Artificial Intelligence and Digital Work: The Sociotechnical Reversal

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Abstract

A well-designed information system (IS) in the classical view comprises two interrelated yet different subsystems; one that represents the technological dimension of work; and one that represents the social dimension. When these subsystems are heralded as equally important, they constitute a sociotechnical whole, producing economic outcomes such as profit and efficiency, plus humanistic outcomes, such as engagement and well-being. We see, increasingly, this classical view becoming obliviated. In this conceptual paper, we reflect upon the role of humans and technology in these changing work environments. While technical aspects from Artificial Intelligence and digital technologies are dominating the social side of work, we suggest a sociotechnical reversal to happen. Whereas this technosocial reality might be well motivated by advances in efficiency and productivity, the effects on well-being and engagement are less well understood. Consequently, we provide a set of theoretically derived principles to guide these changes in the digital workplace.

Keywords: socio-technical principles, digital work, artificial intelligence, technosocial reality, human values

1. Introduction

Since the modern field of Artificial Intelligence (AI) emerged in 1956, AI applications made possible by machine learning (ML) and the use of big data, now include Internet searches, services recommender systems, image and speech recognition, sensor technologies, robotic devices, predictive analytics, and cognitive decision support systems (Howard, 2019). As more AI-applications and digital technologies are integrated into everyday life, AI is predicted to have a globally transformative influence on economic and social structures, and on organizational work. Critical issues of job displacement from automation have been raised (Berente et al., 2021; Howard, 2019), so have concerns around powerful new AI-related phenomena i.e., *datafication* which refers to the quantification of human life through digital information (Mejias & Couldry, 2019) and *Algorithmic Management* (AM) which refers to the delegation of managerial functions to algorithmic and automated systems (Möhlmann et al., 2021). Researchers increasingly report that a disparate focus on efficiency, control, and economic value produces unbalanced outcomes, and consequently prevents human actors from altering their behavior to respond in a pertinent manner (Pasmore et al., 2019). As a result, such transformations are failing to deliver outcomes of both well-being *and* efficiency in digitally transformed workplaces; and as suggested in the sociotechnical change literature (Fischer & Baskerville, 2022; Mumford, 2006; Pasmore et al., 2019; Sarker et al., 2019).

Against this backdrop, our interest is on how the relationship between people and technology are altered, when analyzed as a sociotechnical change. The work below is guided by the following research question: *how are* both *well-being* and *efficiency obtained in digital work that spans AI, Datafication, and AM?*

Following well-established considerations on theory building in IS research (Leidner, 2018) we constructed the paper in the following way. First, we elaborate on tenets and principles in our chosen perspective from the classical view of organizational sociotechnical change. Second, we synthesize the transformative nature of AI, Datafication, and AM from a subset of research literature from the IS field. Third, we analyze how such transformations relate to central sociotechnical tenets and outcomes. We subsequently discuss the ramifications of this new reality and theorize a reversed sociotechnical framework promoting *both* humanistic values and economic outcomes in digital work. We end by suggesting a new set of guiding principles, a normative angle, and future research paths.

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2. Classical View of Sociotechnical Change

There are different views on the relationship between people and technology (DeSanctis & Poole, 1994). The techno-deterministic, the non-deterministic and the integrative view. The first view considers the structure of a technology to be superior to humans, enabling humans to perform certain tasks better. Thus, the introduction of technology means an improvement in productivity, efficiency, and consequently satisfaction of people and organizations. A non-deterministic view implies that technology represents an opportunity for change rather than a causal structure. Studies that follow this view focus more on the social side of task and structures. Such studies are interested in how people structure their institutions and do not assume that technology determines behavior. The third view is the integrative view, referred to as social technology. In this category we find sociotechnical systems theory (Eason, 2008; Mumford, 2006). This view focuses on the interactive relationship between technology and people (Orlikowski & Scott, 2008). It advocates a soft determinism in which the adoption of technology is interpreted as a process of organizational change. More specifically, sociotechnical change refers to organizational change that involves both people and technology. Recognizing both the technology and people dimension is an ideal approach that ensures that systems are highly efficient and contain better human characteristics. These characteristics lead to higher job satisfaction for employees, resulting in a sense of fulfillment, an improved quality of work-life, and exceeded expectations (Mumford, 2006).

