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Data Governance for Creating Value in Data Ecosystems

Abstract: In the present work we review the literature on data ecosystems to expand the current understanding of data governance. We discuss how data ecosystem governance involves coordination among different actors regarding data, data activities and data realms. The presence of various actors, responsible and accountable for data along the data value chain, create complexity and interdependencies. Our argument serves as a basis for both practitioners and academics to rethink data ecosystem governance by offering insights into the dynamics of data ecosystems and ensuring that these ecosystems effectively create value from data.

Keywords: Data Ecosystem; Data Governance; Data Activities; Actors; Governance Mechanisms.

1. Introduction

In the contemporary digital landscape, data stands as a pivotal asset driving innovation, strategic decision-making, and economic growth across various sectors. As a single organization does not possess all the required capabilities and resources to create, collect, store, integrate, exchange, and process data, thus, there is an inherent reliance on other organizations' capabilities and resources (Oliveira and Lóscio 2018). This leads to inter-organizational data collaborations and the emergence of complex socio-technical networks around data known as data ecosystems (Basole 2020; Oliveira et al. 2019). The formation of data ecosystems in different industrial sectors and countries presents organizations with new challenges, especially in mitigating risks associated with data collaboration while enhancing the value of data. Despite the fact that the literature emphasizes the importance of procedures and controls to mitigate risk associated with data activities at the organizational level, little is known about how data activities at the ecosystem level need to be governed.

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Prior research reveals similarities and differences between governance at organizational and ecosystem levels (Scholz et al. 2022). Although the literature provides insights about data ecosystem governance, does not adequately address the inherent complexity and dynamics of data ecosystems.

This paper aims to advance the understanding of data ecosystem governance by shifting the focus towards data as digital artifacts and examining the data value chain to illustrate the distributed nature of data and its integration with various technologies and actors. Through a literature review, we explore the nuances of coordinating governance across different data realms and among diverse stakeholders within the ecosystem. Our goal is to expand our understanding by reflecting on the intricacies of data ecosystem governance and providing actionable insights for effective management of data in a collaborative environment.

The paper is organized as follows: the next section provides a overview of existing knowledge and frameworks relevant to data ecosystems and governance. Following the theoretical framework, the paper details the methodological approach employed in the study. The fourth section engages in a critical analysis of the current paradigms of data governance. It challenges existing models and proposes new perspectives to better accommodate the complexities and dynamism of modern data ecosystems. The concluding section synthesizes the findings from the discussion and exploration stages, drawing conclusions about the state of data ecosystem governance and its implications for both theoretical frameworks and practical applications.

2. Theoretical Background

2.1. Data Ecosystems

Data ecosystems are defined as "socio-technical complex networks in which actors interact and collaborate with each other to find, archive, publish, consume, or reuse data as well as to foster innovation, create value, and support new businesses"(Oliveira et al. 2019, p. 590). Data ecosystems create value by having one group of actors produce or provide data while other actors within the ecosystem consume it (Janssen et al. 2012).

The literature categorizes data ecosystems based on the governance structure as market, hierarchy, network and bazaar (Lis and Otto 2021). Data ecosystems can have different degrees of openness. In open data ecosystems, any actor can join the ecosystem and use data with no constraint. The primary goal of an open data ecosystem is to enhance transparency and support decision-making. Contrary, in closed data ecosystems, only certain actors have permission to access and use the data (Gelhaar et al. 2021; Janssen et al. 2012). Another distinction can be made based on infrastructure. Data ecosystems can rely on proprietary infrastructure managed and owned by an actor – for instance, social media platforms (Alaimo et al. 2019) – or on distributed infrastructure to store, process and exchange data (Gelhaar and Otto 2020).

2.2. Data Governance

Data Governance is defined as "a system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models which describe who can take what ac-tions with what information, and when, under what circumstances, using what methods"[1]. Literature on data governance focuses on the allocation of decision rights and the deployment of mechanisms to ensure the alignment of activities with organizational goals (Khatri and Brown 2010). Literature suggests different frameworks to ensure that data decisions are aligned with goals and objectives (Gregory et al. 2018; Tiwana et al. 2013) by identifying different roles within an organization (Abraham et al. 2019; Khatri and Brown 2010); for example, data governance leader, data owner, data producer, and the data consumer to name a few (Abraham et al. 2019; Jarvenpaa and Essén 2023).

