Digital Transformation(s): On the Entanglement of Long-Term Processes and Digital Social Change. An Introduction

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Abstract: *»Digitale Transformation(en): Zur Verflechtung von Prozessen der langen Dauer und digitalem sozialen Wandel«.* Digitalisation oscillates between profound promises of transformation and a nebulous buzzword. The analysis of digital transformation processes leaves hardly any (analysis of) social phenomenon untouched. We argue for understanding digitalisation as a complex and heterogeneous process that cannot be rashly reduced to individual principles or uniform transformation effects. Starting from a working definition of digitalisation, we outline the challenges for social sciences research aiming to conceptualize this heterogeneity. We argue for a more differentiated and socio-historically informed analysis not only of processes of disruptive change through digitalisation, but also of continuities, modifications, and reinforcements. In view of the large number of individual case studies and to avoid one-sided generalisations, comparative analyses of different or supposedly similar digitalisation processes are central. Finally, micro-macro analysis opens up important insights into the multifaceted nature of digital transformation(s), especially in terms of breaks, frictions, and enablements of digitalisation through organising and organisations. Understanding digitalisation as a heterogeneous process does not imply multiplying observations of differences but paying attention to the complexity and embeddedness of digitalisation.

Keywords: Digital transformation, digitalisation, social change, comparison, micro-macro analysis, organisation, socio-historical analysis, cultural comparison.

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1. Exploring the Heterogeneities of Digital Transformations – Towards Process-Oriented and Comparative Research Perspectives

There is broad consensus in both academic and public discourse that the omnipresent transformation process subsumed under the term "digitalisation" is one, if not the major, dominant driver of social change in contemporary society. A broad range of disciplinary perspectives and research areas are focusing their interest on digital phenomena and conducting intensive empirical research. However, studies of digital transformation have largely concentrated on *contemporary* manifestations and often focus on carving out the novelty and specifics of *change* in their fields. Accordingly, there has been a relevant neglect with respect to inquiring into the socio-historical conditions in which digital(ized) social change occurs and on the heterogeneous forms, speeds, and depths of associated changes.

In this special issue, we address the challenge of inquiring about the *heterogeneities* of digitalisation. How can we identify temporal patterns of change, continuation, and entanglements characterising digital transformation? What are the decisive antecedents of contemporary manifestations? How can we explore commonalities and differences when taking our first serious look at "digitally induced" changes with different objects of comparison, such as fields, states, or discourse communities? What different social levels and forms, such as organisations and associations, are involved in digital transformation processes and how can we comprehend and articulate a more differentiated understanding of their role in these transformative processes? Accordingly, we understand *digitalisation and the digital transformation*[1] *as a genuinely heterogeneous process* that poses challenges to its exploration and analysis across disciplinary boundaries.

Accordingly, we question the big narrative of an overall disruptive character of the digital transformation or a common encompassing pattern of digitalisation. Exploring digitalisation as a genuinely heterogeneous process does face us with multiplicities. It challenges our research practices, our division of labour in and in between disciplines, and our publication strategies. However, understanding digitalisation as heterogenous does not imply getting lost in these multiplicities, being tied to reconstruct situated practices and different understandings of the digital transformation. Instead, it calls for perspectives that are sensitive for co-constitutive structures and processes that become apparent in empirical research. It still is interested in generalizations,

[1] We use both terms synonymously and operate with an explicitly minimalistic working definition (see section 1).

while at the same time devoting attention to the specific social and sociotechnical embeddings of the phenomena under study.

Process-oriented, socio-historically sensitive, and comparative perspectives on research in the field of digitalisation play a prominent role in contextualizing a digital transformation that at first glance may seem monolithic and homogeneous. In this special issue, we collect interdisciplinary, socio-historical, and comparative perspectives that address these challenges and explore the "structural characteristics" (Elias [1970] 1978, 131) of current digital transformation processes.

However, we see these efforts of exploring and mapping the heterogeneities of digital transformation neither as a scholarly purpose in itself nor as an effort restricted to an emerging new field, such as critical data studies. In contrast, exploring the heterogeneities of digitalisation takes a substantial step toward a more thorough understanding of its antecedents, characteristics, variety, and limits.

1.1 Disentangling Complexities of Change

In current studies on digitalisation, the technologies under analysis are as multifaceted (Gläser et al. 2018) as the socio-technical constellations (Rammert et al. 2016) in which they are embedded and change and by which they are actively shaped. Research projects are evaluating digital change at all levels of social aggregation, such as society (Zuboff 2018; Schultze et al. 2018; Nassehi 2019), the global re-figuration of spaces driven by digitalisation (Bratton 2016; Knoblauch and Löw 2020; Möllers 2017), and organisations (Büchner 2018; Alaimo and Kallinikos 2021). There are also numerous studies on the effects of digitalisation in particular areas of society, such as digital (surveillance) capitalism (Zuboff 2015, 2018; Schiller 2000), working worlds (Henke et al. 2018), digitalised health care, or (technological) assistants (Biniok and Lettkemann 2017). Additional lines of enquiry include the changes wrought upon lifeworlds, daily routines, and practices by digitalisation or the mediatisation of everyday life (Faimau 2018; Hepp 2018). Another focus of interest is clustered around prominent digital technologies, such as studying the potentials and effects of big data (Constantiou and Kallinikos 2015; Diaz-Bone 2019; Baur et al. 2020), the platform economy (Gillespie 2018; Egbert 2018; Kirchner and Matiaske 2020; Alaimo and Kallinikos 2021), or artificial intelligence (Bader and Kaiser 2019; Bechmann and Bowker 2019), all of which are fundamentally transforming ongoing social processes. There is no doubt that the social and economic institutions of contemporary society have been undergoing a fundamental transformation process in recent years.

If we reflect on this profound diagnosis from a process-oriented and socio-historical perspective, the *assumed certainty of the digital transformation's omnipresence and its alleged coherence becomes much less clear*. From a

methodological point of view and with an interest in comparative analysis, the term "transformation" raises questions as to which (pre-)existing structures are transformed and how this occurs. Early in the debate, Brayne (2017, 977) in her influential study of the Los Angeles Police Department, calls into question the narrative of a coherent transformation and instead explores "how the adoption of big data analytics does – and does not – transform police surveillance practices." Such questions help to sharpen the focus on the modus operandi of digital transformations and specify the causal paths along which digital transformation occurs. What is *specific* about social changes referred to as "digital transformation"? What is new about the *modus* of digitally induced social change, for instance in comparison to previous fundamental social epochs, such as the Renaissance or industrialization? From a cultural-historical viewpoint, this also leads directly to the question of what specific qualities are evinced by (extremely heterogeneous) digital technologies, particularly in comparison to earlier technologies with transformative potentials, such as the epoch-making invention of the alphabet, the yoke, the steam engine, or the broad introduction of business analytics in the 1950s. This is where we see the strong potential of process-oriented and cultural comparative perspectives: They allow a socially embedded and contextualised understanding of digital transformation and its socio-historical origins in order to identify and explain the sociogenesis of digital phenomena and their integration into extant processes (see Schützeichel 2004; Bowker 2005; Schwietring 2015).