Sociotechnical change usually focuses on how a group of individuals interact and adopt a new workplace technology to complete their work-tasks. Designing and enabling information systems in which members are both productive and thriving has been a core focus of sociotechnical change initiatives for decades (Davis et al., 2014; Mumford, 2006). From a philosophical perspective, these processes of change are described as *technological socialization* and *technological institutionalization* (Fischer & Baskerville, 2020, 2022). Technical institutionalization is the process of generalizing value and behavior patterns to the entire system through the innovation of technology. Technological socialization is the process through which this system channels and shapes the behavior of individuals and integrates them into a prevalent culture (Fischer & Baskerville, 2020). In a recent study Fischer and Baskerville (2020) found that leadership's active support of malleable and mobile work-place technology increases individual autonomy to decide where and when to work. They concluded that *technological individualization* was activated in the system, giving members the opportunity to fit work, find meaning, and adjust technology to their preferences and potentials for being productive. These dynamics refer to the tenet of *joint optimization* as the key component when combining the social subsystem and the technical subsystem together to enable new possibilities for work and pave the way for change (Mumford, 2006; Eason, 2008). Due to its mutual causality, the sociotechnical approach has become widely linked with autonomy, completeness, and job satisfaction as both subsystems must work together to achieve a goal (Winter et al., 2014).

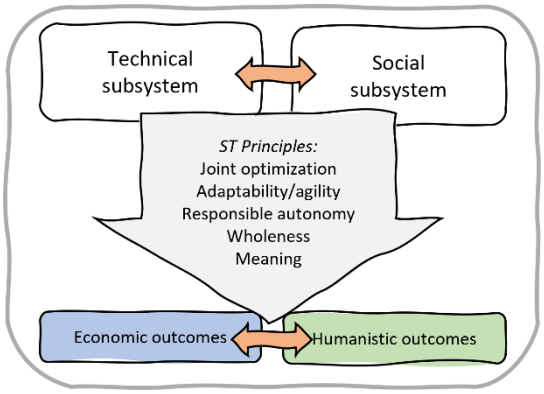

Figure 1. The classical sociotechnical perspective (adapted from Sarker et al., 2019)

In figure 1, we visualize the classical sociotechnical perspective, as constituted of two subsystems, that continuously interact. This is illustrated by the two white boxes on the top, and the two-sided orange arrow. To reach both economic (the blue box) and humanistic outcomes (the orange box) the interaction must be guided by a set of principles (Pasmore et al., 2019; Sarker et al., 2019; Trist & Bamforth, 1951). These principles are listed in the thick grey arrow and read as follows. *Joint optimization* refers to the principle that an individual should be viewed as complementary to the machine rather than as an extension of it (Pasmore et al., 2019). *Adaptability/agility* refers to an environment of increasing complexity, giving groups responsibility for solving local problems. The design of work should aim at increasing variety rather than decreasing it. This means that individual and organizational learning is essential to allow organizational adaptation to change

(Pasmore et al., 2019). *Responsible autonomy* refers to a shift of work to teams or groups, internally supervised, thereby avoiding "silo thinking" by engaging the entire system. *Wholeness* is specifying the objective to be completed, with a minimum of regulation about how it is to be done. The system should be conceived as a set of activities making up a functioning whole, rather than a collection of individual tasks (Pasmore et al., 2019; Trist & Bamforth, 1951). Lastly, *meaning* regards the total significance and dynamic closure that the task must have for everyone. At the level of the individual job each person must experience an optimal level of variety, have learning opportunities, a scope for setting decisions that affect the outcomes of work, organizational support, a job worthy of societal recognition, and the potential for a desirable future (Pasmore et al., 2019). To provide both economic and humanistic outcomes these principles must be included when introducing recent technologies into information systems.

