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## Responsibility of/in digital transformation

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### ABSTRACT

In this editorial, we chart a path for research on responsible digital transformation (DT). We draw on responsible innovation to provide a framework that can inform the research agenda of the emerging literature of responsible DT. First, we outline what we refer to as DT and how the existing debate overlooks key issues for making DT responsible. Second, we draw on the concept of responsible innovation to examine the meaning of responsibility in the context of innovation and translate it to DT. This leads us to understand responsible DT as two-dimensional including a process and an outcome dimension. Accordingly, we pose two questions: (1) when we can consider a DT process responsible (i.e., responsibility in DT), and (2) when we can consider DT outcomes responsible (i.e., the responsibility of DT). Offering suggestions on how we can approach studying these questions, we chart a path for responsible DT research. This path presents a new frontier within the DT discourse calling to our attention how DT—if we make responsibility of/in DT explicit—can be the solution rather than the problem.

### Introduction

In this editorial, we chart a path for research on responsible digital transformation (DT). DT at societal, organizational, and individual levels presents a key discourse in research and practice (Baiyere et al., 2021; Bughin et al., 2019; World Economic Forum, 2021). This discourse understands DT's core premise as delivering improvements through digital innovations and/or the development, implementation, and use of digital infrastructures (Carroll et al., 2023; Vial, 2019). In the literature, we observe that much of the DT discourse to date, particularly at the organizational level, has focused on economic improvements (Barthel, 2021; Hanelt et al., 2021; Tumbas et al., 2018). However, we also see nascent studies that suggest organizational DT as a means to deliver social or environmental improvements (e.g. Graf-Drasch et al., 2023; Pappas et al., 2023; Zimmer et al., 2023). This emergent literature evokes a sense of responsible DT in that it emphasizes other outcomes than economic improvements; but does this make DT responsible?

In our discussion here, we start with the observation that *responsibility* means being able to or having an obligation to respond. This raises the question of who should respond to whom and in response to what in responsible DT.

When responding to this question, we first need to understand the inner logic that is often employed to conceptually grasp DT. In the extant literature, scholars often anchor DT in the organizing logic of digital innovation (Carroll et al., 2023; Yoo et al., 2010). According to this logic, such innovation in terms of digitally transforming organizations' value creation leads to a more networked understanding of where and how value is created (Lyytinen et al., 2016; Nambisan et al., 2017). Organizations involved in DT establish, join, and operate in digital innovation ecosystems comprising multiples actors, whose shared

activities produce digital innovations (i.e., products, services, processes, or even business models) and/or infrastructures that can trigger significant changes (Nambisan et al., 2017; Vial, 2019; Yoo et al., 2010). It is these fundamental changes that then, in turn, digitally transform the respective organizations (Wessel et al., 2021). Whether these innovations and the changes they cause transform organizations and the ecosystems they are embedded in a lasting fashion depends on market mechanisms, which help us understand which changes are viable and economically sustainable in the long run (Vial, 2019).

This understanding outlined in the existing literature rests on management frameworks that root responsibility in shareholder value maximization, the profit paradigm, continuous growth, or the instrumentalization of people and environment. This limits the stakeholders to whom organizations must respond to shareholders (Laasch et al., 2020). Shareholders are primarily interested in economic value, which we see reflected in the focus of existing DT work on DT success in the sense of economic improvement (Barthel, 2021). More critically, this shows that the frameworks that underpin DT research emphasize responsibility to shareholders. In contrast, the emerging literature on responsible DT suggests that responsibility exists also toward other stakeholders (Lobschat et al., 2021; Mueller, 2022; Trier et al., 2023).

In contrast, we see less existing work on responsible DT that addresses grand challenges and negative DT effects (Lichtenthaler, 2021; Marjanovic et al., 2021). The grand challenges are, for example, climate change, loss in biodiversity or poverty (European Union, 2010; Henriksen et al., 2021; United Nations, 2016). Negative DT effects are, for example, algorithmic pollution (Marjanovic et al., 2021) or technostress (Nastjuk et al., 2023). The focus on grand challenges implies that DT is a solution, whereas the focus on negative effects emphasizes DT outcomes. However, both perspectives share that they broaden the group of

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stakeholders to whom organizations are obliged to reply when digitally transforming. They add the environment, society and individuals to the stakeholders in organizations' DTs (Nguyen et al., 2023; Zimmer & Järveläinen, 2022), a move also indicated in the growing literature on digital responsibility (Lobschat et al., 2021; Mueller, 2022; Trier et al., 2023). This highlights that the growing body of literature that we refer to as responsible DT requires alternative frameworks that help us examine, understand, and define when, to whom, and in response to what DT is responsible.