Both public discourses and many public research funding programmes share the assumption that the potentials and effects of digital innovations are essentially disruptive. In light of these implicit and explicit agendas, results that relativise the "driving force" of digitalisation sometimes encounter resistance to being acknowledged as substantial and original research findings. So, although scholars and societies' interests often evolve around dynamics, radical change, and newness, the role of social continuities and the formative power of other social processes and structures, as well as the specificity of socio-historical contexts, are essential for disentangling the complexities of digital transformations. For instance, studies in prominent fields such as the healthcare sector raise the question of whether effects attributed to digitalisation, such as rationalisation or professionalisation, are actually new, or whether these processes have been unfolding for decades (see Baur et al. 2020; Hergesell, Baur, and Braunisch 2020). Exploring digital transformations or the effects of digital technologies empirically – instead of postulating such a change following common sense assumptions (see Slunecko and Przyborski 2009) – also enhances the identification of continuities under digitalised conditions.

We fully acknowledge that such reconstructive approaches toward recent phenomena are hardly unusual for historians, historical sociologists, and

other process-oriented researchers from the fields of history and cultural studies. They often arrive at an understanding of contemporary society through the reconstruction of its *becoming historically so and not otherwise* (geschichtlichen So-und-nicht-anders-Gewordensein) (Weber [1904] 2002, 103). But this potential has not been widely used, at least apart from some socio-historical research communities. Certainly, there are already some elaborate discussions about utilising well-proven methodological approaches between socio-historical scholars, for example on the methodological consequences of the digital humanities (see Thaller 2012; Brennan 2018) or the effects of digitalisation on the process-oriented analysis of markets (see Krenn 2017) or social inequality (see Sevignani 2017). However, these research strands are often only loosely linked with one another, even though they contain shared methodological questions.

In this special issue on "Digital Transformation(s)," we draw attention to this methodological and comparative potential and bring together interdisciplinary, process-oriented research approaches that illustrate the heterogeneities that inhabit the processes of digital transformation. To narrowly predefine and cluster these heterogeneities in advance would run counter to the goal of this special issue, which is to explore the open and heterogenic "nature" of digitalisation incorporating nuances of change and stability that enfold differently in varying socio-historical and cultural contexts and that initiate societal changes at different levels of societies.

However, we suggest an explicitly *minimalistic working definition*: As with processes of individualisation and globalisation, we understand digitalisation as a complex and heterogenous process leading to increased relevance of digital technology and digital data in contemporary society. Accordingly, we characterise this process as having a direction, connecting it explicitly with the increased relevance of digital technologies and digital data. Although this working definition refers to digital data and digital technologies (e.g., including algorithms, software, and digital infrastructures), it encapsulates our interest in the study of the heterogenic process itself. We draw on the term of "relevance," meaning the social relevance of digital data and digital technologies in various domains of society, instead of their "success." The term "increased relevance" accordingly suggests that failed or shortcoming digital projects, contested algorithmic systems, or poorly functioning digital infrastructures are also included, and thus constitute an essential part of the processes of digitalisation and digital transformation. Accordingly, we understand datafication, "the practice of taking an activity, behavior, or process and turning it into meaningful data" (Leonardi and Treem 2020, 1602) as a central aspect of digitalisation without limiting digitalisation to it.

Without a doubt, there are good reasons for relegating these complexities to the background. One prominent example is Pfeiffer's work, *Digital Capitalism and Distributive Forces* (Pfeiffer 2022). Here, Pfeiffer's main interest does

not lie in exploring the heterogeneities of digitalisation; instead, she suggests that we "look behind the phenomena of digitalization" and ask "whether capitalism itself has any new – or preexisting but intensifying – problems, and whether this helps explain why certain forms of digitalisation and digital business models are particularly successful" (Pfeiffer 2022, 13). Although we agree that the answer to this question poses an essential element of analysing the complexities of digitalisation, we are interested in reversing the relation between background and foreground: We are more interested in understanding the complexities of digital transformation(s) than in delving into what is "behind" processes of digital transformations.

Without doubt, digitalisation and digital transformation have become buzzwords, "a kind of meta tag for how society perceives the reach, direction and depth of the assumed transformation of our time" (Pfeiffer 2022, 7). However, it appears worthy to explore alternative paths to a primarily distancing mode to them and to gain a deeper understanding of the complexities of the process; it should motivate us to find better answers by exploring digital transformations and digitalisation as heterogenous processes. Therefore, we suggest three lines of inquiry: The exploration of temporal patterns in the digital transformation process, the use of (cross-cultural) comparative perspectives, and the exploration of micro, meso, and macro levels of digital transformations. Given the strong emphasis on the novelty of digital transformation phenomena, we suggest a three-dimensional and ideal-typical heuristic that explicitly *includes* the possibility of continuation of processes and structures and their potential imprinting role on processes of change.

These lines of inquiry and the heuristic are meant to raise awareness, especially of the associated methodological challenges in view of the enormous plurality of digital transformations and evolving socio-technical constellations. We want to approach this goal by addressing the *historicity* of digital phenomena, focusing on their socio-historical embedding and development as well as their relation to other (digital) transformations at different times and in different cultural contexts.

By process-oriented perspectives, we do not simply mean the quality of temporality that sequences different events in empirical digitalisation studies. This is indeed a prerequisite for studying digitalisation along the lines proposed in this special issue, but sometimes this is not sufficient. We understand process-oriented research on digital transformation(s) to explicitly include the socio-historical context of the phenomena under investigation, its *becoming historically so and not otherwise*. In other words, a larger time window and closer attention to co-constitutive structures and processes are involved.

