and create more jobs, taking over some tasks while freeing people to do other, more important and challenging functions (Davenport and Miller 2022). Digital technology can be a potent force for inclusion in the workplace, as in the case of people with disabilities. Systems that transform text to audio (audiobooks and audio navigating systems) are helpful not only for the blind but also for the sighted.

Managers ought to ensure that technology empowers rather than dehumanizes (Roose 2021). They ought to avoid designing jobs in which humans are mere “gap fillers” for tasks soon to be automated (like filling orders in Amazon warehouses, which could very well be done by robots). Although the division of labor increases productivity, it also makes tasks monotonous, destroying creativity and ingenuity, the motors of innovation and progress (Gevorkyan and Clark 2020). To have opportunities for virtuous work, humans have to be able to participate in decision-making and give feedback.

Automation, substituting labor with cheaper AI, tends to be zero sum, with workers losing jobs and business owners reaping all the productivity benefits (what Brynjolfsson [2022] calls the “Turing Trap,” when all gains accrue to capital). Augmentation, by contrast, when AI complements human potential, grows the economic pie, with everyone winning. Amazon’s success, for instance, lies not in replacing workers with robots but in humans interacting with AI innovatively, assisting customers with the widest range of products and delivering them swiftly (Brynjolfsson 2022).

Augmentation implies going beyond understanding machine autonomy and human control as contrary forces. In the human–computer interaction (HCI) model, Shneiderman (2022) proposes that high-level machine autonomy could be compatible with high-level human control. Think of electronic cameras that allow photographers to point and shoot because the software guides and permits them to improve on digital pictures with filters. This is a sociotechnical paradigm whereby humans maintain meaningful control through natural reflexes, keeping responsibility (Holford 2020; Mejia 2023).

*Digitally transformed work should highlight the value of the subjective (perception and manipulation skills, creative intelligence/intellectual virtues, social intelligence/moral virtues, digital skills) over the objective dimension.* Roose (2021) summarizes the most valuable human characteristics in being “surprising, social, and scarce.” “Surprising” means the ability to deal with poorly defined rules, incomplete information, or messy scenarios, like preschool teachers. “Social” refers to the capacity to establish meaningful connections (Mejia 2023), to create positive emotional experiences. “Scarce” signifies developing a unique and diverse skill set, having the versatility of a neurosurgeon, pianist, and mixologist, for example. This translates into leaving “handprints,” like an artist’s signature, in work.

Digitally transformed work ought to include MacIntyrean practices to be virtuous. It must leave room to develop distinctly human knowledge, skills, or attitudes that cannot be achieved outside of such activities and whose excellence could only be perceived by those experienced in the matter.

Take the case of content moderators, reviewers of posts deemed toxic, because they are false and harmful to health, hateful, violent, illegal, or indecent. In 2020, Accenture and its overseas contractors, with almost six thousand workers, billed Facebook approximately \$500 million for these services (Satariano and Isaac 2021). Although 90 percent of noxious posts are filtered by AI, humans still have to deal with the remaining 10 percent in round-the-clock eight-hour shifts all over the world. Besides mental health risks (depression, anxiety, paranoia), reviewers have a very small margin for error: 5 percent of “false calls” could lead to dismissal. This is extremely challenging given shifting standards and the twenty-four-hour limit for removing flagged posts. Hiring practices are not very selective, and the jobs have low pay and inadequate training and support. Given these legal, ethical, and reputational risks, some service providers, such as Cognizant, decided to walk away from contracts worth hundreds of millions—but not Accenture.

As troubling and disgusting as this may seem, reviewing social media posts always involves human judgment, and technology can only be an enabler. That is why people protested when the picture of a nude girl, a victim of napalm bombing in Vietnam, was censored on Facebook (Levin, Wong, and Harding 2016): the intent was not pornographic but to show the horrors of war. Although this may not be anyone’s dream job, it has become necessary due to the ubiquity of social media. Through engagement with the toxic material, moderators may be deemed victims as well. Despite low pay and little training, however, we can imagine that some will martial on, becoming frontline “educators,” “legislators,” and “judges” of what is tolerable or obscene. Their job is not only morally fraught but also organizationally complex (in-house, to maintain control, or outsourced, due to lower costs, lighter regulation, or language and cultural expertise?). A sense of community and social support among fellow workers is necessary to survive (similarly with Mumbai ragpickers, as described by Shepherd et al. [2022]). Among those who began exclusively for the income, perhaps some will remain, having developed a sense of purpose and mission: to protect those even more vulnerable and to set a moral tone for society. It is not far-fetched that these workers in due course rise to supervisory levels and train recruits. They would have achieved “internal goods,” developing decency standards, acquiring moral education, and creating community.

*Digitally transformed work should be organized to help especially those whose jobs are unstable, insecure, or poorly paid.* Paolillo et al. (2022) have devised a “resilience index” (RI) to help the technologically displaced move to better-quality jobs with lower automation risk. For each pair of jobs, RI measures how feasible, in terms of retraining, and how convenient, in terms of Automation Risk Index reduction, is the switch from one to the other. This is useful for managers in technology-induced restructuring to better reposition workers.

Labor organizations can play a huge role (Roose 2021) if they seek the good of members rather than the interests of labor leaders and politicians. In Germany, labor

participation in governance through work councils accounts for greater employee retention with skills upgrading and retraining, without loss of efficiency or global industry leadership (FMEACA 2022). By contrast, US crowd workers are subject to ruthless algocracy and near-complete precarity (Cherry 2016).