The existing literature on data governance has mainly focused on the organizational level (Abraham et al. 2019): how an enterprise handles and uses its organizational assets. However, recently, scholars have seen a need for shifting the focus from the organizational to the ecosystem level as organizations increasingly rely on sharing and accessing data both within and outside the organizational boundaries (Abraham et al. 2019; Jagals and Karger 2021). The current frameworks although provide insights about data governance in inter-organizational context, do not fully address the challenges, complexity and dynamics that emerged from data collaboration and interactions of heterogeneous ecosystem actors (Lis and Otto 2020). Only recently, Micheli et al. (2020) empirically investigated and compared governance mechanisms among different data ecosystems.

Another research stream views data like other digital artifacts with peculiar characteristics and has ex-panded our understanding of data governance. For instance, Parmiggiani and Grisot (Parmiggiani and Grisot 2020) describe the importance of bottom-up decisions (rather than top-down) and the role of actors who actually work with data for data governance at the level. However, we know little about how data nature shapes data governance at the ecosystem level.

2.3. Data Value Chain

The Data Value Chain (DVC) outlines the progression of data from its initial collection to analysis, dissemination, and its ultimate influence on decision-making processes (Watch 2018). The concept organizes an organization's fundamental value-adding activities, enhancing understanding and optimization opportunities. A value chain comprises various subsystems, each involving inputs, transformation processes, and outputs. Rayport and Sviokla (1995)

1 https://datagovernance.com/the-data-governance-basics/definitions-of-data-governance/.

were pioneers in applying the value chain concept to information systems in their 1995 work on Virtual Value Chains. Integrating DVC within a smart environment enhances the performance of firms that recognize the critical importance of data (Mayhew et al. 2016). The DVC process, involves five stages (Cavanillas et al. 2016): data acquisition: this involves collecting, filtering, and cleaning data to produce an analyzable element for the data warehouse; data analysis: this stage includes exploring, transforming, and modeling data to render it strategically useful; data curation: this involves managing data to ensure it maintains the necessary quality throughout its lifecycle (Pennock 2007); data storage: data are efficiently grouped and stored in a scalable manner to facilitate quick and efficient access by relevant parties; data usage: this activity integrates data analysis into business processes through tools that support both the analysis and access to stored data.

The DVC is designed to model high-level activities within information systems, featuring more inter-connections than traditional value chains, and is central to the Data Ecosystem at a micro level, with numerous stakeholders at both meso and macro levels (Curry 2016). Contributions by Knabke & Olbrich (2015) and Mikalef & Gupta (2021) emphasize the role of dynamic capabilities in enhancing business intelligence and value, thereby enriching academic perspectives on how firms can adapt their roles and positions within the evolving big data and business analytics ecosystems. A robust analytics capability is essential for digital transformation, requiring organizations competing in the digital economy to invest in diverse resources such as personnel, processes, technologies, and organizational structure.

3. Research Method

The goal of the study is to develop a conceptual model for data ecosystem governance. To develop a conceptual model, we conducted a literature review (Webster and Watson 2002) of research on data governance and ecosystems. To identify relevant literature, we used AIS Electronic Library database for the searching phase. For key-based search, we used "data ecosystem*" as a keyword. Our analy-sis focused on governance in data ecosystems rather than data/information governance to ensure that our literature review provides new insights and expands the work of Abraham et al. (Abraham et al. 2019) and Scholz et al. (Scholz et al. 2022).

We conducted key-based search in May 2023. We also included peer-reviewed conference papers. In qualitative assessment, based on their titles and abstracts, we excluded articles that did not focus explicitly or implicitly on data governance or decisions about data management in data ecosystems. We also performed a forward and backward search to identify other relevant articles. In total, we reached 40 articles addressing data ecosystem governance.

