From Private Digital Platforms to Public Data Spaces

Implications for the Digital Transformation

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PREFACE

From private digital platforms to public data spaces: implications for the digital transformation

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Abstract
Technological developments such as Cloud Computing, the Internet of Things, Big Data and Artificial Intelligence continue to drive the digital transformation of business and society. With the advent of platform-based ecosystems and their potential to address complex challenges, there is a trend towards greater interconnectedness between different stakeholders to co-create services based on the provision and use of data. While previous research on digital transformation mainly focused on digital transformation *within* organizations, it is of growing importance to understand the implications for digital transformation on different layers (e.g., interorganizational cooperation and platform ecosystems). In particular, the conceptualization and implications of public data spaces and related ecosystems provide promising research opportunities. This special issue contains five papers on the topic of digital transformation and, with the editorial, further contributes by providing an initial conceptualization of public data spaces' potential to foster innovative progress and digital transformation from a management perspective.

Keywords Digital transformation · Public data spaces · Digital platforms · GAIA-X

Public data spaces as a new form of digital platforms

Managing an organization's digital transformation is a company-wide effort, including several business areas, departments, and hierarchy levels. Enabling an organization and its people for a digital transformation means setting up the respective structures, culture, IT landscape, and capabilities to lay the groundwork for a successful implementation of important digital innovations (Hess & Barthel, 2017; Wiesböck & Hess, 2020). Indeed, such digital transformation initiatives are long-term, complex, and non-linear. Thus, organizations need dedicated approaches for governing the overall transformation: defining specific digital transformation strategies (Hess et al., 2016) as well as the respective processes to include emerging perspectives in the formulation process (Chanias et al., 2019), setting up the organizational and IT-related structures in which the transformation can thrive, assigning suitable management roles to coordinate and lead those efforts (Haffke et al., 2016; Singh & Hess, 2017), and managing the interrelated portfolio of multiple simultaneous digital transformation projects that implement digital innovations (Barthel & Hess, 2019).

Since the inception of the Internet 25 years ago, the emergence of information and communication technologies has enabled the low-cost exchange of data among actors, providing new opportunities for business innovation across organizational boundaries. The emergence of interorganizational cooperation in supply chains and business networks has been a powerful and widespread manifestation of this trend, while more recent examples comprise the Internet of Things or Cloud Computing. These trends are based on the increasing interconnectedness of organizations to exchange data in the context of value co-creation (El Sawy et al., 2010), making

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digital transformation a boundary-spanning phenomenon that can no longer be confined to the organizational level alone (Hanelt et al., 2021). Clearly, organizations do not act in isolation, but shape their environment and are shaped by it—with evident consequences for digital transformation initiatives.

Reaching beyond the organizational level and interorganizational cooperation, digital platforms have been subject to Information Systems (IS) research for more than four decades (Bartelheimer et al., 2022). Digital platforms that are well-known by consumers include Amazon Marketplace, Airbnb, and Uber, while business-to-business platforms are also proliferating, even if they lack a similar degree of public attention. While platform concepts have been used in surprising variety, digital platforms refer broadly to "generative IS artifacts that provide a mutual core of technology and organizational arrangements, inviting compatible and complementary resources (e.g., hardware, software, or content) from third parties, to enable the emergence of digital online communities or markets" (Bartelheimer et al., 2022, p. 15; De Reuver et al., 2018). Several related concepts have been identified that provide more specific views on platforms, for instance, service platforms, cloud platforms, IT platforms, social platforms, and two-/multi-sided markets (Bartelheimer et al., 2022).