CST acknowledges the right of workers to organize (PCJP 2004, 305) (freedom of association) and to contribute to institutional governance. Labor organizations constitute an intermediate layer between individuals and families, on one end, and governments and civil society, on the other. They play an indispensable role in accordance with the principle of subsidiarity (Pius XI 1931): lower-level bodies should be allowed as much self-governance as possible, because they are better aware of local circumstances and stand to benefit or suffer the most. Conversely, higher-level bodies should offer assistance only when lower-level bodies are unable, not smothering initiatives and monopolizing power. Well-functioning labor organizations can act as a defense against abusive governments while uniting and reinforcing legitimate member claims.

An illustration of how even low-end work like data labeling and content moderation need not be exploitative is Sama, a platform-based service provider impacting more than sixty thousand employees and dependents in India, Kenya, and Uganda (Klym 2022; Perrigo 2023; Njanja 2023; Kantrowitz 2023). (Linebaugh and Knutson [2023], however, find Sama labor practices exploitative. Ironically, Meaker [2023] writes about prisoners in Finland doing click work for \$1.67 an hour, just like the Kenyans, yet no one seems to mind, let alone protest.) In 2020, Sama was the first AI firm to obtain B Corp certification for observing high environmental, social, and governance standards, and in 2021, it was ranked among “B Corp’s Best for the World” for workforce commitment. Sama offers long-term job stability, living wages (several times the legal minimum, with fresh recruits often seeing a 360 percent jump), and generous benefits (health care, pension plans, subsidized meals, parental leaves). Although wages of less than \$2 an hour or a net income of \$300 a month may not suffice for a life of luxury, it’s enough to support an individual or even a young family in Kenya (Otieno 2023). To foster workplace participation, it holds floor meetings and more discreet processes when anonymity is desired. Workers receive training in core values, including gender equity: female Sama workers earn 60 percent more on average than women do in other companies. To mitigate health and mental risks, employees have access to wellness programs. They also have opportunities for professional advancement through training in basic digital literacy and the use of tools like Slack and the Google suite. Some entry-level Sama employees have progressed to leadership roles in projects for Fortune 100 firms. Not only does Sama seem to validate and professionalize data-labeling jobs but it also creates opportunities for virtuous “decent work.”

Last, governments also play a key part in promoting benefits and mitigating harms of digitally transformed work through regulation, tax policy, subsidies, labor law, and education (Gevorkyan and Clark 2020). Digital connectivity could be harnessed to create jobs, developing a global labor market while installing safeguards such as certification schemes, digital labor organizing, regulation, and democratic control of online labor platforms (Graham et al. 2019).

#### 4. CONCLUSION

This essay inquires whether digitally transformed work can be virtuous and under what conditions. It eschews technological determinism in both utopian and dystopian versions, opting for the premise of free human agency. This work is distinctive in adopting an actor-centric and explicitly ethical analysis based on neo-Aristotelian, CST, and MacIntyrean teachings on the virtues.

Beginning with an analysis of digital disruption, it identifies the most salient human advantages vis-à-vis technology in digitally transformed work and provides philosophical anthropological explanations for each. It also looks into external, organizational characteristics on both the macro and the micro levels of digitally transformed work, underscoring their ambivalence (efficiency and profits vs. exclusion and exploitation, flexibility and freedom vs. standardization and dependency) and the need to mitigate polarizing effects for the sake of shared flourishing.

The article presents standards for virtuous work according to neo-Aristotelian, CST, and MacIntyrean frames and applies them to digitally transformed work, giving rise to five fundamental principles. These basic guidelines indicate, on one hand, actions to be avoided and, on the other, actions to be pursued, together with their rationales.

At least two avenues for further research may be proposed. Given the mid-level abstraction of conclusions, descriptive, ethnographic case studies of businesses that strive to cultivate the different virtues (courage, moderation, justice, practical wisdom, etc.) in operations in a variety of environments (Holford 2020) can be carried out. Second, investigators may wish to examine how the “human-centered AI” mind-set together with the HCI standards could effectively promote the development of virtues in the digital workplace (Hagendorff 2022; Gorichanaz 2022). Understandably, both will be set against the background idea of the intrinsic human, social, cultural, and moral value of digitally transformed work.

#### REFERENCES

- Acemoglu, Daron, and David Autor. 2011. “Skills, Tasks and Technologies: Implications for Employment and Earnings.” In *Handbook of Labor Economics*, vol. 4, edited by Orley Ashenfelter, 1043–171. Amsterdam: Elsevier.
- Acemoglu, Daron, and Pascual Restrepo. 2018. “The Race between Man and Machine: Implications of Technology for Growth, Factor Shares, and Employment.” *American Economic Review* 108 (6): 1488–542.
- Acemoglu, Daron, and Pascual Restrepo. 2019. “Automation and New Tasks: How Technology Displaces and Reinstates Labor.” *Journal of Economic Perspectives* 33 (2): 3–30.
- Acemoglu, Daron, and Pascual Restrepo. 2020. “Robots and Jobs: Evidence from US Labor Markets.” *Journal of Political Economy* 128 (6): 2188–244.
- Agarwal, Ritu, Guodong (Gordon) Gao, Catherine DesRoches, and Ashish K. Jha. 2010. “Research Commentary: The Digital Transformation of Healthcare: Current Status and the Road Ahead.” *Information Systems Research* 21 (4): 796–809.