During the analysis of the literature, key themes have emerged to delineate the focus of scholarly research on data, collectively enhancing our understand-

ing of different aspects of data governance. These themes include: (i) the concept of data as digital artifacts, (ii) the distribution of data tasks across various organizations, and (iii) the comprehensive areas encompassed by data realms. Specifically, these realms cover data quality, data value, data security and privacy, regulatory compliance, and data sustainability. Each of these components plays a crucial role in shaping the frameworks and strategies that govern the effective management and utilization of data in diverse contexts and they will be discussed in the next sections.

4. Discussion of results: Rethinking data ecosystem governance

With the formation and emergence of new data ecosystems, previous studies illustrate challenges in data governance regarding data rights, ownership, coordination, and incentive systems (Lis and Otto 2020; Susha et al. 2017). To show the complexity and dynamics of data ecosystems, we draw on the literature on digital artifacts and data value chain. This allows us to extend the scope of data governance by considering data not as organizational assets but as data objects (Kallinikos et al. 2013) which flow continuously across organizational and technological arrangements.

4.1. Data as Digital Artifacts

Data sources range from operational data, proprietary data, machine-generated data, user data on social media, open data to personal data. Data sources can be internal or external. Enterprise resource planning (ERP) systems, transactions, and organizational processes are some examples of internal data. External data are generated and aggregated outside of organizational boundaries such as third parties, user data and open data sources to name a few (Günther et al. 2017; Zuboff 2015).

The value of data changes over time (Pigni et al. 2016). Real-time data offers insights about instant events, allowing for agile decision-making (Pigni et al. 2016). Historical data are collected and stored over a longer period and are often used for trend analysis and strategic planning. Organizations can reuse data multiple times without data being consumed for different purposes (Constantiou and Kallinikos 2015; Günther et al. 2022; Newell and Marabelli 2015), due to their non-rival nature (Krämer 2020). Organizations use different types of data to draw insights from, ranging from raw data to data products (Hasan and Legner 2023). Data products are defined as "a managed artifact that satisfies recurring information needs and creates value through transforming and packaging relevant data elements into consumable form" (Hasan and Legner 2023). Data as other digital objects are self-referential (Kallinikos et al. 2013; Yoo et al. 2010). Consequently, data must use other digital technologies to create new insights from data. In other words, data creation, collection, storage, exchange, and process require digital technologies. For instance, a firm can use

data generated by users of its online services by relying on cloud services. Such technologies can be proprietary infrastructure managed and owned by an actor – for instance, social media platforms (Alaimo et al. 2019) – or distributed infrastructure to store, process and exchange data (Gelhaar and Otto 2020). A single actor may not necessarily possess all technologies (such as software and infrastructure) and thus relies on other actors' resources and capabilities for data processing and exchange (Assunção et al. 2015). Putting all these unique characteristics of data together, we need to expand the scope of data governance. First, to (re)combine data efficiently and effectively, data governance needs to focus on data formats and protocols to ensure the interoperability of data across different infrastructures. Data ecosystems could deploy guidelines and a shared framework (Kazemargi et al. 2023) specifying how data is to be shared in order to data facilitate data combination and (re)use.

Second, for data ecosystems to function and be sustained, data must be reused by different ecosystem actors. The ability to reuse data depends heavily on data governance. Data governance needs to control for what purposes data are used. In particular, data ecosystem governance involves defining policies and rules to determine what reuse purposes will be allowed in the ecosystem.

Third, controlling data resources needs to be another scope of data ecosystem governance. Since data flow across organizational boundaries and infrastructures, what infrastructures and applications are used for data creation, collection, storage, exchange, and processing data become relevant for data ecosystem governance.

4.2. Distributed Data Tasks

Considering the characteristics of digital data, organizations need to continuously make decisions around data access, data storage, data analysis for data-driven business models (Lange et al. 2021). This expands the scope of data ecosystem governance to include not only data as digital artifacts but also the alignment of data tasks with the overall strategy. For instance, decisions about revealing corporate data as open data (Enders et al. 2020) need to be aligned with a long-term organizational strategy. At the organizational level, the aim is to maximize the benefit of open data for an organization while limiting the negative consequences of open data. Such decisions have direct implications for value creation within an ecosystem.