2. Between Innovation or Continuation: Exploring Temporal Patterns in Digital Transformation Processes

Although the narrative of radical and disruptive innovation (Schumpeter [1943] 2003) is more suitable for serving the agendas of tech enthusiasts[2] than it is for enhancing our understanding of the digital transformation (Daub 2020), exploring temporal patterns in digital transformation processes presents a challenge. Therefore, it is not surprising that counter movements appear. In this line of thought, Nassehi (2019) rejects the framing of digitalisation as a new process and instead analyses it as a reaction to the increased functional differentiation of society and as such, as a continuation of a well-known process. Accordingly, he postulates that digitalisation sets in already with "the emergence of state social planning, the operationalisation of capitalism, the medical measurement of human beings and the establishment of planning horizons" (Nassehi 2019, 319). Although Pfeiffer's study focuses on capitalism instead of social critique, her analysis of digital capitalism and distributive forces shares Nassehi's line of argumentation to analyse digitalisation as a solution to a higher-level problem, pointing out "capitalism is in the same situation as Nassehi's modernity: much like the latter, which cannot rid itself of the complexity problem through digitalisation, capitalism cannot solve its central problem (always too many goods for never enough markets) through digitalisation. In fact, in both cases the ostensible solution aggravates the respective problem" (2022, 14). Accordingly, digitalisation risks becoming reduced to a solution, forming a "whole bundle of technical, organisational, institutional and social responses" (Pfeiffer 2022, 13). To understand digitalisation as a heterogenous process implies not only turning attention to this bundle but to assume that multiple bundles exist, and to explore their commonalities and patterns and assume that they are not necessarily tied together to answer one overarching problem.

Before scholarly discourses engaged with the term of digital transformation, there already was a vivid discussion of the role of technical visions (Sturken and Thomas 2004) and the turning points in how our relation to the future is shaped by digital infrastructures, for example, in Bowker's (2005) study of the changes of memory regimes in the sciences. Exploring the role of digital databases for biodiversity research, he showed that new memory regimes of science evolve, with which the gathering of data for unforeseeable uses starts to become an end in itself – a change that nowadays has become

[2] For an excellent ethnographic study on the economic and political regime of "entrepreneurial citizenship," see Irani (2019).

unbounded and well known, leading to the diagnosis of a "data imperative" in the field of management studies (Schildt 2020).[3]

However, in light of the proclaimed and actual advancements in artificial intelligence and big data analysis, the value of historical contextualisation seems to take a backseat. So, it comes as no surprise that taking the novelty of these developments as a starting point appears to be a plausible strategy. But over the long term, this strong spotlight on novelty and dynamism when studying processes of digital transformation poses methodological challenges for social science studies of digital transformation (Häußling 2020). One of the major challenges is that the focus of attention is shifted away from the socio-historical context in which digitally induced change is embedded. Under such circumstances, studies of digital transformation may run the risk of resulting in inaccurate conclusions regarding cause-and-effect mechanisms, whereby the "big picture" of the historical roots of social change recedes from view (see Hergesell 2019). The same holds true with research perspectives that endorse the opposite view, by assuming a homogeneous, mere continuation of established processes under digital conditions without consideration for the distinct impact that the massive dissemination of digital technologies and datafication may have upon society and organisations.

Upholding sensitivity to the heterogeneities and thus the complexities of social change that characterise contemporary society remains challenging under these circumstances. As Koselleck (2018) has argued, each generation tends to understand contemporary developments as fundamentally new and is inclined to classify them as unique or specific. This applies in particular to exploring major changes such as digitalisation. This "axiom of uniqueness" (Einmaligkeitsaxiom) can currently also be observed in the state of research on digitalisation and imposes "a specific compulsion to know" (einen spezifischen Erkenntniszwang) (Koselleck 2018, 262; see also Johns 2002). To counter this tendency, we aim to foster a discussion on the benefit of resetting our focus and approach the digital transformation as a highly heterogeneous process. Therefore, process-oriented methodology (see Elias [1983] 2006), as well as comparative and level-sensitive approaches, appear as promising avenues to a more socially embedded, contextualised understanding of digital transformation processes.

Time-sensitive social research has developed significantly more nuanced process models to explore temporal patterns during social change (see Baur 2005, 2015; Baur et al. 2020). In order to grasp the multi-layered patterns of digital innovations, we aim for the empirical exploration of transformation processes. Within the variety of digitalised socio-technical constellations, it is

[3] The phenomenon of the "data imperative" here implies "the pursuit of omniscience – the aspiration of management to capture the world relevant to the company through digital data; and the pursuit of omnipotence – an aspiration of managers to control and optimize activities in real-time and around the world through software" (Schildt 2020, 13).

not surprising that we find just as many diverse patterns of enabled, accompanied, and induced social change wrought by digitalisation. Consequently, we are concerned with the following questions: Which temporal patterns of digitalisation are empirically observable (Otto 2020)? Are long-term transformations or cyclical temporal patterns indeed rarer than disruptive digital change (fractures, turning points) (Hergesell, Maibaum, and Meister 2020)? How do these temporal patterns affect how we understand digitalisation and contextualise existing processes (Pfeiffer 2019)? Which concepts are especially suitable for the analysis of cases in which continuation and change co-occur, for example, around practices of dataveillance (Clarke, Parsell, and Lata 2021)?

Connected to these questions is the issue of digital transformation processes' duration and thus the time period that research of such processes should entail. While historical and cultural studies have already stressed that digitalisation is a process that has been going on for decades (or even centuries), and that popular science is also taking up this perspective (see Burckhardt 2018), current digitalisation research tends to focus on the present or the recent past (see, for example, Bounfour 2016). This leads to the question of whether today's digitalisation(s) can (at least to some extent) in general be understood as an independent development; from the perspective of the longue durée (Braudel 1976), which often observes processes over decades or even centuries, apparent turning points, fractures, or specific developments are relativised as mere short phases within a long-lasting development. Seen in this light, even events that appear to be highly typical for digitalisation from a present-day perspective could turn out to be part of a broader development among others in long-term processes.

Closely linked to this issue is the question of what kind of *specific* social change digital transformations produce, i.e., what form of novelty distinguishes digital transformations from other ongoing "mega-processes," such as rationalisation and globalisation (Alaimo and Kallinikos 2022) or quantification (Mau 2017). To explore these heterogeneities of digitalisation, heuristics are essential and helpful tools (Abbott 2004). In accordance with this concept of a heuristic, we propose *three ideal-typical* (Weber [1904] 2002) *process patterns for analysing processes of digital transformations*. As such, they are much less clear-cut and have fluid boundaries in the empirical data.

The first process pattern in this heuristic is the *actual enabling of novelty* through digital technologies, meaning novelty that would not have been possible without the involvement and affordances of digital technologies and digital data. In this line of inquiry, Alaimo and Kallinikos (2022, 25) point to the content-agnostic, non-neutral, and homogenising character of digital data production. This dimension of analysis highlights the possibility that digital technologies may actually create new kinds of social processes that did not exist before and are difficult to imagine without them. It also includes the

genuinely disruptive innovations currently popular in mainstream research, which radically break (see fractures, Baur 2005; Baur, Braunisch, and Hergesell 2021) with established processes or introduce entirely new ones. Depending on the chosen theoretical perspective, this question of enablement will be answered differently. As Pentzold and Bischof (2019) show in their study on human-robot communication, familiar distinctions such as the separation of active use and passive usability become porous as soon as affordances are understood as collective achievements emerging within the interplay of humans and machines.