- Agrawal, Ajay, Joshua Gans, and Avi Goldfarb. 2018. *Prediction Machines: The Simple Economics of Artificial Intelligence*. Cambridge, MA: Harvard Business Press.
- Alonso, Cristian, Siddharth Kothari, and Sidra Rehman. 2020. "How Artificial Intelligence Could Widen the Gap between Rich and Poor Nations." *IMF Blog*, December 2. <https://www.imf.org/en/Blogs/Articles/2020/12/02/blog-how-artificial-intelligence-could-widen-the-gap-between-rich-and-poor-nations>.
- Aristotle. 1936. *Physics*. Translated, introduced, and commented by William David Ross. Oxford: Clarendon Press.
- Aristotle. 1985. *Nicomachean Ethics*. Translated by Terence Irwin. Indianapolis, IN: Hackett.
- Arntz, Melanie, Terry Gregory, and Ulrich Zierahn. 2016. "The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis." Social, Employment and Migration Working Paper 189, Organisation for Economic Co-operation and Development, Paris.
- Arntz, Melanie, Terry Gregory, and Ulrich Zierahn. 2017. "Revisiting the Risk of Automation." *Economics Letters* 159: 157–60.
- Aubert, Patrice, Eve Caroli, and Mélanie Roger. 2006. "New Technologies, Organisation, and Age: Firm-Level Evidence." *Economic Journal* 116 (509): F73–F93.
- Autor, David H., Frank Levy, and Richard J. Murnane. 2003. "The Skill Content of Recent Technological Change: An Empirical Exploration." *Quarterly Journal of Economics* 118 (4): 1279–333.
- Bankins, Shane, and Paul Formosa. 2023. "The Ethical Implications of Artificial Intelligence (AI) for Meaningful Work." *Journal of Business Ethics* 185: 725–40.
- Baviera, Tomas, William English, and Miguel Guillén. 2016. "The 'Logic of Gift': Inspiring Behavior in Organizations beyond the Limits of Duty and Exchange." *Business Ethics Quarterly* 26 (2): 159–80.
- Benedict XVI. 2009. *Caritas in Veritate*. Vatican City: Libreria Editrice Vaticana.
- Berghaus, Sabine, and Andreas Back. 2016. "Stages in Digital Business Transformation: Results of an Empirical Maturity Study." In *Mediterranean Conference on Information Systems Proceedings*, 22. <https://aisel.aisnet.org/mcis2016/22>.
- Besson, Patrick, and Frantz Rowe. 2012. "Strategizing Information Systems–Enabled Organizational Transformation: A Transdisciplinary Review and New Directions." *Journal of Strategic Information Systems* 21 (2): 103–24.
- Boden, Margaret A. 1998. "Creativity and Artificial Intelligence." *Artificial Intelligence* 103 (1–2): 347–56.
- Boden, Margaret A. 2003. *The Creative Mind: Myths and Mechanisms*. Abingdon, UK: Routledge.
- Botica, Dan Aurelian. 2017. "Artificial Intelligence and the Concept of 'Human Thinking.'" In *Business Ethics and Leadership from an Eastern European, Transdisciplinary Context*, edited by Sorin Vladu, Ioan Fotea, and Adrian Thomas, 87–94. Cham, Switzerland: Springer.
- Bowles, Jeffrey. 2014. "The Computerisation of European Jobs." *Bruegel*, July 24. <https://www.bruegel.org/blog-post/computerisation-european-jobs>.
- Bresnahan, Timothy F., Erik Brynjolfsson, and Lorin M. Hitt. 2002. "Information Technology, Workplace Organization, and the Demand for Skilled Labor: Firm-Level Evidence." *Quarterly Journal of Economics* 117 (1): 339–76.
- Broekens, Joost, Marcel Heerink, and Henk Rosendal. 2009. "Assistive Social Robots in Elderly Care: A Review." *Gerontechnology* 8 (2): 94–103.