In this editorial, we draw on responsible innovation to provide a framework that can inform the research agenda of the emerging literature of responsible DT. First, we outline what we refer to as DT and how the existing debate overlooks key issues for making DT responsible. Second, we draw on the concept of responsible innovation (von Schomberg, 2013) to examine the meaning of responsibility in the context of innovation and translate it to DT. This leads us to understand responsible DT as two-dimensional including a process and an outcome dimension. Accordingly, we pose two questions: (1) when we can consider a DT *process* responsible (i.e., responsibility *in* DT), and (2) when we can consider DT *outcomes* responsible (i.e., the responsibility *of* DT). Offering suggestions on how we can approach studying these questions, we chart a path for responsible DT research. This path presents a new frontier within the DT discourse (Baiyere et al., 2021) calling to our attention how DT—if we make responsibility of/in DT explicit—can be the solution rather than the problem (Veit & Thatcher, 2023).

## Digital transformation

DT remains an elusive concept. While some use this label to refer to well-known phenomena of IT-enabled transformation, others evoke it to signify a qualitatively different phenomenon of transformation that warrants a new label (Baiyere et al., 2021; Markus et al., 2023). Here, we draw on Vial (2019) who defines DT as “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technology” (p. 121). This definition suggests that DT's core premise is improvement through digital innovations and/or the development, implementation, and use of digital infrastructures (i.e., combinations of digital technology) (Carroll et al., 2023; Hinings et al., 2018; Vial, 2019). DT success thus depends on whether the DT process creates outcomes that reflect improvements (Barthel, 2021). This poses several questions, for example, why we require improvement of the status-quo as well as what should DT improve and for whom; or how can we evaluate this improvement? These questions, which consciously or subconsciously underpin our understanding of the DT process and its success, present questions of responsibility (Rowe, 2018; Stahl, 2012; von Schomberg, 2013). However, until now, we have left the answers to these questions to market mechanisms.

Digital innovations or new uses of digital infrastructures that entail disruption, are trigger points for DT (Vial, 2019; Wessel et al., 2021; Zimmer et al., 2023). Whether or not they actually trigger DTs depends on and works through market mechanisms. If they satisfy individual or collective needs, they become widely adopted, thereby engendering changes that constitute DT trajectories. That is, their market success determines their DT success. For example, organizations evaluate their DT by assessing the increase in revenue that underlying digital innovations create, the increase in new customers because of improved customer orientation, or the development of new digital business ventures (Barthel, 2021; Vial, 2019). These examples of criteria indicate that DT success reflects the market success of the digital innovations (or infrastructures) that underpin DT. This market success produces economic value, which reflects organizations' responsibility to their shareholders as rooted in widespread management frameworks (Laasch et al., 2020). However, market success can also engender unintended DT trajectories.

The transformation trajectory depends on how multiple actors adapt,

use, and develop the underpinning digital innovation (or infrastructure). Digital innovation's new organizing logic means that multiple actors work in ecosystems co-creating DT trigger points (Lyytinen et al., 2016; Yoo et al., 2010). This complicates matters of responsibility because responsibility becomes distributed among multiple actors (Floridi, 2015). Moreover, the activation of these trigger points through market mechanisms lends them, once released, a life of their own. This makes controlling, steering, or foreseeing their distribution and thus, the resulting transformation trajectory a nearly impossible task (Albrecht-slund, 2007). Indeed, we see evidence of unintended DT trajectories in terms such as side effects, corollary effects, or dark side of DT, which we—practitioners and scholars—use to refer to phenomena such as technostress, algorithmic pollution, e-waste, greenhouse gas emissions, etc. which involve adaption and use of digital innovations (or infrastructure) (Marjanovic et al., 2021; Nastjuk et al., 2023; Zimmer & Järveläinen, 2022). We refer to these effects as un-intended because we assume that the intention that underpins related transformation processes was to improve the status quo within a specific context, while these effects emerge un-intentionally. Regardless, this un-intendedness emphasises two issues for the emerging body of *responsible* DT (e.g. Graf-Drasch et al., 2023; Pappas et al., 2023; Zimmer & Järveläinen, 2022). First, existing DT research links DT success to market mechanisms. Second, the understanding of responsibility roots in management frameworks that rest on shareholder value and are inadequate in scenarios of shared responsibility. Both issues can entail irresponsible DT outcomes making DT appear as a problem (Veit & Thatcher, 2023). Hence, responsible DT requires alternative frameworks to inform research on how DT can be a means to address the grand challenges of our times.