Data tasks are interrelated. Decisions about data collection, curation and consumption (Basole 2020; Chua et al. 2022) influence data collaboration and consequently data-driven innovation. For instance, Parmiggiani and Grisot (2020) show that decisions related to data production and use influence data quality and consequently value generated by data. Within an ecosystem, data tasks are distributed among a diverse set of actors. For instance, Basole (2020) outlines some data are curated by different actors with different expertise and interests (e.g., crowd). Thus, data ecosystem governance should be seen as the effort to ensure the interests of the key stakeholders who own, provide and control plat-

forms and technology (2019), but also as the efforts to coordinate a diverse set of actors who use and share data. This is consistent with the work by Janssen et al. (2012) who argue that sustaining data ecosystems depends on the motivation and engagement of not only data providers but also data users.

Data ecosystem governance also should include not only what data to govern but also the data value chain: how data are created, collected, stored, exchanged, integrated, and processed. Governance over data tasks limits behavioral complexity, promotes fair use of data as collective resources, and addresses tensions among actors (van den Broek and van Veenstra 2018) to facilitate and promote data shar-ing (Lis and Otto 2021).

Previous studies also discuss data ecosystem governance needs to address also incentive structure (Tiwana et al. 2013), how to provide a structure and incentive to promote the participation of (new) actors generating, collecting, using, and exchanging data (Heinz et al. 2022; De Prieëlle et al. 2020).

4.3. Data Realms

Data ecosystems play a crucial role in shaping the digital landscape, demanding effective governance to optimize their potential and mitigate inherent risks. Within these ecosystems, several key elements – data quality, value, security, regulatory compliance, and sustainability – emerge as fundamental to their successful operation. High-quality data fuel accurate insights and superior decision-making, while the management of data security and privacy safeguards against potential violations and enhances trust among participants. Moreover, navigating the varying regulatory landscapes across different jurisdictions poses significant challenges, necessitating adaptive governance strategies that ensure compliance and facilitate long-term sustainability. As these ecosystems evolve, the need to balance diverse stakeholder interests, uphold data sovereignty, and sustainably manage data resources becomes ever more critical. This interplay of factors underpins the overarching frameworks and strategies that govern data ecosystems, ultimately influencing their efficacy and value generation. A description of the key elements follows:

Data Quality. Data quality influences the value that can be extracted from it: high-quality data enable more accurate insights and better decision-making. Data quality includes the integrity of data that organizations generate, collect, integrate, or curate (Basole 2020). In particular, evaluating the quality of open data is particularly important to ensure its accuracy and usefulness for various actors in a data ecosystem (Najafabadi and Cronemberger 2022). Evaluation of the quality of data requires a set of definitions, standards, and rules. While some organizations have adopted the organizational level standards, in data ecosystems, shared standards are needed. In the lack of shared standards for data quality, data ecosystems face the challenge of managing different data quality standards (Jarvenpaa and Essén 2023).

Data Value. Data ecosystem governance needs to address the interests and expectations of a diverse set of ecosystem actors (Lee et al. 2017; Scholz et al.

2022). This is a challenging task as these interests and expectations often differ and can sometimes conflict (Lauf et al. 2022). To sustain data ecosystems, data governance frameworks must incorporate data sovereignty[2], allowing stakeholders to negotiate and control the use of their data (Jarke et al. 2019). Another challenge in creating a sustainable data ecosystem is to ensure that all actors capture value, especially data owners. Thus, governance and the business model of data ecosystems are interrelated concepts.

Data Security/ Privacy. Enders et al. (2020) studied decisions related to data sharing and risks associated with releasing open data. Beyond carefully analyzing competitiveness and innovation opportunities, data security and privacy issues surface within data ecosystems as how one actor handles data may lead to a security/ privacy violation for other actors (Davidson et al. 2023; Newell and Marabelli 2015; Vial 2019)digital data are captured through a variety of devices that have the ability to monitor the minutiae of an individual's everyday life. These data are often processed by algorithms, which support (or drive. Thus, data ecosystems use a diverse set of governance mechanisms to mitigate security and privacy risks: for example guidelines, standards, contracts and bilateral agreements (Burmeister et al. 2021).