- Brundage, Miles, Shahar Avin, Jack Clark, Helen Toner, Peter Eckersley, Ben Garfinkel, Allan Dafoe et al. 2018. *The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation*. <https://maliciousaireport.com/>.
- Brynjolfsson, Erik. 2022. "The Turing Trap: The Promise and Peril of Human-Like Artificial Intelligence." *Daedalus* 151 (2): 272–87.
- Brynjolfsson, Erik, and Andrew McAfee. 2014. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: W. W. Norton.
- Carretero, Stephanie, Riina Vuorikari, and Yves Punie. 2017. *DigComp 2.1: The Digital Competence Framework for Citizens with Eight Proficiency Levels and Examples of Use*. Luxembourg: Publications Office of the European Union.
- Cherry, Miriam A. 2016. "Beyond Misclassification: The Digital Transformation of Work." *Comparative Labor Law and Policy Journal* 37 (3): 577–602.
- Congregation for the Doctrine of the Faith. 1986. *Instruction on Christian Freedom and Liberation Libertatis Conscientia*. Vatican City: Libreria Editrice Vaticana.
- Crawford, Kate. 2021. *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. New Haven, CT: Yale University Press.
- Dahlin, Eric. 2022. "Are Robots Really Stealing Our Jobs? Perception versus Experience." *Socius: Sociological Research for a Dynamic World* 8: 1–2.
- Davenport, Thomas H., and Steven M. Miller. 2022. *Working with AI: Real Stories of Human–Machine Collaboration*. Cambridge, MA: MIT Press.
- den Hond, Frank, and Christine Moser. 2023. "Useful Servant or Dangerous Master? Technology in Business and Society Debates." *Business and Society* 62 (1): 87–116.
- Dries, Nicky, Joost Luyckx, and Philip Rogiers. 2023. "Imagining the (Distant) Future of Work." *Academy of Management Discoveries*. DOI: 10.5465/amd.2022.0130.
- Economist*. 2023. "Machines and Jobs. Where Are All the Robots?" March 11. <https://www.economist.com/business/2023/03/06/dont-fear-an-ai-induced-jobs-apocalypse-just-yet>.
- Ekman, Paul. 2021. "Universal Emotions." <https://www.paulekman.com/universal-emotions/>.
- Elondou, Tyna, Sam Manning, Pamela Mishkin, and Daniel Rock. 2023. "GPTs Are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models." ArXiv. DOI: 10.48550/arXiv.2303.10130.
- Eubanks, Virginia. 2018. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York: St. Martin's Press.
- Eurofound. 2019. *Technology Scenario: Employment Implications of Radical Automation*. Luxembourg: Publications Office of the European Union.
- Federal Ministry for Economic Affairs and Climate Action. 2022. *The Future of Work in the Digital Transformation*. Berlin: Federal Ministry for Economic Affairs and Climate Action. <https://www.bmwk.de/Redaktion/EN/Publikationen/bmwk-ga-the-future-of-work-in-the-digital-transformation.html>.
- Feldman-Barret, Lisa. 2017. *How Emotions Are Made: The Secret Life of the Brain*. New York: Houghton Mifflin Harcourt.
- Felten, Edward W., Manav Raj, and Robert Seamans. 2023. "How Will Language Modelers Like ChatGPT Affect Occupations and Industries?" DOI: 10.2139/ssrn.4375268.
- Frey, Carl Benedict, and Michael A. Osborne. 2017. "The Future of Employment: How Susceptible Are Jobs to Computerization?" *Technological Forecasting and Social Change* 114: 254–80.
- Friedland, Julian. 2019. "Activating Moral Agency by Design: A Model for Ethical AI Development." *MIT Sloan Management Review* 60 (4): 1–14.

- Gaburro, Guiseppa, and Giancarlo Cressotti. 1998. "Work as Such: The Social Teaching of the Church on Human Work." *International Journal of Social Economics* 25 (11/12): 1618–39.
- Gavin, Joanne H., and Richard O. Mason. 2004. "The Virtuous Organization: The Value of Happiness in the Workplace." *Organizational Dynamics* 33 (4): 379–92.
- Ge, Shuzhi Sam. 2007. "Social Robotics: Integrating Advances in Engineering and Computer Science." In *Proceedings of the Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology International Conference*, 9–12. New York: IEEE.
- Gevorkyan, Aleksander V., and Charles Clark. 2020. "Artificial Intelligence and Human Flourishing." *American Journal of Economics and Sociology* 79 (4): 1307–44.
- Gigerenzer, Gerd. 2022. *How to Stay Smart in a Smart World*. Cambridge, MA: MIT Press.
- Goldin, Claudia, and Lawrence F. Katz. 1998. "The Origins of Technology–Skill Complementarity." *Quarterly Journal of Economics* 113 (3): 693–732.
- Goldin, Claudia, and Lawrence F. Katz. 2009. *The Race between Education and Technology*. Cambridge, MA: Harvard University Press.
- Goldschmidt, Deborah, and Johannes F. Schmieder. 2017. "The Rise of Domestic Outsourcing and the Evolution of the German Wage Structure." *Quarterly Journal of Economics* 132 (3): 1165–217.
- González Vázquez, Ignacio, Santo Milasi, Stephanie Carretero Gomez, Joanna Napierala, Nicolas Robledo Böttcher, Koen Jonkers, Xabier Goenaga Beldarrain et al., eds. 2019. *The Changing Nature of Work and Skills in the Digital Age*. Luxembourg: Publications Office of the European Union.
- Gorichanaz, Tim. 2022. "Designing a Future Worth Wanting: Applying Virtue Ethics to HCI." In *Proceedings of the ACM Conference (Conference '17)*. New York: Association for Computing Machinery.
- Graham, Mark, Isis Hjorth, and Vili Lehdonvirta. 2019. "Digital Labor and Development: Impacts of Global Digital Labor Platforms and the Gig Economy on Worker Livelihoods." In *Digital Economies at Global Margins*, edited by Mark Graham, 269–94. Cambridge, MA: MIT Press.
- Gray, Mary L., and Siddarth Suri. 2019. *Ghost Work: How to Stop Silicon Valley from Building a New Underclass*. Boston: Houghton Mifflin Harcourt.
- Grint, Keith, and Steve Woolgar. 1997. *The Machine at Work*. Cambridge: Polity Press.
- Gutián, Gregorio. 2015. "Service as a Bridge between Ethical Principles and Business Practice: A Catholic Social Teaching Perspective." *Journal of Business Ethics* 128 (1): 59–72.
- Guizzo, Erico. 2008. "The Rise of the Machines." *IEEE Spectrum* 45 (12): 88.
- Haase, Jennifer, and Paul H. P. Hanel. 2023. "Artificial Muses: Generative Artificial Intelligence Chatbots Have Risen to Human-Level Creativity." *Journal of Creativity* 33 (3): 100066.
- Hagendorff, Thilo. 2022. "A Virtue-Based Framework to Support Putting AI Ethics into Practice." *Philosophy and Theology* 35: Article 55.
- Heaven, Will Douglas. 2022. "The Messy Morality of Letting AI Make Life-and-Death Decisions." *MIT Technology Review*, October 13. <https://www.technologyreview.com/2022/10/13/1060945/artificial-intelligence-life-death-decisions-hard-choices/>.
- Hess, Thomas, Christian Matt, Alexander Benlian, and Florian Wiesböck. 2016. "Options for Formulating a Digital Transformation Strategy." *MIS Quarterly Executive* 15 (2): 123–39.