## When is digital transformation responsible?

### *The question(s) of responsibility*

Etymologically, responsibility traces to the Latin word *responsum*, meaning, reply. Responsibility thus refers to the ability or obligation to reply. A reply involves not only the entity that has responsibility but also an entity toward which this responsibility exists (Stahl, 2012; von Schomberg, 2013). This relational aspect of responsibility, however, is not bilateral but multilateral. We are not only responsible to one entity but multiple entities; we not only bear responsibility to one stakeholder, but multiple ones—an aspect particularly salient in every more digitalized contexts (Stahl, 2022). In the context of research, innovation, and technology, being responsible requires “stakeholders to become mutually responsive to each other, anticipating research and innovation outcomes aimed at the “grand challenges” of our time, for which they share responsibility” (von Schomberg, 2013, p. 51). This outlines two questions of responsibility within the context of DT:

- What do we consider as the grand challenges that DT should address to deliver responsible improvements on?
- How can we direct DT trajectories to accomplish these improvements responsibly?

These two questions are indicative of the outcome and process dimensions of responsible DT. We refer to the first as the responsibility *of* DT (i.e., outcome) and the second as the responsibility *in* DT (i.e., process).

### *Responsibility of digital transformation*

Responsibility *of* DT deals with the question of what we consider responsible improvements. This first question focuses on defining responsible DT outcomes. DT outcomes refer to the societal, organizational, and individual level changes that DT produces (Vial, 2019). Answering this question requires a shared set of values that stakeholders

of DTs subscribe to and which allows them to determine what they consider to be responsible improvements as well as to evaluate to what degree the outcomes of DT can be considered responsible (von Schomberg, 2013).

Respective sets of values exist, for example, in the form of the Charter of Fundamental Rights of the European Union (CFREU, 2012) or the United Nations' (UN) Universal Declaration of Human Rights (UDHR, 1948) as well as in agendas, declarations, or treaties in accordance with the values manifested in these statutes; for example, the Treaty of the European Union (EU) (European Union, 2010) or the UN's sustainable development goals (United Nations, 2016). These reference points not only reflect and manifest certain values but define the grand challenges of our time such as climate change, loss in biodiversity, poverty, access to medical treatment and education, or equality (European Union, 2010; United Nations, 2016). Moreover, they all originate from an entity that has democratic and/or legal legitimacy. Arguably, this renders them adequate reference points for determining responsible DT outcomes for two critical reasons.

First, the reference points' democratic (and/or legal) legitimacy makes them manifestations of societal values. This means, societal actors, individuals, and organizations agreed on these reference points when subscribing to the democratic processes that produced them. On the one hand, this legitimizes respective reference points as agreed sets of values for defining responsible DT outcomes. On the other hand, this requirement for democratically produced reference points prevents the use of arbitrarily defined value sets as reference points for responsible DT (von Schomberg, 2013). After all, economic improvements alone are only indicative of a company's responsibility to its shareholders but not necessarily to the environment and/or society (Veit & Thatcher, 2023; Zimmer & Järveläinen, 2022).

Second, the stakeholders for DT are manifold. This creates practical difficulties in agreeing on a reference point for shared values (Graf-Drasch et al., 2023; Kneissel et al., 2023). For example, actors creating trigger points for potential DTs cannot survey all potential stakeholders (e.g., individuals—or a representative sample, partner organizations, non-users, future employees, etc.) on the shared values that should underpin this trigger point and subsequent transformations. This makes it a practical necessity to revert to existing reference points if these reference points emerged through democratic processes.