3. AI and Digital Work Phenomena

In this section we review recent and recognized research papers of high-ranked IS publications critically enlightening on the emerging phenomena of AI and its transformational effects on work tasks in contemporary workplaces. In line with the recommendation of Leidner (2018), we selected an exclusive sample to illustrate and synthesize adverse outcomes as a first foundation of our theorizing. First, we discuss the phenomenon of AI in its specifics at the digital workplace, before we consider two recent exemplarily manifestations, namely 'datafication of knowledge work' and 'algorithmic management'.

3.1 AI in the workplace

In an organizational context, AI entails goal-oriented actions that replace or augment human decision making (Berente et al., 2021; Russell, 2019). In comparison to traditional information systems, AI transcends human cognitive functions of learning, reasoning, or self-improvement to a machinery capacity (Rai et al., 2019). Such machine intelligence is dependent on the data it accesses, leading to potential bias, but also to the possibility of outperforming human intelligence by computing more information accurately in less time (Lyytinen et al., 2020). In addition to the machine performance consistency, this accuracy traces back to the machine learning algorithms that increase their predictive power with each exposure to an additional instance. In certain applications these algorithms even have freedom of structural redesign of the entire learning model (e.g., Hofmann et al., 2021). Current business applications cover process automation and suggestions from customer-oriented predictions.

However, the spreading business application of AI in augmenting human decision-making occurs sufficiently to stimulate a rethinking of human-algorithmic interaction in an ambience of hybrid learning scenarios. In such collective settings, solving tasks dependently over time is supposed to outperform separate procedures of machine or human intelligence in isolation (Dellermann et al., 2019). AI can relieve the human worker of the burden of exploring new fields of knowledge, while the algorithm improves its learning performance through human feedback (Sturm et al., 2021). Such close cooperation seems particularly valuable for organizational learning in turbulent market environments, but then it requires all the greater coordination. When building a joint human-AI workforce, the implementation of AI in formerly human dominated knowledge work settings demands a reconsideration of current assumptions on analytic thinking and learning, autonomy, and agency, as well as determinism and transparency (Berente et al. 2021; Larsson and Heintz 2020). This vision of a workplace as a metahuman system suggests courageous anticipation. Such an emerging scheme needs to ensure a conscious engagement with sociotechnical values, when determined by a fluid and even vanishing boundary between the physical (socio) and virtual (technical) hemisphere (Lyytinen et al. 2020; Rai et al. 2019).

3.2 Datafication of knowledge work

Recent technological developments have enabled lots of new ways of 'datafying' our activities in daily work (Mejias & Couldry, 2019). Datafication is the real-time tracking of tacit social qualitative action into codified and quantified data, thus allowing for monitoring, optimization, and predictive analysis (Fischer & Wunderlich, 2021). Correspondingly, knowledge workplace datafication means continuously integrating, analyzing, and visualizing quantifiable aspects of work for the purposes of impacting work activities. According to Mejias and Couldry (2019) datafication is used for economic gains. Datafication is made possible by various digital technologies, such as algorithms, analytics, and AI. The increased usage of digital technologies in work produces a subsequent rise in the amount of data when behavior is now tracked,

recorded, and stored. Leonardi (2021) label these data digital exhaust. Ready to use data means that organizations increasingly use algorithms to code data into categories of action, sort those categories, and perform complex computations that link them together. The consequence is that algorithms are progressively central when turning employees' digital exhaust into data representations (i.e., digital footprints) (Leonardi, 2021). Depending on the context and situation, knowledge workers might be unfairly advantaged or disadvantaged (Leonardi, 2021). Vast amounts of data might improve organizational behavior in many ways, but they also threaten to undermine some of the very systems, processes, and institutions that make workplaces fair and equitable (Leonardi & Treem, 2020). This particular concern is supported by the concept of *invisible cage* which is a consequence of opaque third-party evaluations that limit and select what workers do in a datafied workplace (Rahman, 2021). Consequentially, workers try to align and direct their behavior with the evaluation scores to secure better resources, recognition, or opportunities. This invisible cage is experienced as a form of control in which the criteria for success, and changes to those criteria, are progressively random (Rahman, 2021).

