Editorial

Editorial to the Special Issue on "Management of Data Ecosystems and Platforms"

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In the digital economy, data are widely acknowledged as strategic resources that generate business value. Data-driven innovation, however, is less and less created by one single organization or along the traditional value chain, but rather takes place in ecosystems that comprise a variety of actors (among them public institutions, enterprises, and individuals). At the core of these emerging data ecosystems are data platforms that allow to share, combine, enrich and analyze data from multiple parties with the goal of creating innovative services and improving coordination (Oliveira and Farias Lóscio, 2018). The importance of data ecosystems and platforms for addressing societal and business challenges is increasingly acknowledged by policy makers, practitioners, and academics. With the European Data Strategy and far-reaching regulations, such as the EU Data Act, the European Commission aims at stimulating innovation on data and facilitating the sharing of data, such as data held by manufacturers of IoT objects. The numerous benefits of data sharing, such as generation of new products and services, or reduction of public services' costs, are estimated at 270 billion Euros in additional GDP by 2028 (European Commission, 2020). As consequence, many European countries support the creation of data spaces in strategic areas such as mobility, health or energy, while firms form alliances that establish platforms for data sharing (Otto and Jarke, 2019).

Research on data ecosystems is still in its infancy and is carried out by scholars taking different disciplinary perspectives, such as management, law, information systems and computer science. On the technical side, research activities focus on designing cloud-based, federated data infrastructures and on integrating mechanisms that promote data sovereignty of the data holders and trust among all participants (Otto 2022). From the perspective of management research, data ecosystems represent a specific form of digital business ecosystems, and thereby further emphasize the inter-organizational lens in management research (Müller-Stevens and Stonig, 2019). However, data ecosystems come with their specific characteristics and dynamics, due to the unique properties of data as non-rivalrous, non-fungible experience good.

First, data ecosystems introduce novel ways of value creation from data. They differ from traditional data exchanges where organizations share data vertically with other actors of the value chain (for instance, a supplier with wholesalers and retailers). The emerging data ecosystems aim at sharing complementary data assets with others, including sometimes their competitors, in order to develop new value propositions and innovative or transformative solutions (Wixom, Sebastian and Gregory, 2020). Examples can be found when it comes to sharing data for anticipating and preparing for health emergencies, as in the recent Corona virus case, or digital twins that combine data from different providers and sources to trace the life-cycle of high-value assets or customer journeys in real-time.

Second, data ecosystems and the underlying data platforms share the key characteristics of multi-sided platforms and must be designed in a way to attain critical mass. This implies finding a viable balance between the interests of the individual data providers on the one hand and those of the ecosystem community on the other hand. Data providers are concerned about data sovereignty and transparency regarding the use of their data by other parties in the ecosystem. Since high quality data comes at a cost, data providers are not willing to give away their data for free. They expect a return in form of money or, very much often, of data of equal value. Furthermore, data providers fear the loss of company secrets when sharing data.

Furthermore, data ecosystems should favor federated and distributed platform designs to avoid situations in which control over data and data governance remains in the hands of one player in the market. Monopolistic developments as they are known from consumer platforms (sometimes referred to as the "winner takes it all" effect) are risky when critical and valuable data is shared by different actors and when high innovation and value opportunities are given in ecosystems. As consequence, platform design should avoid "centers of gravity" regarding platform control and data accumulation. There is a tendency to use federated and distributed platform designs. As mentioned above, data spaces represent a distributed data integration architecture which do not require a central data store but achieve integration mainly on semantic level and exchange data only on-demand on a trusted basis (Otto and Jarke, 2019). In a similar vein, much attention has been given to blockchain and distributed ledger architectures which ensure trust by avoiding the "man in the middle" situation.

Given the complex nature of the issue at hand, it is not surprising that research on data ecosystems benefits from different disciplinary perspectives to advance our understanding of the emerging data ecosystems and platforms. This special issue comprises two articles that address topics at the intersection between management and information systems research and help organizations navigate through these upcoming developments:

The first article by Tim Brée, Marvin Jagals and Erik Karger, from the University of Duisburg-Essen, starts from the observation that only few companies are operating in data ecosystems. Based on a literature review and expert interviews, the authors propose organizational readiness factors for joining and participating in data ecosystems. They specifically draw the attention to the legal foundation, top management support, and stakeholder involvement in data ecosystems, but also show that organizational readiness depends on a variety of contextual, organizational, and technical factors.

The second article by Ingrid Bauer and Gerhard Schwabe, from the University of Zurich, studies how value can be captured from tokenized asset histories. Building on the Carfile blockchain platform which provides a comprehensive car history certificate,

the authors propose and evaluate two designs for offering and pricing tokenized car histories. Based on experiments using market games, they find that the decentralized, seller-controlled design leads to higher revenues than the platform-controlled design. The findings are of interest for understanding how tokenized histories for high-value assets could be offered and priced to achieve long-term sustainable revenue for their use.

References

European Commission (2020). A European Strategy for data. Available at: https://digital-strategy.ec.europa.eu/en/policies/strategy-data (Accessed: 1 October 2022).

Müller-Stevens, Günther, and Stonig, Jürgen (2019). Editorial zum Themenheft «Unternehmens-Ökosysteme». In: Die Unternehmung: Swiss Journal of Business Research and Practice, 73(4), 285–287. https://www.jstor.org/stable/26995446

Oliveira, Marcelo Iury S., and Farias Lóscio, Bernadette (2018). What is a Data Ecosystem?. In: Proceedings of the 19th Annual International Conference on Digital Government Research, May 30-June 1, 2018. https://doi.org/10.1145/3209281.3209335

Otto, Boris, and Jarke, Matthias (2019). Designing a multi-sided data platform: findings from the International Data Spaces case. Electronic Markets 29, 561–580. https://doi.org/10.1007/s12525-019-00362-x

Otto, Boris (2022). A Federated Infrastructure for European Data Spaces. Communications of the ACM, 65(4), 44–45. https://cacm.acm.org/magazines/2022/4/259403-a-federated-infrastructure-for-european-data-spaces/fulltext

Wixom, Barbara, Sebastian, Ina, and Gregory, Rorbert Wayne (2020). Data Sharing 2.0: New Data Sharing, New Value Creation. *MIT CISR* Research Briefings. Available at: https://cisr.mit.edu/publication/2020_1001_DataSharing_WixomSebastianGregory (Accessed: 10 January 2023).

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