Cloud platforms, in particular, provide a technology-focused view on platforms as IT artifacts involving "an operating system that runs in the cloud and provides infrastructure, development platforms for software, or software as a shared pool of virtualized resources that is scalable and available" (Bartelheimer et al., 2022, p.15). For example, a well-established commercial cloud platform is Google Cloud Platform, which provides access to physical assets and computing resources hosted in Google's data centers (Google, 2021a). The platform offers cloud storage, compute engines, software development tools, database solutions, analytics solutions, and many other resources to be accessed and used by customers for a fee, enabling them to design, implement, and run their solutions on Google's infrastructure (Google, 2021b). On the other side of the market, third-party vendors can become partners to offer their solutions on a marketplace. Thus, the Google Cloud Platform constitutes a digital, multi-sided market for computing resources and solutions, establishing direct interactions between service providers and customers. In addition, however, many computing resources and solutions are offered by Google. While building a technology stack on Google's technology means hosting crucial data on their servers, Google has established means to protect their customers' data from unauthorized access by third parties and the platform provider itself (Google Cloud, 2019). Other commercial cloud platforms implementing similar business models include Microsoft Azure, SAP Cloud Platform, Salesforce Cloud Platform, Hewlett Packard Enterprise Greenlake edge-to-cloud platform, or Siemens Cloud Connect. In a similar vein, cloud platforms have also proliferated in consumer filesharing services, such as Dropbox. Each of these platforms is owned by a commercial platform provider.

Breaking free from ownership by a single commercial company, public data spaces are emerging as a new form of digital platform, changing the rules of the game for organizations seeking to create data-driven innovations and shape digital transformation (European Commission, 2019). For example, in Europe, a public data space based on a federated digital infrastructure is envisioned to be implemented by the International Data Spaces Association under the label GAIA-X. Being not only a technological but also a political initiative, GAIA-X aims to foster a trusted data ecosystem and ensure the pillars of cloud sovereignty and data sovereignty so that organizations can build business models without being subject to the data hegemony of American (GAFAM) and Chinese (BATX) tech giants (Braud et al., 2021). Core principles guiding this approach include openness and transparency, authenticity and trust, digital sovereignty and self-determination, free market access and European value creation, modularity and interoperability, and user-friendliness.

The GAIA-X ecosystem comprises an infrastructure ecosystem—featuring federated computing resources—and a data ecosystem—providing secure and confidential access to data as resources on which digital services can be established. GAIA-X is intended to function as a kind of open public infrastructure on which private and public organizations can build their services and share their data, governed by European standards for data protection and sovereignty. Applications and data will be made available and found based on self-descriptions that allow for semantic data processing, making them available as resources to be accessed by other parties. Actors wishing to participate need to complete a certification and onboarding process, in which their identity and compliance with the established rules are certified (Otto et al., 2021). The particularities of the European legislative environment governing GAIA-X are addressed in more detail by Van Dijck (2021). Additionally, Richter and Slowinski (2019) discuss how data intermediary platforms could create a self-regulatory and transparent data market that implements the FRAND (fair, reasonable, and non-discriminatory) principles along with patterns of company interaction.

We posit that public data spaces deviate from the private digital platforms currently discussed in the academic literature, since they establish an ecosystem view on digital business models that creates new opportunities and challenges for providers and users cooperating in data spaces. We exemplify some differences by referring to the fundamental