We refer to the second form of process pattern as *novelty in continuity or variation*. In these transformation processes, digital technologies and digital data contribute to and shape extant processes by interweaving with them, i.e., by *intensifying* or *weakening* their structural characteristics. Digital technologies and digital data are therefore involved and entangled in these developments, but they do not initiate these processes. Paying attention to this process pattern implies that digital technologies can shape and continue social processes, but without being the essential cause for the emergence of the process, or without being a dominant process pattern. In other words, the involvement of digital data and technologies are more closely attached to established processes and usually take a rather long time to unfold. This widespread type of process pattern is relatively invisible compared to the first, as its effects unfold over a longer period of time (see medium-turn duration, Hergesell, Baur, and Braunisch 2020) and produce less drastic and obvious social change.

Thirdly, processes *of digitalisation can be shaped by existing processes*. This type of process pattern does not create novelty; on the contrary, potential novelty is formed, broken, or even absorbed by already established processes. This process pattern sensitises us to the possibility that processes in some cases do not create novelty in a narrow sense, nor do they shape and vary existing processes; instead, extant ongoing social processes and structures shape digitalisation and digital transformation itself. This third process type can easily be overlooked as "weak" or even "failed" digitalisation, as we pointed out in our minimalist working definition. Indeed, from a process-oriented perspective, this process constitutes a central *aspect* of the phenomenon, and should not be singled out following a success-biased understanding of change. This type of process pattern is well known when, e.g., digital decision-support systems do not change an ongoing organisational process in intended ways, because organisational cultures may support or hinder their use (Ratcliffe, Taylor, and Fisher 2020; Sandhu and Fussey 2021).[4] Another example is specific judicial and political decision premises that narrow down or even restricted the use of specific digital technologies and data, as is the case

[4] However, there is little doubt that the overall increase of the use of decision support systems in many organizations over time makes changes trough digitalisation very likely.

with strong data protection regulations in the European Union or the prohibition against fully automating decisions that involve discretion among public administrative bodies in Germany.[5]

This heuristic of three process patterns may support a differentiated analysis of digital phenomena in their socio-cultural embedding and pose an alternative to premature and homogenic assumptions regarding the novelty and continuation of the digital transformation under study. The heuristic aims to differentiate and historically contextualise the degree and direction of digital transformation for the further research process. As mentioned, these three dimensions of process patterns are ideal-typical classifications (Weber [1904] 2002). However, it is crucial that the composition of selected processes of the digital transformation and questions of novelty or continuation are answered by empirical explorations and not by postulates and is thus open to differentiated findings.

For example, it is an open question how new developments in patient monitoring, such as predictive algorithms, will make a difference in how medical staff make decisions about interventions. For instance, Maiers (2017) shows in her study of a neonatal unit that risk scores for sepsis are not perceived in isolation, but rather in combination with other vital signs and are subject to negotiation. This means that the novelty of the technology does not produce a genuinely new practice, but that, instead, it adds an additional signal into the landscape of potentially relevant patient monitoring cues to which physicians and nurses have to pay attention.

Conversely, this implies that both new and traditional technologies may reappear to be promising research objects for socio-historical digitalisation research. It is possible that both new and institutionalized technologies, such as patient information systems in hospitals, will give rise to new socio-technical arrangements as their functionalities are expanded and as they become increasingly networked with other systems. Hanseth's diagnosis (2007, 1) of the "apparent paradox" also points in this direction: "[i]n spite of all the research on ICT risks and the increased sophistication of the tools and techniques developed, ICT risks still prevail. In fact, there are indications that they are increasing rather than diminishing." In this way, well-known digital technologies may play a key role in causing socio-technically complex new constellations of problems.

3. (Cross-Cultural) Comparative Digitalisation Research

In particular, historical sociology has a long tradition of socio-historical comparative approaches (Law and Mennell 2017) for analysing current social

[5] § 35a Verwaltungsverfahrensgesetz.

change. As a paradigmatic example, Weber ([1920] 1922) employed an historical-comparative perspective in his comparison of world religions to articulate the formation of occidental rationalism in contrast to oriental forms, and thus to formulate his diagnosis of rationalisation. Also well-known are Elias's (Elias and Schröter 1989; Elias [1939] 1997) comparative studies on the different sociogeneses of European nation-states, from whose varying nation-building processes derive cultural and political differences still discernible today. This tradition is extended by prominent studies from the recent past, which also demonstrate the analytical power of historicising comparisons. Abbott (1988) compared the development of professions from the 19th century onward in England, France, and America, and thus elaborated a theoretical "system of profession" and its societal consequences. Another example, which also follows the tradition of Max Weber and highlights the central role of bureaucratic organisation, is Perrow's (2002) study of the emergence of corporate capitalism in the United States, whose specific development paths become apparent through comparison with European structures.

In contrast, current research on digital phenomena is still dominated by individual case studies. There is no doubt that such individual case studies and thematic foci are essential for generating basic knowledge about a phenomenon (Flyvbjerg 2006). In the medium term, the dominance of single-case studies led to the challenge of bringing them into relation with one another to explore the limits and possibilities of empirically informed theory formation as well as generalisation. A comparative perspective is therefore recommended, especially for social science research (see Heintz 2021). For this reason, our special issue brings together contributions that facilitate insights through comparisons at several levels. We focus on three methodological levels: 1) historical-comparative; 2) (cross-)cultural comparative approaches; and 3) comparisons between different (groups of) digital technologies in respective socio-technical constellations (Rammert et al. 2016).

The majority of current studies on digital transformation(s) tend to address the social relevance of digital technologies, thereby identifying a wide variety of socio-technical arrangements as units of analysis, such as platform organisations (Dolata 2019; Kirchner and Schüßler 2019), complex cloud infrastructures (Boes et al. 2017), robots (Bischof 2017; Muhle 2018; Hergesell, Maibaum, and Meister 2020; Maibaum et al. 2022), or assistance systems (Biniok and Lettkeman 2017). Single-case studies in the field often develop their argument on the basis of an example, introducing the selected phenomenon as a specific case in a specific field which is then related to "digitalisation as such." This line of research may establish an impressive series of case studies, but the relationships among them remain unclear: In which respects do digital transformations resemble and differ from one another? This *pars pro toto* approach also makes it difficult to generalise the results of case studies. Thus, on the one hand, concrete practices of digitalisation, so to speak the

modus operandi of digitalisation, are withdrawn from the analytical focus and, on the other hand, comparisons between different digitalisation phenomena become more difficult.