- Holford, W. David. 2020. "An Ethical Inquiry of the Effect of Cockpit Automation on the Responsibilities of Airline Pilots: Dissonance or Meaningful Control?" *Journal of Business Ethics* 176: 41–157.
- Illia, Laura, Elanor Colleoni, and Stelios Zyglidopoulos. 2023. "Ethical Implications of Text Generation in the Age of Artificial Intelligence." *Business Ethics, the Environment, and Responsibility* 32 (1): 201–10.
- Jaimovich, Nir, and Henry E. Siu. 2019. "How Automation and Other Forms of IT Affect the Middle Class: Assessing the Estimates." Paper prepared for "Automation and the Middle Class" for the Brookings Institution, Future of the Middle Class Initiative. [https://www.brookings.edu/wp-content/uploads/2019/11/Siu-Jaimovich\\_Automation-and-the-middle-class.pdf](https://www.brookings.edu/wp-content/uploads/2019/11/Siu-Jaimovich_Automation-and-the-middle-class.pdf).
- Jaimovich, Nir, and Henry E. Siu. 2020. "Job Polarization and Jobless Recoveries." *Review of Economics and Statistics* 102 (1): 129–47.
- Jia, Nan, Xueming Luo, Zheng Fang, and Chengcheng Liao. 2023. "When and How Artificial Intelligence Augments Employee Creativity." *Academy of Management Journal*. DOI: 10.5465/amj.2022.0426.
- John Paul II. 1981. *Laborem Exercens*. Vatican City: Librería Editrice Vaticana.
- John Paul II. 2004. *Compendium of the Social Doctrine of the Church*. Vatican City: Librería Editrice Vaticana.
- Kaasinen, Eija, Tiina Kymäläinen, Marketta Niemelä, Thomas Olsson, Minni Kanerva, and Veikko Ikonen. 2012. "A User-centric View of Intelligent Environments: User Expectations, User Experience and User Role in Building Intelligent Environments." *Computers* 2 (1): 1–33.
- Kane, Gerald C., Doug Palmer, G. Anh Nguyen Phillips, David Kiron, and Natashat Buckley. 2015. "Strategy, Not Technology, Drives Digital Transformation." *MIT Sloan Management Review*, July 14. <https://sloanreview.mit.edu/projects/strategy-drives-digital-transformation/>.
- Kantrowitz, Alex. 2023. "The Horrific Content a Kenyan Worker Had to See While Training ChatGPT." *Slate*, May 21. <https://slate.com/technology/2023/05/openai-chatgpt-training-kenya-traumatic.html>.
- Katz, Lauren F., and Alan B. Krueger. 2017. "The Role of Unemployment in the Rise in Alternative Work Arrangements." *American Economic Review* 107 (5): 388–92.
- Kautz, Tim, James J. Heckman, Ron Dirisi, Bas ter Weel, and Lex Borghans. 2014. "Fostering and Measuring Skills Improving Cognitive and Non-cognitive Skills to Promote Lifetime Success." Education Working Paper 110, Organisation for Economic Co-operation and Development, Paris.
- Kim, Tae Wan, and Alan Scheller-Wolf. 2019. "Technological Unemployment, Meaning in Life, Purpose of Business, and the Future of Stakeholders." *Journal of Business Ethics* 160 (2): 319–37.
- Klym, Natalie. 2022. "Responsible Sourcing and the Professionalization of Data Work." Montreal AI Ethics Institute, October 23. <https://montrealethics.ai/responsible-sourcing-and-the-professionalization-of-data-work/>.
- Knieps, Gulnter. 2021. "Digitalization Technologies: The Evolution of Smart Networks." In *A Modern Guide to the Digitization of Infrastructure*, edited by Juan Montero and Matthias Finger, 43–58. Cheltenham, UK: Edward Elgar.
- Korinek, Anton, and Megan Juelfs. 2022. "Preparing for the (Non-existent?) Future of Work." Working Paper 30172, National Bureau of Economic Research, Cambridge, MA.