Table 1 Comparison of private digital platforms and public data spaces

Concepts	Private Digital Platforms	Public Data Spaces
Ownership	A commercial actor is the focal actor and owner of a private digital platform	A public data space is owned by a consortium of public and commercial actors
Openness	A commercial owner specifies the desired degree of openness of a private digital platform. The degree of openness is often designed to maximize the platform owner's profit	A public data space is an open, digital public infrastructure that is open for third parties to join and interact with
Affiliation	Users and third-party service providers need to affiliate themselves with a private digital platform, e.g., through establishing user profiles, entering data, receiving permissions, or paying fees. With their affiliation, they make a specific investment that might cause switching costs, lock-in, and opportunistic actions by others	Users need to affiliate with and be certified to use a data space, completing an onboarding process. While they make a specific investment, no single actor's opportunistic actions could exploit the specific investment. Public data spaces are designed to avoid vendor lock-in
Direct Interactions	Actors situated on different sides of a market interact directly to co-create value, while a digital platform provider often claims a share of the transactions' value. Beyond enabling direct interactions, the platform provider might also offer their own value propositions on the platform	Actors participating in data spaces interact directly, while their interactions can involve multiple parties. Beyond interacting, they need to establish their own rules and governance mechanisms to frame their interactions since a data space is an open infrastructure that leaves open how particular transactions are governed
Network Effects	Digital platforms can produce direct and indirect network effects on the partners involved with the platform. Most platforms represent two-sided markets, involving two groups of actors	Data spaces can produce direct and indirect network effects on the partners involved with the platform. Beyond that, they constitute large digital ecosystems in which multiple groups of actors cooperate, leveraging complex types of network effects that point beyond the criteria of economic exchange
Data Sovereignty and Infrastructure	In essence, the data on a digital platform are provided by external actors, while a platform provider specifies how the data are used. Also, they might use the data for their own purposes, subject to legal or contractual regulations	Data established in a public data space are provided by the actors or the public, but no single actor can specify how data are used. Beyond legal or contractual regulations, participants subscribe to a code of conduct to use others' data responsibly
Democratization and Transparency	Establishing and sustaining digital platforms is a complex and long-term commitment. Few companies can make it through this process, establishing a dominant platform business model. Private digital platforms might create a winner-takes-all market, in which most other actors are limited to taking the role of market participants	As public infrastructures, public data spaces enable all actors (including SMEs) to build on a stack of technology to implement their own business models without a central authority to control or participate in their business models. Still, even more profound winner-takes-all situations might occur for value propositions offered on the data space
Authenticity, Data Protection, Trust, and Security	Data protection is subject to the platform owner's home state, leaving its mark on data protection standards and legal regulations. Private platform providers may establish additional standards governing the design and use of their tools	As public infrastructures, data spaces must demonstrate to implement local data protection laws. Beyond this, there is an explicit obligation to offer and use the infrastructure in a way that is consistent with societal values, including openness, trust, and democratic principles

concepts that constitute digital platforms—including ownership, openness, affiliation, direct interactions, and network effects (Beverungen et al., 2020)—and other core principles that differentiate private digital platforms and public data spaces in Table 1.

While public data spaces have yet to prove their usefulness and complementarity or superiority to rival approaches, their emergence can be expected to strongly influence companies' digital transformation paths and the very nature of the digital transformation. We visualize these implications in the form of a Digital Transformation Target in Fig. 1. Arguably, the emergence of public data spaces will add an ecosystems perspective to the digital transformation, which reaches beyond an organization (focusing on an organization's internal transformation) and an interorganizational level (focusing on the transformation of business relationships with few external actors in customer/vendor relations, supply chains, or business networks). Also, the public ecosystem constituted by a public data space differs from an ecosystem constituted by a private digital platform (focusing on the transformation of multi-sided markets governed by platform providers that enable direct interactions among the actors on both sides of a market). While many of the requirements constituting the digital transformation will remain important, we posit that public data spaces will add another dimension to the digital transformation that reflects back to the organizational and interorganizational levels.

While these additional dependencies can increase the level of complexity faced by organizations striving to utilize public data spaces, data spaces might also provide new

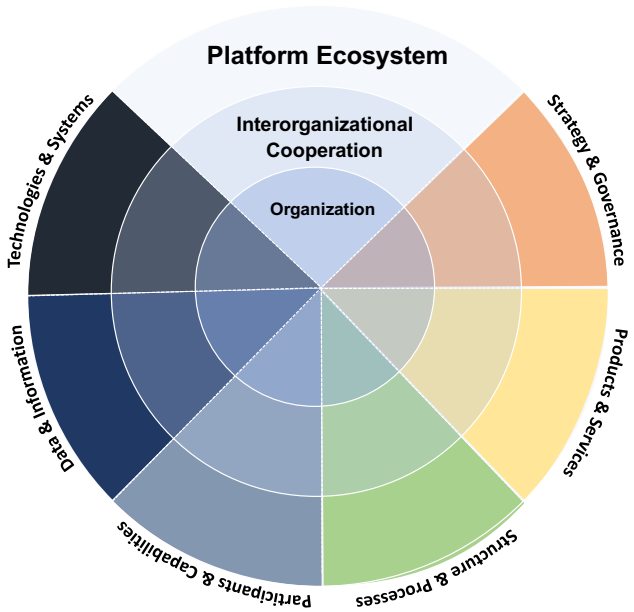

Fig. 1 Digital transformation target (considering six areas on three abstraction levels)