We therefore emphasise the benefits of socio-historical perspective for research on digital transformation and address the absence of an application of historical-comparative methodology. We argue for utilising comparative-historical methodology and are interested in established process-oriented comparison strategies.

The potential of historical-comparative methodologies, paradigmatically illustrated by Tilly's work (and that of others), is certainly useful in addressing the problems in the state of digitalisation research, namely the unlinked number of individual case studies, the insufficient comparability of single studies, and the question of the generalisability of conclusions about digital transformation.[6]

Tilly distinguishes four levels of analysis – the world-historical, the world-systemic, the macrohistorical, and the microhistorical – that make it possible to compare phenomena among each other (Tilly 1984, 61-5). Tilly's system shows methodological differences regarding the research design s of comparisons, as well as the related possibilities of generalization when analysing socio-historical processes and their transformations. Studies on the "world-historical level" focus on clear macro-level phenomena and describe epoch-specific transformations, such as industrialisation. At this level of abstraction, the aim is to generate widely applicable statements with a global scope. Numerous diagnoses of the "digital age" invoke sweeping proclamations of a worldwide digital transformation that permeates all areas of life.

At a still broad yet more limited level of generalisation, Tilly identifies comparisons on a "world-systemic level." This means comparing large-scale processes and their changes between different societies or societal subfields. In the case of digital transformation, this would mean examining the development of digital transformations in societal subsectors such as the health sector, politics, or the economy for similarities and differences.

At Tilly's much more limited "macrohistorical level," individual processes and phenomena are compared with each other. The units of analysis are, for example, processes of change in individual organisations or regions: "Comparisons, then, track down uniformities and variations among these units, these processes, and combinations of the two" (Tilly 1984, 63-4). Applied to process-oriented digitalisation research, this would mean comparing digital

[6] "We must look at [processes] comparatively over substantial blocks of space and time, in order to see whence we have come, where we are going, and what real alternatives to our present condition exist. Systematic comparison of structures and processes will not only place our own situation in perspective, but also help with the identification of causes and effects" (Tilly 1984, 11).

transformation, for instance, in rural and urban areas and analysing the respective peculiarities of the processes.

Tilly's "microhistorical level" assesses social transformations in which the effects of social change in everyday life are prioritised. These "comparisons among relationships and their transformations are no longer huge, but they gain coherence with attachment to relatively big structures and large processes" (Tilly 1984, 64). For historical-comparative digitalisation research, this means, for example, recording everyday digital practices in different areas of life and relating them to the digital transformation of society in general.

To sum up, a more consistent reflection on the levels of analysis of digital transformation's individual phenomena can lead to an adequate comprehension of their socio-cultural context. In socio-historical research, various historical-comparative research strategies are derived from these different levels of analysis, which respectively address different research interests (Spohn 1998; see also Bühl 2003).[7]

We see particular potential for two concrete comparative dimensions, which we consider specifically in this special issue. The first dimension includes explicit consideration of a cross-cultural, socio-historical perspective (see Hergesell 2021). In addition to comparing culturally diverse digitalisation phenomena, the goal is to overcome Anglo-Saxon-centred and Eurocentric research approaches toward digital transformation (Davis and Shinsha 2021). Costa (2018) underlined this when she explored user practices on Facebook and the famous "collapse of contexts" that can by no means be regarded as a concomitant phenomenon of social media. Instead, it has to be reframed as one variety of social practice among others, as revealed by her findings of complex practices meant to keep social contexts separate from each other when using social media in other cultural regions. Only by making the effort of comparing practices can we correct assumptions about effects that appear to be a general feature of certain technologies or "the" digital transformation. It also appears that the Global South requires much less socio-technical infrastructure than developed countries to trigger extensive digital transformations, as Faimau (2018) shows with his analysis of the emergence of new religious practices. Comparative perspectives do not only sensitise us to breaks and differences, but also for the travels of models across contexts such as the transmission of contagion models between the domains of public health and public safety (Heimstädt, Egbert, and Esposito 2021). For our special issue we have explicitly collected contributions that address digitalisation phenomena in different (cross-)cultural contexts and allow a comparison between them.

[7] Tilly's (1984) work on this subject also includes a systematisation of historical-comparative research designs that can strengthen comparative digitalisation research. The research strategies he proposed differ in the amount of selected and compared cases (one to all) and the considered dimensions of analysis (single to multiple).

The second dimension of comparison results from scepticism about the limitations of digitalisation research clustered around a few prominent digital technologies. Due to funding stimuli and the multidisciplinary research field, research on digitalisation currently groups around specific technology groups such as artificial intelligence, assistant technologies, database infrastructures, VR, and self-tracking technologies, and less around different socio-technical constellations (Rammert et al. 2016). A specific reference to technology is undoubtedly crucial in considering the heterogeneity of digital technologies, in enabling a comparison between them, and in avoiding a one-size-fits-all fiction of digitalisation. However, the orientation toward technology clusters increases the challenge of consistently taking as their starting point their social embedding, or even more so, the making of their social context and their social development. Furthermore, the clustering of technologies like that of "assistance and support technologies" also deeply influence our societal conceptions of human-machine interaction (Karafillidis 2019). We therefore argue that studies exploring the heterogeneities of digital transformation can profit from a more critical inquiry into the clustering of their phenomena: When are which clustering terms used and what interests do they serve? When do shared terminological clusters suggest similar socio-technical constellations? When is this suggestion accurate and when does it appear to be misleading?

4. Micro, Meso, and Macro Levels of Social Change in the Digital Transformation

Process-oriented digitalisation research explores all levels of social aggregation and is particularly interested in comprehending digitalisation through the interrelationships between micro, meso, and macro levels. To deepen analyses of digitalisation differentiating and relating these levels poses a crucial step in exploring its heterogeneity. In historical-comparative research, there is a long tradition of process-method(olog)ical thinking about how different levels of social aggregation in change processes are entangled and can be analytically related (Baur et al. 2019; Baur, Braunisch, and Hergesell 2021). This potential of social and cultural studies methodology and social theory concepts should also be applied to research on digitalisation. How do the daily effects of societal change processes show up in the lifeworlds of actors? And how – in terms of the duality of structure (Giddens 1984; König 2013) – do temporally and spatially limited actions affect the infrastructures of digitalisation? What does the "media society" mean for everyday interactions and specific practices? How do organisations shape processes of digitalisation

and how are they in turn influenced and modified by digital transformation processes?