Hence, responsibility of DT requires a shared set of values, a normative reference point, to determine and evaluate when DT outcomes are responsible improvements. In this editorial, we refer to the UN's sustainable development goals and the UN's Universal Declaration of Human Rights as reference points for responsible DT. Accordingly, we put forth that responsible DT outcomes must address and should be evaluated vis-à-vis the grand challenges of our times. In other words, research and practice on responsible DT must strive to reach beyond a mere economic bottom line.

A resulting challenge once the reference points are agreed relates to the question whether the DT process will be or has been successful in promoting change in the direction of these reference points. Agreement on principles does not guarantee agreement on the means to achieve these or agreement on the evaluation of success. This points to questions of evaluation mechanisms as well as the internal structures of responsible DT.

### *Responsibility in digital transformation*

Responsibility in DT deals with the question of how to direct DT trajectories to accomplish responsible DT outcomes in a responsible manner. This second question focuses on establishing a responsible DT process (Stahl, 2022; von Schomberg, 2013). Answering this question requires DT stakeholders to become mutually responsive to each other on how they accomplish DT responsibly but also on how they steer the DT processes toward responsible outcomes. This dimension of responsible DT reveals an important entanglement between the two questions

regarding responsibility in DT we discuss here: First, steering the DT process toward responsible outcomes. Second, accomplishing these outcomes responsibly.

The first facet focuses on steering the DT process toward responsible outcomes. This takes into account that DT is a process and thus, DT outcomes are a moving frontier. While an outcome might at first seem responsible, subsequent evolutions may exhibit irresponsible features. This requires steering the DT process toward responsible outcomes. This steering involves defining criteria for evaluating whether the DT outcome complies with or conflicts with the a priori defined reference point. This can involve evaluating, for example, whether and how smart production systems contribute to circularity (Graf-Drasch et al., 2023). Moreover, the stakeholders must regularly evaluate the DT outcomes against these criteria. If these evaluations reveal that the outcomes miss meeting these criteria, the stakeholders must agree on and take suitable countermeasures. Through these practices of defining criteria, evaluating outcomes, and taking measures, the stakeholders create a transparent and interactive process of steering the DT process toward responsible outcomes.

The second facet focuses on the responsible design, development, and use of digital innovations (or digital infrastructures) that trigger DT. Similarly to the first facet, this second one requires stakeholders to interact and become mutually responsive to each other on whether the chosen means for DT—the designed and developed trigger point—comply with the agreed reference point on shared values. This can involve choosing the option that least conflicts this reference point. The issue of least conflicting option roots in digital being simultaneously part of the solution and the problem (Veit & Thatcher, 2023). For example, designing, developing, and using digital innovations produces greenhouse gas emissions but the innovation can be designed to facilitate behavior that reduces greenhouse gas emissions (Bengtsson & Gerfalk, 2011; Hanelt et al., 2017; Melville, 2010). Similarly, digital innovations can contribute to accomplish strategic goals while simultaneously conflicting these goals. Imagine, for example, an environmental NGO using digital infrastructures and innovations to operate and reach people with their message to fight climate change. This paradoxical relation between digital innovations and responsible outcomes creates trade-offs that involve choosing the least conflicting option for accomplishing DT outcomes. The importance of this second facet lies in creating transparency on these trade-offs, that is, rendering transparent how the technological choices underlying the DT process live up to the stakeholders' chosen normative reference point.

Hence, responsibility in DT requires an interactive and transparent process by which stakeholders become mutually responsive to each other, that they take an ecosystem perspective (Stahl, 2022) in evaluating and steering the DT process toward accomplishing responsible outcomes responsibly. The first facet recognizes the processual nature of DT that makes DT outcomes a moving frontier and thus emphasizes the steering towards responsible outcomes. The second stresses accomplishing these outcomes responsibly. Jointly, they render the DT process a responsible means to responsible ends.