prospects for digital innovation on an ecosystem's level. To capitalize on this innovation potential, companies embarking on this journey need to transform even more profoundly to make themselves ready for interacting with others in an innovation ecosystem. Considering the literature on digital transformation (Wiesböck & Hess, 2020), we propose that this journey involves multiple aspects in an organization that mutually influence each other, making the digital transformation a particularly profound effort (Fig. 1).

While the impact of public data spaces on IS research and business practice is nascent, we venture an initial look at the technology's implications on digital innovation and transformation (Sect. 2), before discussing its implications for IS theory and practice (Sect. 3). We complement these insights with selected research questions that might inspire further research in this area. We conclude by summarizing key findings from the papers published in this special issue, highlighting their contributions to the emerging issues related to public data spaces (Sect. 4).

Challenges for the digital transformation in a public platform ecosystem

While the digital transformation of a single organization is no trivial task, transforming as part of a dynamic platform ecosystem is even more complex, since the ecosystem's transformation is emerging beyond the control of any single actor, including the platform owner (Poniatowski et al., 2021). Aligning internal and external stakeholders alike and ensuring compatibility of the inner-organizational IT landscape with the data space infrastructure, and thus, an organizations' peers, calls for new perspectives on and approaches to the scope of digital transformation.

Data spaces, especially public data spaces such as GAIA-X, challenge existing assumptions of the process of digital transformation for three reasons. First, the involvement of other external actors is still a challenge for the digital transformation of an organization. Second, within platform ecosystems, the locus of digital innovations seems to move even more from the organizational level to an ecosystem level. Third, public data spaces lack a single platform owner attempting to manage the platform ecosystem, empowering the actors to participate in steering the ecosystem's further course. The consequences of this shift for the digital transformation are yet to be understood since the process of embedding digital innovations in the organization seems to be, more than ever, tightly connected with the organization's ecosystem ties (Vial, 2019). Thus, the technology-push–pull dynamic is likely to be extended by an ecosystem dimension, so that the organization faces innovative business needs and domain requirements emerging from within

and, additionally, from the ecosystem. Similarly, innovative digital solutions and technologies from both the organization and the ecosystem environment are likely to influence the organization. The management of this dynamic interplay increases the complexity of successfully handling digital innovations.

Further, the co-innovation within data spaces raises questions about whether aligning a growing number of diverse actors bound together by dependencies associated with the respective focal product or service is feasible without an overarching goal and an enforcing governance structure. Since digital innovations are placed at the intersection of organizations and their ecosystems, the question of responsibilities for embedding digital innovations will likely play a crucial role, requiring the definition of specific roles. The more players with differing agendas regarding the implementation of digital innovations and the respective organizational structures are involved, the more likely clashes of competing logics and differing assumptions are to occur–intraorganizationally and interorganizationally. To overcome these frictions within a digital transformation and even turn them into sources of innovation adds another task to managers' to-do lists. Given the freedom of members of public data spaces with which they can govern transactions, the governance and structure of any form of cooperation might need even more managerial attention, given the lack of intermediary services compared to commercial platforms. Is the self-governance on public infrastructures self-sustaining, or can we expect trajectories towards the establishment of powerful intermediaries, calling the fundamental assumptions of public data spaces into question? How should managers think of digital innovations and digital transformation when its ramifications go beyond the organization and its success is highly dependent on an uncertain and dynamic ecosystem?