Different socio-historical perspectives and process-oriented approaches are available to address these questions. For example, Kalberg (1994, 3-9) systematised historical-comparative schools concerning their methodological procedure and their (social) theoretical assumptions. Advocates of world systems theory assume that, on the macro level, "laws of the world system" (Kalberg 1994, 5) exist which are shaping change processes and can be found globally in all areas of societies. The methodological consequence of this perspective is that world systems theory's studies are based on variables with a high number of cases trying to design a generalisable world system model. Kalberg (1994) contrasted this with the interpretive-historical school, whose scholars attempt to understand social change through the concentrated historical reconstruction of one or a few cases, usually at the micro-level. These reconstructed cases are then compared with a few cases, likewise extensively subjected to hermeneutical analysis, to work out typical patterns of all-encompassing transformation processes.

Scholarly attention was long devoted to digitalisation's macro and micro levels. Exploring the interwovenness of politics, discourses, and technologies on the one hand and analysing practices on the ground, on an individual level, on the other hand, brought together scholars from a variety of disciplinary backgrounds to explore change induced around and through digital technologies.

On the macro level, the focus on politics was prominently set by Eubanks's work (2018) on the "digital poorhouse," discussing the paradigmatical shift in governing the poor in the United States by a system of databases, algorithmic technologies, and risk models. Zuboff's (2018, 24) diagnosis of new surveillance capitalism also explicitly crossed the boundaries of companies and technologies when reconstructing the logic of surveillance capitalism. From the range of societal fields, the fields of public governance, policing, and security research (Kitchin 2014; Egbert and Leese 2020; Jarke and Breiter 2020; Brayne 2021) were among the most intensely studied ones. Here, mainly ethnographical approaches, such as Brayne's study of the big data practices of the Los Angeles Police Department, explicitly started from the speculative assumption that changes were induced by digital technology, analysing actual use in practice and their consequences instead with an "on-the-ground account" (Brayne 2021, 4). Particularly in light of the discursive normality of overpromising technologies, these qualitative, in-depth, often ethnographical inquiries (e.g., Christin 2017, 2020) became a key way to explore the heterogeneities of the digital transformation along different axes: the axes of expectation versus on-the-ground practices, intended versus non-intended consequences, and ostensibly coherent versus often heterogeneous changes of practices.

Critical early scholarship pointed to the discursive powers in play for understanding the dynamics of the spread and influence of digital technologies and data. In their definition of big data, Boyd and Crawford (2012, 663) emphasised that not only technology and analysis, but the myth of big data – which asserts "a higher form of intelligence and knowledge that can generate insights that were previously impossible, with the aura of truth, objectivity, and accuracy" – constitutes what is being perceived as big data.

Similar to the well-known discourses on innovation, digital technologies are often connoted in a persuasively positive sense or appear as universal solution strategies (Godin 2008, 2015; Morozov 2014; Braunisch, Hergesell, and Minnetian 2018). To some extent, innovative digital technologies or "digitization" are even positioned as imperatives (Windeler 2016), irrespective of their practical and empirically observable effects. Social imaginaries inform discourses in a profound way (Jasanoff and Kim 2009; Jasanoff 2015), yet these discourses are also formed strategically. Following this strand of analysis, Gillespie (2010, 348), following Wyatt (2004), pointed out early that the discursive work behind the popular term "platform" allowed companies to "strike a regulatory sweet spot between legislative protections that benefit them and obligations that do not, and to lay out a cultural imaginary within which their service makes sense."

The discursive tailoring of problems to gain support and legitimacy for technical solutions also played a crucial role in strategic political turning points, such as those marked by the EU General Data Protection Regulation. Before it went into effect in 2018, alliances of biobanks and health-related research institutions successfully shifting the discourse from the protection of data to the protection of health, thus paving the way to data reuse as envisioned by big data science (Starkbaum and Felt 2019). How a discursive "fit" between politically contoured problems and the promises of digital innovation is achieved was also illustrated impressively by Egbert's (2018) study on predictive policing. In Germany, the introduction of predictive policing relied heavily on the idea that a specific crime – domestic burglary – was successfully contoured as a problem that could be fixed by predictive policing. Insights into the heterogeneities of digitalisation processes can also be gained by analysing less "successful" discursive alliances. Analysing the case of the personal health record (PHR) in the United States, Davidson, Osterlund, and Flaherty carved out the different careers of visions and their competition within an innovation community to understand why "the lofty legitimating claims for the PHR innovation remain largely unfulfilled" (2015, 210). Finally, the prominent role of discourses also imprints societies' struggles to deal with the negative side effects of digital transformation. Reflecting critically about the limits of fairness, Hoffman pointed to the inherent problems of the "liberal discourses of rights, due process, and antidiscrimination" in the US, showing how its limitations obscure the structural reasons that produce and

intensify disadvantages before they become visible as issues of digital discrimination (2019, 901).

In light of this strong focus on the macro and micro level, *exploring the meso-level of digitalisation*, and its relation to the macro and micro level, is both a considerable challenge and an urgent prerequisite for untangling the heterogeneities of the digital transformation. Aside from the role of networks, it is the *role of organisations* in understanding digital transformation processes that becomes increasingly acknowledged at the meso-level (Büchner 2018; Husted and Plesner 2020; Büchner, Dosdall, and Constantiou 2023; Tacke and Kette 2022). Different research strands share this interest in the dynamics and characteristics of organised action. Regarding the understanding of sociotechnical imaginaries, a major adjustment was made by Jasanoff in opening up the definition from a focus on national states towards "other organised groups, such as corporations, social movements, and professional societies" (2015, 4). We just begin to understand the complexities of imaginaries, especially when opening our focus to the additional logics in play. In this line of thought, Horgan's (2022) ethnographic study of data-driven-governance in Los Angeles showed that on the level of daily data practices, administrations were less engaged in building a better future, but more in preventing unwanted ones, leading to a coupling of prevention logics and predictive analytics. Together with reflections upon the relation between singularised visions and institutionalised imaginaries, as well as the contested character of imaginaries, these adaptations support a more nuanced and multifaceted understanding of the role of imaginaries in our contemporary society (Mager and Katzenbach 2021).