3.3 Algorithmic management (AM)

AM is a term used to describe certain job management practices in the current digital economy. In scholarly uses, the term was initially coined in 2015 to describe the managerial role played by algorithms on the Uber and Lyft platforms (Lee et al., 2015; Rosenblat & Stark, 2016) but has since been taken up by other scholars to describe more generally the managerial and organizational characteristics of platform economies (Stark & Pais, 2021). Recent advances in digital technologies have enabled AM developments, which now allow for the real-time and large-scale collection of data, which are then used to improve learning algorithms that carry out learning and control functions traditionally performed by managers (Möhlmann et al., 2021). Organizations utilizes the vast amounts of data produced, by developing an ecosystem of procedures i.e., rankings, lists and classifications, to effectively manage their operations and create value without the need for traditional forms of management control (Kornberger et al., 2017). The concept of AM now covers the diverse set of technological tools and techniques that structure the conditions of work and remotely manage workforces. AM consists of distinctive characteristics of high-volume data collection and surveillance of workers, real-time responsiveness to data that informs management decisions, automated/semi-automated decision-making, transfer of performance evaluations to rating systems or other metrics, and the use of encouragement or penalties to indirectly incentivize behavior responses from workers. However, as AM creates new employment opportunities, transparency among workers, and fairness to some segments, Ajunwa (2018) reports that critics of AM claim that the practice leads to several impacts, especially on the employment status of workers when managed by a new array of tools and techniques.

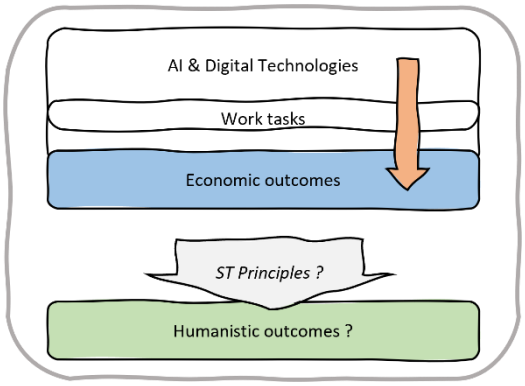

Figure 2. Digital work with AI in a sociotechnical perspective

Summarizing the adverse effects from the increased application of AI and digital technologies at work, in figure 2, we characterize the influence as techno-deterministic illustrated by the orange arrow, as technologies now pre-construct the carrying out of work tasks (illustrated by the amalgamation of the white boxes), hindering the previous equal interaction between the social and technical as illustrated in figure 1. We synthesize economic gains as the major outcome from these changes (the blue box), thereby hindering balanced outcomes (as illustrated in figure 1). An open question asks how humanistic outcomes are obtained, and to what extent S-T principles can be protected (illustrated by the grey arrow and the green box in figure 2). In the next section we elaborate and analyze more in-depth the ramifications of this new reality.

4. The Sociotechnical Reversal

We clearly observe how technologies are moving deeper into the social domain of work. The social and human part of work, such as learning, thinking, reflecting, and acting autonomously, is now

preconstructed by digital technology; it is a datafied environment that frames and constrains how workers react and respond. At the same time, human decision making and management – usually involving skills of leadership, expertise, and experience – is increasingly conditioned by AI and algorithms. Such transformations constitute the ground for a sociotechnical reversal. This new reality might better be labelled as 'technosocial' rather than 'sociotechnical' and therefore proves consistency with the ontological reversal of IS, in which it is argued that digital reality increasingly is created 'first', while the living reality is then constructed (if at all) (Baskerville et al., 2020). In this chapter, we elaborate on the effects of this reversal, assessing additional literature of research on ramifications from AI and digital technologies. To spin our theorizing further (Leidner, 2018), we structure the in-depth analysis by analyzing and addressing consequences on each of the classical sociotechnical principles as presented in section 2. We also value considerations on how IS research may provide increased societal impact by taking a normative angle (Baskerville et al., 2020).