Existing literature on public data spaces in the IS field focuses on data as a key resource (Otto & Jarke, 2019; Richter & Slowinski, 2019). The recognition of data as a strategic resource for innovation and value creation and the public interest in fostering data spaces and related ecosystems are just beginning to attract research attention (Oliveira et al., 2019). Indeed, existing studies on data spaces deal with their technical and regulatory aspects. On the one hand, they explore the technical foundations necessary to promote data sharing and data pooling arrangements in a secure and trustworthy way (Gaia-X European Association for Data & Cloud AISBL, 2021). On the other hand, the literature assesses the relevance and design of these data spaces in the context of European values related to data sovereignty and privacy regulations (Braud et al., 2021; European Commission, 2020). Despite the rising volume and economic importance of data, research on the management of data spaces and the efforts of organizations to transform their business in a public (data) ecosystem is still limited (Lis & Otto, 2020; Otto & Jarke, 2019).

From the perspective of the digital transformation of organizations, we posit several aspects that require more attention by scholars, practitioners, and policy makers alike:

- **Solving complex societal problems**: In public data spaces, organizations leverage digital innovations together, offering their operant resources (i.e., knowledge and skills) and operand resources (i.e., digital infrastructure, smart products, data, service) to others as value propositions. Organizations engage in complex networks to co-innovate, building on the principles of recombinant innovation (addition, association, dissociation, recombinant resources) (Beverungen et al., 2018). Public data spaces might enable us to solve the most complex problems faced by our society, unleashing digital resources and putting them together into new and complex solutions.
- **Fair distribution of profits**: Public data spaces differ from commercial platforms, as they have been established in many commercial and non-commercial scenarios. While platforms are hosted by platform owners to engage external participants (e.g., service providers like mobility companies and service customers) in a co-creation of value, claiming a share of the transaction value for matching the participants, data spaces are digital infrastructures on which dozens or even hundreds of participants can engage with each other to co-innovate new solutions. However, in the context of digital transformation, organizations seek to exploit the potential of data for their own benefit, or in some cases, to monetize these data by selling them to third parties (Loebbecke & Picot, 2015). Especially, if access to public data (e.g., through data donation) disproportionally promotes profits of commercial companies, this could lead to increased resistance and decreased trust in public data spaces due to a lack of reciprocity.
- **Complexity-efficiency paradox for involved organizations**: We posit that co-innovation in public data spaces is subject to a paradox: Networking diverse resources can enable organizations to co-innovate more sophisticated solutions that might be able to solve heretofore unsolvable problems that feature high complexity. On the other hand, cooperation among diverse participants can be inefficient if substantially new solutions need to be created to complement or network existing operant and operand resources. In other words, progressive business ideas co-innovated in data spaces reflect back on the participating organizations, requiring them to back-up the pace of their innovations by speeding up their digital transformation.

- **Involvement of physical objects that are digitally networked**: By ensuring transparency, security and privacy by design (i.e., following EU standards, GDPR), public data spaces might be better suited than commercial cloud platforms to involve data from objects that belong to the public or consumers, complementing objects owned by companies (e.g., machines). Thus, public data spaces may be a way to implement fair cooperation with consumers (beyond the data acquisition currently implemented by hyperscalers such as Google and Apple).
- **Governance structures:** Public data spaces rely on publicly provided infrastructures. While the advantages of the setup are known (e.g., usage control for data protection, security concepts, policies), actors might nonetheless be incentivized to shape the infrastructure to their advantage. Can some members of the data space become so influential that "shadow infrastructures" emerge? How can the governance structure of the ecosystem shape digital transformation of organizations and how are organizations evolving in response to the changing platform landscape? Can an ecosystem manage itself without a focal player?

All these aspects are driving the adaptation of transformation management in organizations. How should management adapt to these changes? How should digital transformation strategies be designed to account for the numerous and potentially conflicting interests of all parties involved?

Implications and future research areas

The literature on digital transformation has primarily taken a technology push–pull perspective, examining the impact of digital transformation efforts within the organization (Vial, 2019). In contrast, the provision of federated infrastructure in the form of public data spaces can have implications beyond the boundaries of organizations and is intended to foster innovations within ecosystems to improve economic and societal well-being (European Commission, 2020).