When digitalisation is studied, organisations are, on the one hand, omnipresent as sites where the use of technologies can be studied, as workplaces where innovations become integrated as companies engage in digital business models. At the same time, dealing with the meso-level of organisation often appears difficult because of the challenge of grasping them conceptually as specific social forms with their own logics and structures. In light of a history in which even organisational theory strongly turned its focus towards work instead of organisation (Barley and Kunda 2001) and to processual understandings of organisations, this challenge does not come as a surprise (Besio, Du Gay, and Serrano Velarde 2020). Accordingly, ethnographic research discusses organisations, aside from networks and collectives, as "field sites under study" where, following Callon's sociology of translation (1986), algorithms become enrolled (Christin 2020, 911). On closer inspection, the study of the role of organisations in digitalisation is challenging because organisations act at the same time as entities that are massively shaped and changed by the digital transformation, forcing them to invent new business models, to question their processes of decision making, or to engage differently with their environments. At the same time, organisations are not dissolving as a

specific social form, be it as formalised social systems with formal and informal expectation structures (Luhmann 1999), or as more or less partial organisations, as "a decided order, including one or more of the elements of membership, hierarchy, rules, monitoring and sanctions" (Ahrne and Brunsson 2011, 84). This constitutes an *ambiguous character of organisations* in the digital transformation in a twofold way. First, it includes change *and* stability as a social form (e.g., social system, partial organisation, or otherwise), and second, in relation to the digital transformation, their capacity to actively shape the heterogeneous digital transformation process *and* be changed and challenged by it. Organisations constitute not only passive contexts where digitalisation takes place, but also *active frames* for digital transformation (Büchner 2018). Because organisations form complex social forms, their influence on digital transformation is *multifaceted*, not one-dimensional (Kallinikos and Hasselbladh 2009; Kallinikos 2010; Plesner and Husted 2020). This ambiguous character of organisations feeds several conceptual challenges in studying digitalisation that can be sketched out.

Discussion has centred prominently on the challenge of *characterising (supposedly) new phenomena like digital platforms* and relating them to existing concepts like that of organisations, corporations, and markets (Baldwin and Woodard 2009; Kirchner and Schüßler 2019; Ametowobla 2020; Kretschmer et al. 2022). Attempts to pin down the identities of platforms are also demanding because organisations such as TripAdvisor mutate and change, starting as a search engine, developing into a social media platform, and finally transforming into an end-to-end service ecosystem (Alaimo, Kallinikos, and Valderrama 2020). Recent studies on a digital labour platform (Poshmark) pointed to the risky dynamic set in motion by a rapid scaling of the platform, observing the need for the sellers to perform increased clickwork and digital engagement. This exhausting hustling may pose not only a threat to the micro entrepreneurs, selling on the platform, but also to the resilience of the ecology of the platform. In this line of research, recent work has also questioned the perspective on digital platforms as expressions of a new organisational form and carved out the essential role of precursors[8] as bridges to platform capitalism (Steinberg 2022).

Another challenge lies in how organisational changes are analysed on a general level in respect to "the digital" in digital data and digital technology. Scholarly interests tend to either follow a research agenda devoted to "the diversity of everyday experiences with data and datafication in and around organisations" (Saifer and Dacin 2021, 10). In this strand of research, digital data is understood as "a site of debate, contestation, and negotiation" (Saifer and Dacin 2021, 11), underlining the importance of the variety of discursive and

[8] Steinberg traces today's platform capitalism and carves out continuities not in the popular relation to computers, but to cars, showing "the automobile lineage of platform capitalism," especially to Toyotism (Steinberg 2022, 1085).

emotional engagements with data. Generalised conclusions on the direction of change tend to be viewed critically. In contrast, other approaches devote more attention to the specifics of digital data and technology in studying changes for organisations. This is the case when, for example, the making of data commodities and data objects is studied, enabling programmatic advertising and music platforms (Alaimo 2021; Alaimo and Kallinikos 2021). In this strand, the specifics of the digital make a crucial difference and suggest a generalisable thesis on what is changing for organisations as social entities in the digital transformation; organisations become, following Alaimo and Kallinikos (2021), increasingly decentred. The argument here is that digital data can no longer be reduced to an element of support or simple optimisation for processes in organisations, but that digital data in the form of "data objects" instead becomes "a pervasive resource and medium through which organizations come to know and act upon the contingencies they confront" (Alaimo and Kallinikos 2022, 20). In this process of decentring, organisations do not vanish as social forms, but they are being called into question "as relatively bounded socioeconomic entities, marked off from others and from their environments" (Santos and Eisenhardt 2005, 3).

In addition to the role of digital data, unfolding the *embedding of algorithms* in organisations is also an ongoing matter of concern. Algorithms function as central elements for reducing reality's complexity by deploying "a logic of the surface" (Krasmann 2020). Conceptually, organisations become relevant in contextualising algorithms because organisations constitute more than just arenas for actions. Instead, they can be understood as social forms that prestructure broad areas of decision-making, e.g., by defining areas of responsibilities, defining formal roles, and prescribing how decisions are made. In this context, algorithms not only operate "in" organisations or become part of algorithmic management but become increasingly integrated into specific positions within existing or adapted architectures of formal decision-making. Literally speaking, it is often the associations in which the algorithm is embedded that empower it, not the algorithm itself (Neyland and Möllers 2017). With regard to modern society, organisations are, without a doubt, central institutions of decision-making (Luhmann and Bednarz 2005; Nassehi 2015), so a discussion of algorithmic decision-making relies not only upon reflecting the roles of humans in the loop (Danaher 2016), but especially that of organisations. In the case of an algorithm in an Austrian job agency, it was shown that the algorithm's prominent placement in the process of taking decisions about unemployment benefit allocations made the algorithm actionable in the first place (Büchner and Dosdall 2021). Although algorithms thus seem embedded in organisations as one layer of sociotechnical assemblages (Kitchin 2017), their analytical disentanglement helps to correct and differentiate attributions of power within the assemblage. These inquiries into "Algorithmic Regimes" (Jarke et al., forthcoming) also point out the ambivalent

role of "organisations in the loop" (Büchner, Dosdall, and Constantiou 2023). Organisations do not only enable algorithms; their formal and informal structuredness is also a central source of friction, barriers, and breaks for algorithmic impacts to unfold. In this line of research, the analysis of the German case of pre-policing showed that the algorithm's relation to organisational goals, the normality of conflicting goals, and the internal differentiation of an organisation like the police limit its influence. Paying attention to these inner complexities and logics of organisations allows an inquiry not only into the "local settings" in which algorithms operate, but into their "typical organisational situatedness" (Büchner and Dosdall 2021, 348). These analytical differentiations are necessary to critically reflect upon the driving forces, antecedents, and enabling factors in change processes.

Paying attention to these specifics of organisations and their ambivalent role in the digital transformation should not be confused with treating the organisation as an encapsulated entity or an "organisational container" – an argument that was made early with regard to digital infrastructures, especially because it enables trans-organisational work arrangements (Winter et al. 2014). However, *organisational boundaries* continue to be highly relevant: Although users might be invited for participation, platform companies decide how interfaces and organisational roles are built (Kelkar 2018). Also, when the need to share data between organisations arises, the question of who takes over the necessary investments in time and resources has to be solved (Mayernik 2017).