4.1 Joint optimization as a foundation

Following the classical assumptions on ST-change, this reversal affects the overarching principle of *joint optimization* in which the individual should be viewed as complementary to the machine rather than as an extension of it. The initial forays into digital work exhibit little consideration for humanistic outcomes. This oversight will eventually impact the economic outcomes, and we expect future growth in sociotechnical design considerations. We can imagine an ideal impact where both economic and humanistic outcomes become more satisfying. Designers must aim for both in planning digital workplace transformations. Such dual design aims are more important in settings where a digital reality is constructed first, and the living reality is created as a reflection of the digital (Baskerville et al., 2020). For such an ideal, a digital version of reality would not only include affordances for productivity and efficiency, but also for better work-life quality, better safety and security, ethical considerations, etc. This joint optimization of *both* economic and humanistic outcomes lays the foundation for the other four sociotechnical principles.

4.2 Adaptability and agility

In terms of the classical principle of *adaptability and agility*, the digital workplace creates an environment where many more tasks and decisions are taken by or enabled by algorithms. This implies a set of rules to a set of specified tasks, while an ecology of procedures produces data-points on which to act coherently or more narrowly as in the concept of the invisible cage (Rahman, 2021). Knowledge workers thereby adapt while conforming to the technified/datafied environment in which the design of work decreases variety instead of increasing variety. Training people to work with algorithms seems to be the essential point of individual and organizational learning, to allow for adaptation to complexity delivered as data-points on which to respond. However, algorithms represent a form of accuracy, they learn from current information quickly and respond accurately. In this environment multiple dimensions of human data analytics competencies are proven to significantly enhance decision quality (Ghasemaghaei et al., 2018). In addition, automation by AI is supposed to minimize repetitive tasks of the remaining workers to increase their productivity and efficiency, particularly for high-level knowledge work (Holford, 2019). However, in terms of adaptability, it seems as if the datafied environment shifts segments of ongoing adaptability and learning from people to technology, while simultaneously raising confinements on human behavior. These shifts reveal efficiencies with a limited lifespan without better sociotechnical treatments in future system work designs. Current schemes of digital work provide pre-defined avenues, and much less creativity, or transfer learning on the human side (Caron et al., 2022). Algorithms outperform when data is constantly and automatically updated in real-time, when principles of open data even allow for an exponential growth of data cues from digital generativity (Berente et al., 2021; Rydén & El Sawy, 2022). We see that humans adapt reactively to the datafied environment, thereby decreasing task variety and individual and organizational learning, while algorithms on the other hand may "act" more agile by adapting to changing environments through generative, updating data.

4.3 Responsible autonomy

In terms of the classical principle of *responsible autonomy*, digital work shifts to the individual or groups of people carrying out the same specified tasks, informed by data-points or even managed by an algorithm (Leonardi & Treem, 2020). While the technical structures avoid the "silo thinking" by engaging the whole ecosystem of various procedures

(Kornberger et al., 2017), they also create small invisible cages (Rahman, 2021). The implementation of AI interferes with work autonomy by the degree and direction of decision support, drawing on decision support as interactive computer-based systems that integrate diverse elements from database research, decision theory, or economics (Kou et al., 2011). Increased algorithmic agency alters the delegation of authority, hierarchy, and decision rights between the social and the technical (Lyytinen et al., 2020). This indicates that not only the causal direction of decision making could shift from human process supported by machines to humans depicting from machinery suggestions; machinery decisions can become autonomously enacted by granted agency. This implies that entire decisions can become computed by algorithms (e.g., due to their broader capacity of integrating substantial amounts of data), the human element replaced or minimized on legal necessary accountability. Early examples are found in work settings for cancer detection in the health sector from x-ray picture recognition (Walczak & Velanovich, 2018). Consequently, we see that the human privilege of work autonomy becomes altered by the degree and causal direction of algorithmic agency. To the degree that this diminishes the quality of digital work life, efficiency gains are likely to be short-lived until a sociotechnical balance is restored.