Regulatory Compliance. Data and data resources are managed by dispersed actors across industries and countries with different regulatory landscapes. In sectors with lax regulatory enforcement, regulatory compliance and norms are minimal, whereas highly regulated sectors require more adhesion to national and international regulations (Martin et al. 2019). Given the the complexity and evolution of the regulations coming into force, data ecosystem governance should therefore be aware of this and aim to resolve it (Kazemargi et al. 2023).

Data Sustainability. Deriving insights from historical and/or (re)combined data over time has given rise to data sustainability discussion. Data sustainability refers to the capacity to "data accumulation in the past and present is used to meet the needs of the present generation but without compromising the data's use in the future by heterogeneous, independent, and unknown actors" (Jarvenpaa and Essén 2023, p. 100449). Given the evolving technological and social arrangements, data sustainability is a crucial aspect of data ecosystem governance to ensure value creation in the long term by reusing and recombining data.

Conclusion

This study focused on the dynamics and the governance frameworks within data ecosystems. By embracing a perspective that views data not merely as organiza-

2 Data sovereignty refers to "the complete control over stored and processed data and the decision on who is permitted to have access to it". According to GAIA-X: Driver of digital innovation in Europe (2020).

tional assets but as dynamic digital artifacts that continuously interact across various boundaries, we uncover the complexity in data management and governance at the ecosystem level. Our research underscores the critical role of integrated data governance frameworks that align with the evolving nature of data ecosystems, marked by diverse actors and technologies.

Our contributions emphasize the importance of redefining data governance to encompass broader scopes – focusing not only on data protection and privacy but also on the strategic utilization of data through the data value chain. The proposed governance frameworks need to account for the continuous flow and reuse of data, ensuring interoperability, security, and sustainability. Such frameworks should also foster collaboration among ecosystem actors while balancing individual and collective goals, addressing inherent conflicts, and enhancing transparency and accountability. Moreover, by emphasizing the role of data as digital artifacts, the paper provides a novel perspective on how data is managed and utilized across different stages – from collection to usage. This integration can highlight the interconnectedness of data management processes and offer a holistic view that is often lacking in traditional data governance frameworks. This approach may lead to the development of more comprehensive governance strategies that address both the technical and organizational aspects of data ecosystems.

On a final note, by rethinking governance in light of the distributed nature of data and the multitude of actors involved, the paper emphasizes the importance of better coordination, transparency, and efficiency of data sharing and utilization. This is pivotal in managing the inherent risks and maximizing the value derived from data ecosystems. As data ecosystems continue to emerge and grow in complexity and significance, the insights derived from this study could serve as foundational guidelines for policymakers, industry leaders, and researchers. Future work should explore practical applications of these governance models in real-world settings and their impacts on innovation, efficiency, and the equitable distribution of data-driven benefits. This will not only refine theoretical models but also ensure that data ecosystems are leveraged effectively to foster sustainable growth and innovation across sectors.

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References

Abraham, R., Schneider, J., and vom Brocke, J. 2019. "Data Governance: A Conceptual Framework, Structured Review, and Research Agenda", in *International Journal of Information Management* (49:July), Elsevier, pp. 424-438. (https://doi.org/10.1016/j.ijinfomgt.2019.07.008).

Alaimo, C., Kallinikos, J., and Valderrama, E. 2019. "Platforms as Service Ecosystems: Lessons from Social Media", in *Journal of Information Technology*. (https://doi.org/10.1177/0268396219881462).

Assunção, M. D., Calheiros, R. N., Bianchi, S., Netto, M. A. S., and Buyya, R. 2015. "Big Data Computing and Clouds: Trends and Future Directions", in *Journal of Parallel and Distributed Computing* (79), Elsevier, pp. 3-15.

Basole, R. C. 2020. "Understanding Ecosystem Data", in *Proceedings of the Annual Hawaii International Conference on System Sciences* (2020-Janua), pp. 5718-5727. (https://doi.org/10.24251/hicss.2020.702).

Burmeister, F., Kurtz, C., Vogel, P., Drews, P., Schirmer, I., Burmeister, F., Vogel, P., Kurtz, C., Drews, P., and Schirmer, I. 2021. "Unraveling Privacy Concerns in Complex Data Ecosystems with Architectural Thinking," in *ICIS 2021 Proceedings*.