In this respect, organisations also play a central role as producers and facilitators of *data work* on a broad scale. In some cases, organisations create new formal roles to deal with data work, such as medical scribes in hospitals to deal with increased expectations regarding documentation and digitalisation through electronic health records (Bossen, Chen, and Pine 2019). Often, data-related work in organisations becomes informally distributed and has to be taken on by someone within the resources available. New data work also accompanies secondary uses of data, such as using hospital data for visions of personalised medicine. Here, "promissory data" can lead to the problem of meaningless data practices on the ground with problematic effects on professional judgments (Hoeyer and Wadmann 2020). Often, these aspects of human facilitation, of ongoing effort and work to develop, maintain, and repair technologies (Schubert 2019), are less visible components of societies' understanding of the digital transformation. However, they are crucial elements of the landscapes of sociotechnical assemblages, reflected in concepts such as heteromation (Ekbia and Nardi 2017) or in newly termed categories like ghost work (Gray and Suri 2019).

Explorations on the meso-level of networks and organisations are also central to the temporalities of change. Suppose social imaginaries and visions are strong driving forces of digitalisation. In that case, *projects* are one of the most

prominent formats in which these futures are brought in contact with the present. Projects are omnipresent forms of temporal organising (Button and Sharrock 1996; Sydow, Lindkvist, and de Fillippi 2004) and forms that literally project the future (Mische 2009). As such, projects draw together stakeholders from different social worlds and provide vessels for technologies to travel between contexts. In the light of rising political expectations placed upon the applicability of research, "digital transformation projects" often involve a considerable amount of invisible work (Star and Strauss 1999) of developing do-able problems (Fujimura 1987) that are solvable and at the same time sufficiently promising for scientists to advance academic careers (Möllers 2017). Meanwhile, high governmental investments in projects that promote successful digital transformation have led some organisations to accumulate multiple, often externally funded "digital projects," which presents a formidable management challenge (Leonardi 2020).

Understanding digitalisation as a genuinely heterogeneous process does not imply getting lost in indeterminate multiplicities, limiting oneself to the reconstruction of different understandings of digitalisation, or retreating to diffuse complexities. Instead, taking heterogeneous digitalisation seriously as a research object means widening the field of vision for co-constitutive structures and processes in empirical studies. It implies thinking of digitalisation in the plural and in the possible simultaneity of different processes of change. In this sense, understanding digitalisation as a heterogeneous process does not imply turning away from or renouncing generalisations. These remain possible, perhaps even desirable, while at the same time we value contextualisation and the need for comparisons to consolidate them.

This HSR Special Issue brings together contributions that explore and analyse these heterogeneities of digitalisation and digital transformation.

The first cluster of contributions analyses the heterogeneity and dynamics of digitalisation in *different social sectors, focusing on the fields of health, construction, and governance*. *Ole Hanseth*'s study analyses the role of changing socio-technical regimes in the formation of Norway's national e-health structure since the 1970s. His analysis raises awareness of the dynamics and the critical role of coalitions and alliances of actors. Although they cannot be organised in a traditional hierarchical way, they form the preconditions for an integrated e-health infrastructure at the national level. The study by *Kathrin Braun, Cordula Kropp, and Yana Boeva* on digitalisation in the construction sector is also dedicated to competing conceptions of digitalisation. Using the example of the socio-technical imaginaries connected with Building Information Modelling, the study illustrates the necessity of combining synchronous and diachronic perspectives on digitalisation to make visible the diversity of different imaginaries of Building Information Modelling and to track the displacement and assertion of specific imaginaries over time. A third contribution is dedicated to the spread of the Open Data Government concept.

Cancan Wang and Jessamy Perriam highlight the often-underestimated importance of emotionality and networks for spreading digital innovations, mapping the role of expert enthusiasts and their networks for open government initiatives since 2009 between the UK and China.

The second cluster of contributions analyses digitalisation processes, focusing on *organisational processes, structures, and discourses*. *Juliane Jarke, Irina Zakharova, and Andreas Breiter* also use a double movement of analysis in their case study, here on the case of datafication processes in schools. The starting point of their reflections is the challenge of making data flow in and between organisations visible - not in an idealised way, but realistically and socially situated. Their analysis of the different horizons of sense in organisations makes a case for combining perspectives that analyse the temporality of data movements and the topology of data movements. A second article focuses on the omnipresent form in which many digitalisation initiatives take place – the form of the project as a temporary organisation. With the intent to optimise organisations' work processes, digital innovation projects are often planned not in a sandbox setting, but explicitly in the daily work setting of professionals, besides their daily workload. *Katharina Braunsmann, Korbinian Gall, and Justus Rahn* explore the complex role of organisations in discourses on algorithmic support systems. Studying the controversial introduction of algorithms in a social administration in Austria starting in 2018, the study reconstructs strategies for legitimizing the algorithm and portraits organisations and their spokespersons in their role of being embedded in discourses as well as exercising power to influence them.

A third cluster takes up the question of *novelty and continuity* in the process of digitalisation and digital transformation. *Alina Wandelt and Thomas Schmidt-Lux* analyse the digitalisation of libraries and the accompanying architectural change. Their analysis traces various temporal processes of change, ranging from trajectories to turning points to cyclical patterns. *Moritz von Stetten's* dispositive analysis of the field of psychotherapy also provides a view of complex and, thus, ambiguous processes of change. Based on the thesis of a "non-simultaneous simultaneity of continuity and change," he traces fundamental drifts in the dispositive of psychotherapy. *Julia Mahnken's* article explores the potential of Norbert Elias's figuration and process sociological approach to studying long-term shifts in police work. Analysing the case of the online drug platform "Chemical Revolution," she illustrates the capacity of Elias's approach to grasp the simultaneity of continuation and shifting power changes under digital conditions on the micro-, meso-, and macro levels for police work.

The concluding cluster leads us to the exploration of digitalisations in areas of research that often seem to be pushed to the *peripheries* of research interest. *Julia Binder and Ariane Sept* explore the changing importance of peripherality, exploring how digitalisation in peripheral spatial locations occur and

imprint individual digital biographies of their inhabitants. Finally, *Irem Ozgren Kinli and Onur Kinli* provide insights into the various forms of digital inclusion of the elderly in Turkey. Based on an interview-study, Kinli and Kinli analyse the use of digital communication tools of the Turkish middle class on the levels of individuals, social interactions, and governance.

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