- Langlois, Richard. 2003. "Cognitive Comparative Advantage and the Organization of Work: Lessons from Herbert Simon's Vision of the Future." *Journal of Economic Psychology* 24 (2): 167–87.
- Leivada, Evelina, Elliot Murphy, and Gary Marcus. 2023. "DALL-E 2 Fails to Reliably Capture Common Syntactic Processes." *Social Sciences and Humanities Open* 8 (1): 100648.
- Levin, Sam, Julia Carrie Wong, and Luke Harding. 2016. "Facebook Backs Down from 'Napalm Girl' Censorship and Reinstates Photo." *The Guardian*, September 9. <https://www.theguardian.com/technology/2016/sep/09/facebook-reinstates-napalm-girl-photo>.
- Lindebaum, Dirk, Mikko Vesa, and Frank den Hond. 2020. "Insights from 'The Machine Stops' to Better Understand Rational Assumptions in Algorithmic Decision Making and Its Implications for Organizations." *Academy of Management Review* 45 (1): 247–63.
- Linebaugh, Kate, and Ryan Knutson. 2023. "The Hidden Workforce That Helped Filter Violence and Abuse Out of ChatGPT." *Wall Street Journal*, July 11. <https://www.wsj.com/podcasts/the-journal/the-hidden-workforce-that-helped-filter-violence-and-abuse-out-of-chatgpt/ffc2427f-bdd8-47b7-9a4b-27e7267cf413>.
- Lordan, Grace, and David Neumark. 2018. "People versus Machines: The Impact of Minimum Wages on Automatable Jobs." *Labour Economics* 52: 40–53.
- MacIntyre, Alasdair. (1981) 2007. *After Virtue*. 3rd ed. London: Duckworth.
- MacIntyre, Alasdair. 1988. *Whose Justice? Which Rationality?* Notre Dame, IN: University of Notre Dame Press.
- MacIntyre, Alasdair. 1990. *Three Rival Versions of Moral Enquiry: Encyclopaedia, Genealogy, and Tradition*. Notre Dame, IN: University of Notre Dame Press.
- MacIntyre, Alasdair. 2016. *Ethics in the Conflicts of Modernity*. Cambridge: Cambridge University Press.
- Marsh, Peter. 2012. *The New Industrial Revolution: Consumers, Globalization and the End of Mass Production*. New Haven, CT: Yale University Press.
- Mateescu, Alexandra, and Aiha Nguyen. 2019a. "Explainer: Algorithmic Management in the Workplace." *Data and Society*, February 6. <https://datasociety.net/library/explainer-algorithmic-management-in-the-workplace>.
- Mateescu, Alexandra, and Aiha Nguyen. 2019b. "Explainer: Workplace Monitoring and Surveillance." *Data and Society*, February 6. <https://datasociety.net/library/explainer-workplace-monitoring-surveillance>.
- Matt, Christian, Thomas Hess, and Alexander Benlian. 2015. "Digital Transformation Strategies." *Business and Information Systems Engineering* 57: 339–43.
- Meaker, Morgan. 2023. "These Prisoners Are Training AI." *WIRED*, September 11. <https://www.wired.com/story/prisoners-training-ai-finland/>.
- Medeiros, Joao. 2023. "The Daring Robot Surgery That Saved a Man's Life." *WIRED*, May 18. <https://www.wired.co.uk/article/proximie-remote-surgery-nhs>.
- Mejia, Santiago. 2023. "The Normative and Cultural Dimension of Work: Technological Unemployment as a Cultural Threat to a Meaningful Life." *Journal of Business Ethics* 185: 847–64.
- Mitchell, Matthew. 2019. "Comment on 'The Impact of Artificial Intelligence on Innovation: An Exploratory Analysis.'" In *The Economics of Artificial Intelligence: An Agenda*, edited by Ajay Agrawal, Joshua Gans, and Avi Goldfarb, 146–48. Cambridge, MA: National Bureau of Economic Research.