Cavanillas, J. M., Curry, E., and Wahlster, W. 2016. *New Horizons for a Data-Driven Economy: A Roadmap for Usage and Exploitation of Big Data in Europe*, Springer Nature.

Chua, C., Indulska, M., Lukyanenko, R., Montr, H. E. C., Maass, W., and Storey, V. C. 2022. *MISQ Research Curation on Data Management Research*, pp. 1-12.

Constantiou, I. D., and Kallinikos, J. 2015. "New Games, New Rules: Big Data and the Changing Context of Strategy," *Journal of Information Technology* (30:1), pp. 44-57. (https://doi.org/10.1057/jit.2014.17).

Curry, E. 2016. "The Big Data Value Chain: Definitions, Concepts, and Theoretical Approaches," *New Horizons for a Data-Driven Economy: A Roadmap for Usage and Exploitation of Big Data in Europe*, Springer International Publishing, pp. 29-37.

Davidson, E., Wessel, L., Winter, J. S., and Winter, S. 2023. "Future Directions for Scholarship on Data Governance, Digital Innovation, and Grand Challenges," *Information and Organization* (33:1), Elsevier Ltd, p. 100454. (https://doi.org/10.1016/j.infoandorg.2023.100454).

De Prieëlle, F., De Reuver, M., and Rezaei, J. 2020. "The Role of Ecosystem Data Governance in Adoption of Data Platforms by Internet-of-Things Data Providers: Case of Dutch Horticulture Industry," *IEEE Transactions on Engineering Management*, IEEE.

Enders, T., Wolff, C., and Satzger, G. 2020. "Knowing What to Share: Selective Revealing in Open Data," *ECIS 2020 – Proceedings of the 28th European Conference on Information Systems*.

Gelhaar, J., Groß, T., and Otto, B. 2021. "A Taxonomy for Data Ecosystems," *Proceedings of the Annual Hawaii International Conference on System Sciences* (2020-Janua), pp. 6113-6122. (https://doi.org/10.24251/hicss.2021.739).

Gelhaar, J., and Otto, B. 2020. "Challenges in the Emergence of Data Ecosystems," *Proceedings of the 24th Pacific Asia Conference on Information Systems*.

Gregory, R. W., Kaganer, E., Henfridsson, O., and Ruch, T. J. 2018. *IT Consumerization and the Transformation of IT Governance*, (42:4), pp. 1225-1253. (https://doi.org/10.25300/MISQ/2018/13703).

Günther, W. A., Rezazade Mehrizi, M. H., Huysman, M., Deken, F., and Feldberg, F. 2022. "Resourcing with Data: Unpacking the Process of Creating Data-Driven Value Propositions," *Journal of Strategic Information Systems* (31:4), Elsevier B.V., p. 101744. (https://doi.org/10.1016/j.jsis.2022.101744).

Günther, W. A., Rezazade Mehrizi, M. H., Huysman, M., and Feldberg, F. 2017. "Debating Big Data: A Literature Review on Realizing Value from Big Data," *Journal of Strategic Information Systems* (26:3), pp. 191-209. (https://doi.org/10.1016/j.jsis.2017.07.003).

Hasan, M. R., and Legner, C. 2023. "Understanding Data Products: Motivations, Definition, and Categories and Categories," *Ecis*, pp. 5-11. (https://aisel.aisnet.org/ecis2023_rp/229).

Heinz, D., Benz, C., Fassnacht, M., and Satzger, G. 2022. "Past, Present and Future of Data Ecosystems Research: A Systematic Literature Review," *PACIS 2022 Proceedings*. (https://aisel.aisnet.org/pacis2022).

Jagals, M., and Karger, E. 2021. "Inter-Organisational Data Governance: A Literature Review," *ECIS 2021 Research Papers* (June), pp. 1-19. (https://aisel.aisnet.org/ecis2021_rp/57).

Janssen, M., Charalabidis, Y., and Zuiderwijk, A. 2012. "Benefits, Adoption Barriers and Myths of Open Data and Open Government," *Information Systems Management* (29:4), pp. 258-268.