Public data spaces are promoted to guarantee data sovereignty to organizations by enabling control and optimization of data access, thus ensuring a secure, reliable, and transparent space for data access and exchange between different parties (Lis & Otto, 2020). In light of data being the key ingredient of technological advancements, such as Artificial Intelligence, autonomous driving, and smart online services, data spaces are provided to contribute to a fuller realization of the innovative potential of data. From a practical perspective, digital transformation managers interested in public data spaces must evaluate whether to invest in these data spaces. The question arises to what extent data spaces are valuable to their organizational endeavor and stakeholders (de Prieëlle et al., 2020). Answering such a question involves exploring several related questions, including: How do the strengths of the traditional commercial, private platforms compare against the strengths of public platform ecosystems? How do public data spaces create trust and transparency?

Beyond access to data, public data spaces foster the ecosystem's independence from strong monopolistic players (e.g., Microsoft, Google), which is seen as an advantage from a European perspective in terms of regulation and negotiation power (Kuebler-Wachendorff et al., 2021). There is a need to examine, for example, whether public data spaces, such as federated open data infrastructures, may interfere with the principles of the free-market economy. At the same time, will potential key strategic values of data spaces lead to even more profound winner-takes-all constellations than on commercial cloud platforms? (Sedlmeir et al., 2017). Thus, researchers could investigate: What role does the ownership structure play in facilitating digital transformation initiatives? What are the downsides of data spaces provided by public institutions?

Moreover, public data spaces provide promising opportunities for tackling societal challenges. They offer organizations the infrastructure to align interests and address complex societal issues, such as environmental sustainability, in a coordinated effort (Feroz et al., 2021). Specifically, public data spaces may provide a reliable and secure platform for connecting multiple data streams, including public sector data, to address challenges beyond pure economic benefit (European Commission, 2018). The pooling of data of the same type or complementary nature may enable organizations to co-create innovations that are not possible with the resources of a single organization (European Commission, 2020). Thus, these data ecosystems may fuel innovations by providing access to and use of data from other sources (e.g., environment or government data). Such data-driven innovations are needed, for example, for improving personal health care and new mobility solutions (European Commission, 2020). Thus, researchers could investigate: What factors can influence digital transformation efforts that bridge private and public interest in an innovative way? Should organizations disseminate their exclusive information to others, or will they lose their competitive edge by opening their data silos for increasingly data-driven innovations? (Kuebler-Wachendorff et al., 2021).

In summary, public data spaces create a new environment for organizations and have the potential to trigger and shape digital transformation. However, the details, as well as the advantages and disadvantages of their use, are yet unknown. This is an exciting opportunity for IS researchers seeking to contribute to a better understanding of

public data spaces by providing theory-based and empirical insights in this area. In Table 2, we present a set of research questions that we deem relevant in light of the emergence of public data spaces and hope that they inspire researchers aiming to investigate this relevant topic. The potential research questions address the different dimensions proposed in Fig. 1.

Overview of this special issue

This special issue aims to advance research in the digital transformation domain. Papers included in this special issue were selected and revised extensively from the work presented in the "Digital Transformation" track at the International Conference on Wirtschaftsinformatik, which took place in Siegen in February 2019 and in Potsdam in 2020. The special issue comprises five papers covering various aspects of digital transformation and providing initial insights into the issues associated with the emergence of public data spaces.

The initial set of two papers may be attributed to advancing the understanding of data in digital transformation efforts. The first paper in this issue, by Hunke, Heinz, and Satzger (Hunke et al., 2022), explores analytics-based services (ABS) as a means of creating customer value from data and analytics. The authors identify four distinct ABS archetypes that highlight the objectives providers pursue when offering such services, namely, 1) to make data usable to customers, 2) to deliver data-based insights, 3) to provide data-based recommendations, and 4) to enable novel ways to conduct business. The work highlights the importance of data as a key strategic resource and shows how companies are turning data and analytics into innovative, customer-facing and value-creating business opportunities. As such, it offers valuable insights into the opportunities for innovation and value creation based on the data and analytics solutions available today. The emergence of data spaces is expected to increase the amount and variety of available data and techniques to analyze them, creating new analytics-based service offerings. Therefore, further research is needed to identify and describe future data-driven innovations.