- Mokyr, Joel, Chris Vickers, and Nicholas L. Ziebarth. 2015. "The History of Technological Anxiety and the Future of Economic Growth: Is This Time Different?" *Journal of Economic Perspectives* 29 (3): 31–50.
- Mori, Masahiro, Karl F. MacDorman, and Norri Kageki. 2012. "The Uncanny Valley." *IEEE Robotics and Automation* 19 (2): 98–100.
- Moser, Christine, Frank den Hond, and Dirk Lindebaum. 2022. "Morality in the Age of Artificially Intelligent Algorithms." *Academy of Management Learning and Education* 21 (1).
- Muro, Mark, Robert Maxim, and Jacob Withon. 2019. *Automation and Artificial Intelligence: How Machines Are Affecting People and Places*. Washington, DC: Metropolitan Policy Program at Brookings. [https://www.brookings.edu/wp-content/uploads/2019/01/2019.01\\_BrookingsMetro\\_Automation-AI\\_Report\\_Muro-Maxim-Whiton-FINAL-version.pdf](https://www.brookings.edu/wp-content/uploads/2019/01/2019.01_BrookingsMetro_Automation-AI_Report_Muro-Maxim-Whiton-FINAL-version.pdf).
- Nadkarni, Swen, and Reinhard Prügl. 2021. "Digital Transformation: A Review, Synthesis, and Opportunities for Future Research." *Management Review Quarterly* 71 (2): 233–341.
- Nagel, Lisa. 2020. "The Influence of the COVID-19 Pandemic on the Digital Transformation of Work." *International Journal of Sociology and Social Policy* 40 (9/10): 861–75.
- Nardi, Bonnie A., and Yrjö Engeström. 1999. "A Web on the Wind: The Structure of Invisible Work." *Computer Supported Cooperative Work* 8 (1–2): 1–8.
- Nedelkoska, Ljubica, and Glenda Quintini. 2018. "Automation, Skills Use, and Training." Social, Employment and Migration Working Paper 202, Organisation for Economic Co-operation and Development, Paris.
- Njanja, Annie. 2023. "Meta Faces Third Lawsuit in Kenya as Moderators Claim Illegal Sacking, Blacklisting." *TechCrunch*, March 20. <https://techcrunch.com/2023/03/20/meta-faces-third-lawsuit-in-kenya-as-moderators-claim-illegal-sacking-blacklisting/>.
- Otieno, Matthew. 2023. "Is It Wrong to Pay Kenyans US\$2 an Hour to Take Out ChatGPT's Garbage?" *Mercatornet*, February 8. <https://www.mercatornet.com/is-it-wrong-to-pay-kenyans-us2-an-hour-to-take-out-chatgpts-garbage>.
- Paolillo, Antonio, Fabrizio Colella, Nicola Nosengo, Fabrizio Schiano, William Stewart, Davide Zambrano, Isabelle Chappuis, Rafael Lalive, and Dario Floreano. 2022. "How to Compete with Robots by Assessing Job Automation Risks and Resilient Alternatives." *Science Robotics* 7 (65).
- Patraucean, Viorica, Lucas Smaira, Ankush Gupta, Adria Recasens, Yi Yang, Mateusz Malinowski, Carl Doersch et al. 2022. "Measuring Perception in AI Models." *Google Deepmind* (blog), October 12. <https://www.deepmind.com/blog/measuring-perception-in-ai-models>.
- Perrigo, Billy. 2023. "Exclusive: OpenAI Used Kenyan Workers on Less Than \$2 per Hour to Make ChatGPT Less Toxic." *Time*, January 18. <https://time.com/6247678/openai-chatgpt-kenya-workers/>.
- Picard, Rosalind W. 2010. "Affective Computing: From Laughter to IEEE." *IEEE Transactions on Affective Computing* 1 (1): 11–17.
- Pius XI. 1931. *Quadragesimo Anno*. Vatican City: Libreria Editrice Vaticana.
- Pontifical Council for Justice and Peace. 2004. *Compendium of the Social Doctrine of the Church*. Vatican City: Libreria Editrice Vaticana.
- Ransbotham, Sam, François Candelon, David Kiron, Burt LaFountain, and Shervin Khodabandeh. 2021. "The Cultural Benefits of Artificial Intelligence in the Enterprise."

- MIT Sloan Management Review*, November 2. <https://sloanreview.mit.edu/projects/the-cultural-benefits-of-artificial-intelligence-in-the-enterprise/>.
- Redín, Dulce M., Goretti Cabaleiro-Cerviño, Ignacio Rodríguez-Carreño, and German Scalzo. 2023. "Innovation as a Practice: Why Automation Will Not Kill Innovation." *Frontiers in Psychology* 13: 1045508.
- Renieris, Elizabeth, David Kiron, and Steven Mills. 2022. "Mature RAI Programs Can Help Minimize AI System Failures." *MIT Sloan Management Review*, October 4. <https://sloanreview.mit.edu/article/mature-rai-programs-can-help-minimize-ai-system-failures>.
- Robotics-VO. 2013. *A Roadmap for US Robotics: From Internet to Robotics*. 2013 ed. Atlanta: Georgia Institute of Technology. <http://archive2.cra.org/ccc/files/docs/2013-Robotics-Roadmap>.
- Rodríguez-Lluesma, Carlos, Pablo García-Ruiz, and Javier Pinto-Garay. 2021. "The Digital Transformation of Work: A Relational View." *Business Ethics, the Environment, and Responsibility* 30 (1): 157–67.
- Roose, Kevin. 2021. "The Robots Are Coming for Phil in Accounting." *New York Times*, March 6. <https://www.nytimes.com/2021/03/06/business/the-robots-are-coming-for-phil-in-accounting.html>.
- Rust, Roland T., and Ming-Hui Huang. 2021. *The Feeling Economy: How Artificial Intelligence Is Creating the Era of Empathy*. Cham, Switzerland: Palgrave Macmillan.
- Sánchez-Puerta, María Laura, Alexandria Valerio, and Marcela Gutiérrez-Bernalet. 2016. *Taking Stock of Programs to Develop Socioemotional Skills: A Systematic Review of Program Evidence*. Washington, DC: World Bank.
- Sandberg, Anders, and Nick Bostrom. 2008. *Whole Brain Emulation: A Roadmap*. Technical report 2008-3, Future of Humanity Institute, Oxford University, Oxford. <https://www.fhi.ox.ac.uk/brain-emulation-roadmap-report.pdf>.
- Satariano, Adam, and Mark Isaac. 2021. "The Silent Partner Cleaning-Up Facebook for \$500 Million a Year." *New York Times*, August 31. <https://www.nytimes.com/2021/08/31/technology/facebook-accenture-content-moderation.html>.
- Scherer, Klaus R., Tanja Banziger, and Etienne Roesch. 2010. *A Blueprint for Affective Computing: A Sourcebook and Manual*. Oxford: Oxford University Press.
- Schwab, Klaus. 2017. *The Fourth Industrial Revolution*. Sydney: Currency.
- Seeber, Isabella, Eva Bittner, Robert Owen Briggs, Triparna De Vreede, Gert Jan De Vreede, Aaron Elkins, Ronald Maier et al. 2020. "Machines as Teammates: A Research Agenda on AI in Team Collaboration." *Information and Management* 57 (2): 103174.
- Shepherd, Dean A., Sally Maitlis, Vinit Parida, Joakim Wincent, and Thomas B. Lawrence. 2022. "Intersectionality in Intractable Dirty Work: How Mumbai Ragpickers Make Meaning of Their Work and Lives." *Academy of Management Journal* 65 (5): 1680–708.
- Shneiderman, Ben. 2022. *Human-Centered AI*. Oxford: Oxford University Press.
- Sison, Alejo Jose G., Ignacio Ferrero, and Gregorio Guitián. 2016. "Human Dignity and the Dignity of Work: Insights from Catholic Social Teaching." *Business Ethics Quarterly* 26 (4): 503–28.
- Sison, Alejo Jose G., and Dulce María Redín. 2023. "A Neo-Aristotelian Perspective on the Need for Artificial Moral Agents (AMAs)." *AI and Society* 38: 47–65.
- Snow, Nancy E. 2017. "Neo-Aristotelian Virtue Ethics." In *The Oxford Handbook of Virtue*, edited by Nancy E. Snow, 321–42. Oxford: Oxford University Press.