Jarke, M., Otto, B., and Ram, S. 2019. "Data Sovereignty and Data Space Ecosystems," *Business and Information Systems Engineering* (61:5), Springer Fachmedien Wiesbaden, pp. 549-550. (https://doi.org/10.1007/s12599-019-00614-2).

Jarvenpaa, S. L., and Essén, A. 2023. "Data Sustainability: Data Governance in Data Infrastructures across Technological and Human Generations," *Information and Organization* (33:1). (https://doi.org/10.1016/j.infoandorg.2023.100449).

Kallinikos, J., Aaltonen, A., and Marton, A. 2013. "THE AMBIVALENT ONTOLOGY OF DIGITAL ARTIFACTS," *MIS Quarterly* (37:2), pp. 357-370.

Kazemargi, N., Spagnoletti, P., Constantinides, P., and Prencipe, A. 2023. "Data Control Coordination in Cloud-Based Ecosystems: The EU GAIA-X Ecosystem," in *Research Handbook on Digital Strategy*, & F. Z. C. Cennamo, G. B. Dagnino (ed.), Edward Elgar Publishing, pp. 289-307. (https://doi.org/10.4337/9781800378902.00024).

Khatri, V., and Brown, C. V. 2010. "Designing Data Governance," *Communications of the ACM* (53:1), pp. 148-152. (https://doi.org/10.1145/1629175.1629210).

Knabke, T., and Olbrich, S. 2015. *Exploring the Future Shape of Business Intelligence: Mapping Dynamic Capabilities of Information Systems to Business Intelligence Agility*.

Krämer, J. 2020. "Personal Data Portability In The Platform Economy: Economic Implications And Policy Recommendations," *Journal of Competition Law & Economics* (17:2), pp. 263-308. (https://doi.org/10.1093/joclec/nhaa030).

Lange, H. E., Drews, P., and Höft, M. 2021. "Realization of Data-Driven Business Models in Incumbent Companies: An Exploratory Study Based on the Resource-Based View," *ICIS 2021 Proceedings*, pp. 1-17.

Lauf, F., Scheider, S., and Bartsch, J. 2022. "Linking Data Sovereignty and Data Economy : Arising Areas of Tension," in *Wirtschaftsinformatik 2022 Proceedings*.

Lee, S. U., Zhu, L., and Jeffery, R. 2017. "Data Governance for Platform Ecosystems: Critical Factors and the State of Practice," in *Pacific Asia Conference on Information Systems*.

Lis, D., and Otto, B. 2020. "Data Governance in Data Ecosystems – Insights from Organizations," in *AMCIS 2020 Proceedings.*

Lis, D., and Otto, B. 2021. "Towards a Taxonomy of Ecosystem Data Governance," *Proceedings of the Annual Hawaii International Conference on System Sciences* (2020-Janua), pp. 6067-6076. (https://doi.org/10.24251/hicss.2021.733).

Martin, N., Matt, C., Niebel, C., and Blind, K. 2019. "How Data Protection Regulation Affects Startup Innovation," *Information Systems Frontiers* (21:6), Information Systems Frontiers, pp. 1307-1324. (https://doi.org/10.1007/s10796-019-09974-2).

Mayhew, H., Saleh, T., and Williams, S. 2016. "Making Data Analytics Work for You—Instead of the Other Way Around," *McKinsey Quarterly* (4), pp. 1-8.

Micheli, M., Ponti, M., Craglia, M., and Berti Suman, A. 2020. "Emerging Models of Data Governance in the Age of Datafication," *Big Data and Society* (7:2). (https://doi.org/10.1177/2053951720948087).

Mikalef, P., and Gupta, M. 2021. "Artificial Intelligence Capability: Conceptualization, Measurement Calibration, and Empirical Study on Its Impact on Organizational Creativity and Firm Performance," *Information and Management* (58:3), Elsevier B.V., p. 103434. (https://doi.org/10.1016/j.im.2021.103434).

Najafabadi, M. M., and Cronemberger, F. A. 2022. "Systemic Effects of an Open Government Program on Data Quality: The Case of the New York State's Food Protection Program Area," *Transforming Government: People, Process and Policy*. (https://doi.org/10.1108/TG-11-2021-0194).