Barann, Betzing, Niemann, Hoffmeister, and Becker (Barann et al., 2022), in the second paper, focus on digital transformation in retail. They investigate the willingness of customers to use digital touchpoints in a physical retail store for activities such as product search, selection or information gathering. The work provides valuable insights into emerging data sources resulting from the increasing digitization of physical spaces such as retail stores. However, it also shows that customer acceptance of certain digital touchpoints limits the type of data a company can generate. Future research should investigate to what extent such data sources will open up new opportunities for retailers to participate in data spaces.

The next set of three papers may be attributed to advancing our knowledge of interorganizational collaboration for digital transformation. In the third paper, Jöhnk, Ollig, Rövekamp and Österle (Jöhnk et al., 2022) shed light on the organizational complexity that arises when companies

Table 2 Research questions

Focus areas	Selected research questions
Technologies & Systems	• What technical foundations are required to support data and application sharing in a secure and trusted manner? • How can organizations ensure the compatibility of their internal IT landscape with the data space infrastructure?
Data & Information	• How can organizations leverage data available through public data spaces for innovation and value creation? • Should companies share their exclusive information with others, or will they lose their competitive advantage if they open their data silos to increasingly data-driven innovation?
Participants & Capabilities	• What will interorganizational collaboration in data spaces look like to align internal and external stakeholders? • How should digital transformation strategies be designed to accommodate all stakeholders' multiple and potentially conflicting interests? • How can organizations manage the trade-off between innovation potential and complexity when participating in data spaces? • What capabilities do organizations need to harness the potential for innovation within public data spaces?
Structure & Processes	• What structures and processes allow organizations to manage the increasing complexity of digital transformation in light of data spaces?
Products & Services	• What innovations arise from the collaboration of organizations in data spaces? Does this produce solutions to pressing societal issues? • How can organizations build successful business models based on public data spaces?
Strategy & Governance	• How does the emergence of data spaces influence organizations' digital transformation strategy? • What are the risks and unintended consequences for organizations participating in public data spaces? • How do market dynamics change with the emergence of public data spaces? • How will organizations establish governance mechanisms to shape their interactions and co-innovation, and what will these mechanisms look like? • How can a fair distribution of profits be established?

initiate multiple digital transformation initiatives simultaneously and how companies deal with this complexity. The authors present insights from three case companies and show how these organizations manage the interplay of multiple digital transformation initiatives. The ability of organizations to manage the complexity of digital transformation is a prerequisite for the further (cross-domain) collaboration enabled by data spaces. In particular, as complexity will continue to increase as organizations collaborate and co-innovate in data spaces, we need future research that examines how companies can deal with this complexity internally.

Österle, Buchwald and Urbach (Österle et al., 2022), in the fourth paper, focus on collaboration between companies and external partners, specifically IT consultancies, to drive their digital transformation. Based on the Service-Dominant Logic, they examine how value is created in IT consulting projects and empirically demonstrate the determinants that contribute to the overall value of IT consulting services. Given the importance of cross-company collaboration in innovation projects using data spaces, the work provides valuable insights into how such collaborations can be investigated.

In the final paper in this issue, Pöppelbuss, Ebel and Anke (Pöppelbuss et al, 2022) adopt an ecosystem view and examine the interaction between multiple actors in smart service innovation processes. In doing so, they go beyond the single focal organization or the dyadic perspective of providers and customers. The study shows how multiple actors can jointly manage uncertainty in the innovation process and create novel data-driven service offerings. Given the interconnectedness of organizations in data spaces, an ecosystem perspective seems promising. The paper provides first insights into how organizations deal with complexity (i.e., more diverse, more interconnected actors increase complexity). Such insights are urgently needed in the context of data spaces, where organizations exchange and share data to create innovations that are not possible with the resources of a single organization.

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