- Sparrow, Betsy, Jenny Liu, and Daniel M. Wegner. 2011. "Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips." *Science* 333 (6043): 776–78.
- Stern, Jacob. 2023. "AI Is Running Circles around Robotics." *The Atlantic*, April 4. <https://www.theatlantic.com/technology/archive/2023/04/ai-robotics-research-engineering/673608/>.
- Stokel-Walker, Chris. 2022. "Meet the Tweeter Curators Highlighting DALL-E's Weirdest AI Art." *Input*, June 16. <https://www.inverse.com/input/culture/dall-e-mini-ai-weird-twitter-images-viral-art>.
- Sutton, Steve G., Vicky Arnold, and Matthew Holt. 2018. "How Much Automation Is Too Much? Keeping the Human Relevant in Knowledge Work." *Journal of Emerging Technologies in Accounting* 15 (2): 15–25.
- Thompson, Derek. 2022. "What Moneyball-for-Everything Has Done to American Culture." *The Atlantic*, October 30. <https://www.theatlantic.com/newsletters/archive/2022/10/sabermetrics-analytics-ruined-baseball-sports-music-film/671924/>.
- Trenerry, Brigid, Samuel Chng, Yang Wang, Zainal Shah Suhaila, Sun Sun Lim, Han Yu Lu, and Peng Ho Oh. 2021. "Preparing Workplaces for Digital Transformation: An Integrative Review and Framework of Multi-level Factors." *Frontiers in Psychology* 12: 620766.
- Tsang, F. Ted, and Esteve Almirall. 2021. "Artificial Intelligence as Augmenting Automation: Implications for Employment." *Academy of Management Perspectives* 35 (4): 642–59.
- Vallor, Shannon. 2016. *Technology and the Virtues: A Philosophical Guide to a Future Worth Wanting*. Oxford: Oxford University Press.
- Venkatesh, Viswanath. 2006. "Where to Go from Here? Thoughts on Future Directions for Research on Individual-Level Technology Adoption with a Focus on Decision Making." *Decision Sciences* 37 (4): 497–518.
- Venkatesh, Viswanath, and Hillo Bala. 2008. "Technology Acceptance Model 3 and a Research Agenda on Interventions." *Decision Sciences* 39 (2): 273–315.
- Verhoef, Peter C., Thijs Broekhuizen, Yakov Bart, Abhi Bhattacharya, John Qi Don, Nicola Fabian, and Michael Haenlein. 2021. "Digital Transformation: A Multidisciplinary Reflection and Research Agenda." *Journal of Business Research* 122: 889–901.
- Vial, Gregory. 2019. "Understanding Digital Transformation: A Review and a Research Agenda." *Journal of Strategic Information Systems* 28 (2): 118–44.
- Vuorikari, Riina, Yves Punie, Stephanie Carretero, and Godelieve Van den Brande. 2016. *DigComp 2.0: The Digital Competence Framework for Citizens. Update Phase 1: The Conceptual Reference Model*. Luxembourg: Publication Office of the European Union.
- Warr, Peter. 2007. *Work, Happiness, and Unhappiness*. Hillsdale, NJ: Erlbaum.
- Wessel, Lauri, Abayomi Baiyeri, Roxana Ologeanu-Taddei, Jonghyuk Cha, and Tina Blegind-Jensen. 2020. "Unpacking the Difference between Digital Transformation and IT-Enabled Organizational Transformation." *Journal of the Association for Information Systems* 22 (1).
- Wilson, H. James, Paul R. Daugherty, and Nicola Morini-Bianzino. 2017. "The Jobs That Artificial Intelligence Will Create." *MIT Sloan Management Review*, March 23. <https://sloanreview.mit.edu/article/will-ai-create-as-many-jobs-as-it-eliminates/>.
- Zuboff, S. 2019. "Surveillance Capitalism and the Challenge of Collective Action." *New Labor Forum* 28 (1): 10–29.

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