4.4 Wholeness

In terms of the classical principle of *wholeness,* changes seem to occur in the span of options people face when specifying the objective to be completed without regulation. Perceiving activities as a functioning whole, rather than a collection of individual jobs, also seems to change.

New objectives in datafication are often discovered rather than planned. One role of data scientists is to find new results by analyzing available data. Driven by cloud architectures and compatibility in databases/data lakes for joint data foundations, such new results sometimes arise from novel data streams and improved analytics methods. Consequently, digital work objectives can be emergent rather than planned. Rather than a functioning whole, activities can arise unexpectedly when new analytic results are suddenly discovered. In addition, algorithms are usually specified for tasks, which indicates the segregation and reconfiguration of human designed workflows in favor of task assemblage, task augmentation, or even task substitution (Rai et al., 2019).

In digital work, tasks may furthermore be created by algorithms rather than the other way round. On the human end, reinforcement learning can be crippled because roles may shift suddenly when new kinds of data analytic results are discovered. This learning can be halted because traditional independent learning processes based on imitating dissimilar roles disappears when the roles become unstable (Li et al., 2019). Moreover, replacing decision making as well as hybrid settings come with certain conditions to succeed. Hybrid learning still requires human domain experts to thrive, which cannot be properly compensated by mere information technology (IT) experts (Sturm et al., 2021). Substitution of human competence by AI can lead to focusing on social interactions with customers when trusting the algorithmic decision (Strich et al., 2021).

To provide wholistic workflows in technosocial environments, the reliance on cloud architecture and compatible databases, e.g., data lakes, has become a crucial precondition. Only the broad and unified access to oceans of data can allow developments of machinery supplementation and recreation of human wholistic thinking. Algorithms' holistic task fulfillment depends on the range of accessible data to be integrated and learnt from to form a whole. While sudden organizational shifts driven by datafication discoveries may bring first-to-market advantages, the advantages may be offset by long term impacts on the social and technical balance (humanistic and economic outcomes). We need to develop a better understanding of sociotechnical management practices for strategic ambidexterity in datafication (i.e., balancing datafication exploration and exploitation).

4.5 Meaning

The classical sociotechnical perspective shows us how a meaningful work life is important for promoting both humanistic and economic outcomes. Care is needed to manage digital work such that the meaning and closure remains strong in a digital work life. The invisible cage from datafication can supplant a worker's autonomy over work outcome, plus diminish the variety in a job and thereby its societal worth. Profit-oriented machinery substitution of human labor bears the risk of losses in reputation and emotional satisfaction (Lyytinen et al., 2020). The algorithmic black box nature of AI can eliminate learning opportunities and

affect the scope of outcomes. For example, the implementation of an algorithm for information-intense credit loan approval led to a loss of reputation and critical thinking in a banking institute (Mayer et al., 2020). Because algorithms can manage more data cues, there might also occur a loss of control and transparency (Möhlmann et al., 2021). Algorithmic management can also diminish worker autonomy, organizational support, social recognition, and create dead end jobs. When the decision is fully forwarded to AI, a loss of human competence, deskilling of specialists, and negative social consequences can be expected (Lyytinen et al., 2020; Mayer et al., 2020). Along with the computational power of algorithms in managing information cues, first empirical evidence already supports a replacement of human tasks, particularly for information-intense tasks (Holford, 2019).

However, these problems assume that managers choose to use technology in a way that privileges economic outcomes over humanistic ones. Given that such a strategy is short-lived, it seems more likely that some form of sociotechnical algorithmic management will evolve that will include objectives for an optimal level of variety, learning opportunities, autonomy, etc. Such a management form can more carefully rebalance the social and technical nature of digital work. Indeed, by incorporating such social and technical work life balance into the digital world of the worker, the physical world would promise more balance than in previous sociotechnical ages. Consequently, in a digital world of work, how to produce meaning from work that increasingly lower variety in knowledge work is a management challenge. It must provide learning opportunities, give a decision-scope that affects the outcomes of work, provide organizational support and training, offer jobs commendable of recognition, and the potential for an attractive future.