Newell, S., and Marabelli, M. 2015. "Strategic Opportunities (and Challenges) of Algorithmic Decision-Making: A Call for Action on the Long-Term Societal Effects of 'Datification,'" *Journal of Strategic Information Systems* (24:1), Elsevier B.V., pp. 3-14. (https://doi.org/10.1016/j.jsis.2015.02.001).

Oliveira, M. I. S., and Lóscio, B. F. 2018. "What Is a Data Ecosystem?," *ACM International Conference Proceeding Series*. (https://doi.org/10.1145/3209281.3209335).

Oliveira, M. I. S., Lóscio, B. F., and Lima, G. de F. B. 2019. "Investigations into Data Ecosystems: A Systematic Mapping Study," *Knowledge and Information Systems* (Vol. 61), Springer London. (https://doi.org/10.1007/s10115-018-1323-6).

Otto, B., and Jarke, M. 2019. "Designing a Multi-Sided Data Platform: Findings from the International Data Spaces Case," *Electronic Markets* (29:4), pp. 561-580. (https://doi.org/10.1007/s12525-019-00362-x).

Parmiggiani, E., and Grisot, M. 2020. "Data Curation as Governance Practice," *Scandinavian Journal of Information Systems* (32:1), pp. 1-38.

Pennock, M. 2007. "Digital Curation: A Life-Cycle Approach to Managing and Preserving Usable Digital Information," *Library & Archives* (1:1), n, pp. 1-3.

Pigni, F., Piccoli, G., and Watson, R. 2016. "Digital Data Streams: Creating Value from the Real-Time Flow of Big Data," *California Management Review* (58:3), pp. 5-25. (https://doi.org/10.1525/cmr.2016.58.3.5).

Rayport, J. F., & Sviokla, J. J. 1995. "Exploiting the Virtual Value Chain," *Harward Review., Buisness*, Boston.

Scholz, N., Wieland, J., and Schäffer, T. 2022. "Towards a Framework for Enterprise & Platform Ecosystem Data," in *AMCIS 2022 Proceedings*.

Susha, I., Janssen, M., and Verhulst, S. 2017. "Data Collaboratives as a New Frontier of Cross-Sector Partnerships in the Age of Open Data: Taxonomy Development," *Proceedings of the Annual Hawaii International Conference on System Sciences* (2017-Janua), pp. 2691-2700. (https://doi.org/10.24251/hicss.2017.325).

Tiwana, A., Konsynski, B., and Venkatraman, N. 2013. "Information Technology and Organizational Governance: The IT Governance Cube," *Journal of Management Information Systems* (30:3), Taylor & Francis, pp. 7-12.

van den Broek, T., and van Veenstra, A. F. 2018. "Governance of Big Data Collaborations: How to Balance Regulatory Compliance and Disruptive Innovation," *Technological Forecasting and Social Change* (129), Elsevier, pp. 330-338. (https://doi.org/10.1016/j.techfore.2017.09.040).

Vial, G. 2019. "Understanding Digital Transformation: A Review and a Research Agenda," *Journal of Strategic Information Systems* (28:2), Elsevier, pp. 118-144. (https://doi.org/10.1016/j.jsis.2019.01.003).

Watch, O. D. 2018. "The Data Value Chain: Moving from Production to Impact," *Data2X. Https://Opendatawatch. Com/Publications/the-Data-Value-Chain-Moving-from-pro Duction-to-Impact*.

Webster, J., and Watson, R. T. 2002. "Analyzing the Past to Prepare for the Future: Writing a Literature Review," *MIS Quarterly*, JSTOR, xiii–xxiii.

Yoo, Y., Henfridsson, O., and Lyytinen, K. 2010. "The New Organizing Logic of Digital Innovation: An Agenda for Information Systems Research," *Information Systems Research* (21:4), pp. 724-735. (https://doi.org/10.1287/isre.1100.0322).

Zuboff, S. 2015. "Big Other: Surveillance Capitalism and the Prospects of an Information Civilization," *Journal of Information Technology* (30:1), Springer, pp. 75-89.