### *Research agenda on responsible digital transformation*

These two naturally interrelated dimensions—responsibility in and for DT—suggest that:

*Responsible DT is an interactive, transparent process by which stakeholders become mutually responsive to each other to accomplish DT outcomes in accordance with a shared normative reference point.*

To grapple with how society, organizations, and individuals can engage in responsible DT for a better world, we require empirical work and theorizing on responsibility of/in DT. We use this editorial to outline such a research agenda in Table 1.

Table 1 outlines a first set of exemplary questions in the two dimensions of responsible DT that require answers if we are to understand how we can enact responsible DT. However, we do not propose

**Table 1**

Research agenda on understanding how we can establish responsible digital transformation.

Questions of responsible digital transformation	Research agenda
<p><b>Responsibility of DT</b>  <i>Deals with the question of when are DT outcomes responsible, that is, what we consider responsible outcomes.</i></p>	<ul style="list-style-type: none"> <li>• What kind of reference points can be used in studying responsible DT?</li> <li>• What kind of outcomes does responsible DT aim for and which outcomes does it accomplish?</li> <li>• What kind of measures should determine the responsibility of DT outcomes?</li> <li>• How (can) stakeholders negotiate the reference points?</li> <li>• How (can) stakeholders derive evaluation criteria from reference points?</li> <li>• How (can) stakeholders anticipate responsible DT outcomes?</li> <li>• How can stakeholders assess the impact or consequences of DT?</li> <li>• How can we identify relevant stakeholders for responsible DT processes?</li> <li>• How can we involve stakeholders in steering DT processes?</li> <li>• How can we engage stakeholders equally in regularly evaluating DT outcomes?</li> <li>• What kind of frameworks to use in the evaluation process?</li> <li>• How (can) stakeholders steer the process?</li> <li>• How (can) stakeholders render the DT process transparent?</li> <li>• How (can) stakeholders negotiate accomplishing the DT responsibly?</li> </ul>
<p><b>Responsibility in DT</b>  <i>Deals with the question of when is the DT process responsible, that is, how we can accomplish DT responsibly.</i></p>	

establishing responsible DT as a new or separate research stream to existing DT. Rather, we understand responsible DT as an umbrella concept encompassing existing and ongoing work, for example, on digital-sustainable co-transformation (Zimmer & Järveläinen, 2022), twin transformation (Graf-Drasch et al., 2023; Hansen et al., 2023), digitainability (Lichtenthaler, 2021), corporate digital responsibility (Lobschat et al., 2021; Mueller, 2022), or digital ecosystems ethics (Stahl, 2022). The outlined questions on responsible DT thus chart a path for future investigations in this existing and ongoing work toward understanding when DT is responsible and thus, how we can develop and establish alternative frameworks for responsible DT. We are thus suggesting that responsible DT constitutes a novel emphasis of DT. However, we suggest that engagement with this new emphasis is crucial for DT to remain a legitimate research activity.

Hence, in this editorial, we present the notion of responsible DT as a new frontier for DT research. DT has become an established research stream within information systems and organizational transformation research (Chanias et al., 2019; Vial, 2019; Zimmer et al., 2023). Existing work anchors DT in digital innovation (Carroll et al., 2023; Hinings et al., 2018; Wessel et al., 2021) and suggests the core premise as improvement through digital innovation and the design, development, and use of digital infrastructures. We observe the emergence of studies that draw on this premise to conceive of DT as a means to deliver responsible outcomes, meaning, improvements concerning the grand challenges of our times. We suggest caution concerning this notion considering that DT’s anchor in digital innovation rests on management frameworks that emphasize shareholder instead of stakeholder value.

In supporting and further encouraging future work on responsible DT, our discussions here start with the question: when is DT responsible? In pursuit of a first answer to this challenge, we draw on responsible research and innovation to develop two dimensions of responsible DT: responsibility of DT and responsibility in DT. In line with contemporary

calls for new frontiers in DT research (Baiyere et al., 2021; Carroll et al., 2023), we propose that responsible DT presents such a new frontier. Considering the grand challenges of our times, and the mixed evidence to date as to whether digitalization at large can make a positive contribution to addressing them (Popkova et al., 2022), we call researchers to explore and question assumptions on responsibility of/in DT to build a body of knowledge on responsible DT.

**Declaration of Competing Interest**

We declare that we have no conflict of interest.

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