5. Discussion and Future Framework

The ontological reversal of digital first suggests a reconsideration of the known duality of the physical world and the digital world, proposing a maxim of primarily virtual creation of reality, human experience, and society in the digital (Baskerville et al., 2020). Where the digital world is created first, and copied into the physical world, there is necessarily a sociotechnical imperative for humanistic outcomes in the digital world. Otherwise, the impact of the digital world on the humanistic outcomes in the physical world becomes accidental at best. A shift of emphasis from sociotechnical to technosocial is only harmful to humanistic outcomes if the digital world, wherever first, ignores such outcomes. We continue suggestions of a reshaping of institutional logics, which indicates to consider the digital first imperative in organizational contexts of knowledge work. Human values, such as respect, acceptance, and empathy, must be(come) an integral element of institutional logics, to convey a positive surge, to reinforce the rationale of moral values. In the current scientific discussion, we find several questions left unanswered, such as how the complementarity of the social and the technical as fundamental convention of sociotechnical systems develops in a digital first world. Given the organizational context of the knowledge workplace (Wunderlich & Fischer, 2022), one discussion centers around decision making in a digital first setting indicating questions such as how decisions are made, on which information basis or experience they are taken, as well as by whom, where, and when. Another discussion centers around how to enable variety, continuous learning opportunities, and meaningfulness.

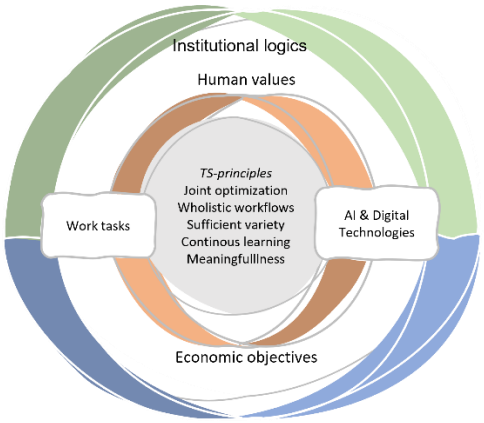

Figure 3. Future framework for AI and Digital Work

We find it imperative to revise and amplify technosocial/sociotechnical principles in a digital first reality. Consequently, we propose figure 3 as a future framework, in which ‘work tasks’ and ‘AI & Digital Technologies’ (the white boxes) are considered as distinct, while nonetheless constituting a wholeness in their ongoing fusion. The promotion of techno-social principles (the grey circle in the middle) is pivotal to obtain well-being and a meaningful work-life, and they recognize the very core of classical socio-technical intentions (Trist & Bamforth 1951; Sarker et al., 2019; Pasmore et al., 2019). Principles from which humanistic outcomes and human values are continuously

considered, to rebalance the IS, no matter how unstable it is (Fischer & Baskerville, 2022). All actors are supposed to guard these principles. We amplify the importance of institutional logics to value both human and economic objectives, illustrated by the changing colors of green and blue in the outer circle (Fischer & Wunderlich, 2021). The principle of *joint optimization* is relevant and foundational in the relationship between humans and technology. However, as the joint interaction and co-learning effects between algorithmic and human instances blur roles of principal and agent, we suggest a dissolution of causal directions in human-machine decision making (Lyytinen et al., 2020). This is illustrated with the orange circular movement, which replaces the horizontal arrow in figure 1 and mitigates the one-sided vertical arrow in figure 2.

Table 1. Suggested TS-principles

Continuous learning. Human learning and experience are foundational to the continued development of the ability to respond pertinently on the individual-human- and the organizational-social level (Leonardi, 2021; Pasmore et al., 2019; Rahman, 2021).
Sufficient variety. As variety is decreasing due to datafication, work is also experienced as increasingly complex due to automation (Wunderlich & Fischer, 2022). Finding a fitting balance between variety to grow competencies and skills, and the straining cognitive consequences of handling work that are not automated is important.
Wholistic workflows. A broad and unified access to oceans of data can allow developments of machinery supplementation and recreation of human wholistic thinking (Fischer & Baskerville, 2022).
Meaningful work. In recognition of classical sociotecnic, work in the digital first reality, must continuously be perceived as meaningful. It must provide a sense of fulfillment and purpose, which will be experienced as well-being (Eason, 2008).

We also suggest a dissolution of whether individuals are complementary to the machine or is an extension of it. In the digital first reality, we must recognize an indistinguishable transcendence between the social and the technical. Latest discussions of evolutions in socio-technical perspectives have already proposed a movement from punctuated equlibria towards an unstable, continously re-balancing evolution of social and technical strucutures, when knowledge professionals use digital technologies to reach outcomes of both a humanistic and economic nature (Fischer & Baskerville, 2022). Such constantly renewing reality from sociotechnical changes might explain underlying tenets of recent concepualizations of how AI and individuals co-evolve at the workplace, which supports a fluid trancendence of the boundaries between the technical and the social (Lyytinen et al., 2020; Rydén & El Sawy, 2022). We observe a need to further explore the alteration of guiding ST-principles. We suggest at least four alterations of principles, to create necessary ripple effects in IS (as illustrated by the rings in figure 3). In table 1, we present these principles and acknowledge a need for future empirical research to verify, elaborate, and justify them.

6. Conclusion and Future Avenues

With this conceptual paper, we provide first theoretical assumptions for a further advancement of the classical sociotechnical perspective. We postulate an apparent technosocial reality. The latest developments in digital technology suppose a current ontological reversal when algorithms claim more agency and fundamentally alter human knowledge work. This technosocial reality comes with certain issues for traditionally considered outcomes of ST systems, such as economic objectives (e.g., efficiency, individual performance) and humanisitc values (e.g., happiness, well-being). We observe an obesity of economic objectives as outcome of the technosocial dominance, whereas human values become misappropriated.

To solve these tensions for human thriving, we suggest a recalibration towards a technosocial perspective that considers an updated set of instituional logics accomodating for the changed technological embeddedness. Inspired by Leidner's thoughts on review and theory building (2018), this paper provides a set of principles to explain current phenomena of integrating AI at the workplace. Also proposing a normative angle on how IS research could shape society (Baskerville et al., 2020), our results may also inspire future guidelines to design digital work settings along the principlies of continuous learning, sufficient variety, wholistic workflows, and meaningful work. We conclude our paper with an imperative for a technosocial perspective that values human ideals and economic objectives for an evolving transcendence of the physical and the digital heimsphere in digital work.

In supporting our assumptions, we anticipate hybrid work settings to continue to transcend current perceived boundaries between social and technical subsystems, motivating a redefinition of rights and

responsibilities as well as change and transformation of the social positions of technosocial identities. Whereas accountability is still supposed to remain a human obligation, algorithms are granted more agency when becoming autonomous actors (Ågerfalk, 2020). The consideration of technosocial identities, alters established assumptions on boundaries and agency of extant information systems and calls for their reconsideration (Lyytinen et al., 2020).

Future research on a technosocial reality may continue and extend our assumptions in further theorization. Our initiated literature-based theory building could ground on a more extensive literature base (Leidner, 2018). Further, the number, quality, and interrelations of our principles could be verified by more illustrative examples, maybe extended by primary data collection in an abductive sense. While modular and configurational settings were intended to explain digital environments (El Sawy et al., 2010; Rai et al., 2019), the apparent discussion of hybrid work arrangements may foreshadow a development towards an amalgamation of social and technical hemispheres. Future examination may therefore consider metaverses as a novel, fused reality of human experience. Metaverses appear particularly interesting as an object of future studies on a sociotechnical reversal since they conceptualize around a range of stimuli that arise indistinctly from a fusion of individual work activities and digital technologies. With this paper, we would like to inspire theorizing such upcoming experiences from a renewed technosocial perspective along human values.

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