Business ecosystems 2.0 – built on data

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Business ecosystems have once again captured the attention of C-level executives. The utilization of an ecological metaphor to depict competition and coordination in business gained momentum in the early 1990s. Now, digital technology has caught up with theory, enabling scalable implementations. Specifically, cross-organizational data sharing using dataspace technology has emerged as a critical ecosystem enabler, much like how better data has enabled game-changing artificial intelligence such as ChatGPT, which would not exist without relevant and rich training data.

What is it?

A business ecosystem is a dynamic network of interconnected organizations, individuals, and other stakeholders that jointly contribute to the creation and delivery of value in a particular industry or market:

- "An **economic community** supported by a foundation of **interacting organizations** and individuals. [It] produces goods and services of value to customers, who are themselves members of the ecosystem. The member organisms also include suppliers, lead producers, competitors, and other stakeholders" (Moore 1996).
- "In a business ecosystem, companies **coevolve capabilities** around a new innovation: they work **cooperatively** to support new products, satisfy customer needs, and eventually incorporate the next round of innovations" (Moore 1993, 76).
- "The ecosystem also comprises entities like **regulatory agencies** and **media outlets** that can have a less immediate, but just as powerful, effect on your business […]. **Keystone organizations** play a crucial role in business ecosystem […] providing a stable and predictable set of **common assets** – think Wal-Mart's procurement system and Microsoft's Windows operation system and tools" (Iansiti & Levien 2004).
- "**Loosely coupled networks** […] larger, more **diverse**, and more **fluid** than a traditional set of bilateral partnerships" (Williamson & De Meyer 2012, 24)

Why important? 1 +1 = 3

Creating and navigating business ecosystems is increasingly viewed as essential for companies, as they enable strategic adaptation to rapidly changing markets, foster innovation through partnerships, and open up new business opportunities on a global scale. Central to this concept is the recognition that value creation can no longer occur in isolation — even competitors need to collaborate to achieve synergistic outcomes that surpass the

sum of their individual contributions (1 from you + 1 from your partners = 3). These outcomes may result in **best-of-breed** solutions that leapfrog existing offerings or unlock **"blue ocean"** opportunities, previously untapped or uncontested market spaces (Kim & Mauborgne 2004) that would have been inaccessible to any single player.

Specifically, business ecosystems are seen as contributing to a company's revenue and profits by offering collaborative opportunities beyond relying solely on internal capital or debt, in order to expand market reach, reduce cost through shared resources and capabilities, foster innovation, enhance customer satisfaction, and support faster adaptation to industry trends.

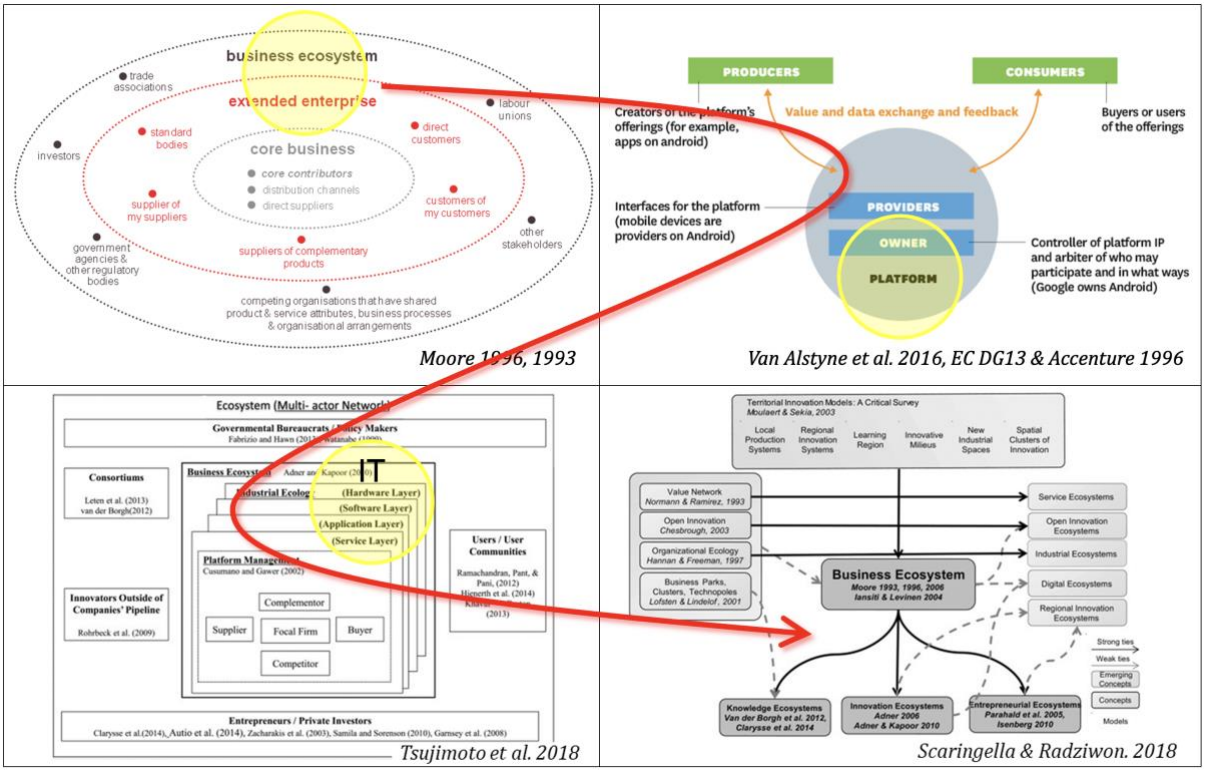

Figure 1: Evolution of business ecosystem conceptualization

3 waves: 1990s, 2000s, now

Co-opetition. The literature on business ecosystems has progressed since Moore's foundational work in the 1990s, highlighting the interconnectedness of entities within industries. Early on, this concept was broadened through the introduction of "co-opetition," a **game theory**-based perspective that explores how firms can simultaneously cooperate and compete within these ecosystems (Brandenburger & Nalebuff 1996).

Platforms. Further evolution occurred with exploration of platforms, emphasizing the strategic significance of platform-based business models and the role of **orchestrators** in shaping ecosystems. (Figure 1 illustrates the evolution of the concept from the upper left corner to low right quadrant).

- "Platform businesses bring together producers and consumers in **high-value exchanges**. Their chief assets are **information and interactions**. [They] connect

participants in a **2-sided market** […] generating value for both [sides]. As the number of participants [grows] that value [increases through] a phenomenon called **network effects**" (Van Alstyne et al. 2016 and "U-Model" in EC 1996, Fig. 12, page 15).

- Becoming a platform play "involves 3 key shifts (Van Alstyne et al. 2016):
    1. From resource control to resource **orchestration**
    2. From internal optimization to **external interaction**
    3. From focus on customer to focus on **ecosystem value**"
- While platform strategy is conceptually elegant, its practical management—especially under the mantra that "what gets measured gets managed"—often requires mathematically complex quantifications to capture nonlinear dynamics such as network effects and indirect value creation, exceeding intuitive tracking and traditional metrics, as underscored by Roche & Tirole, for example (2003)

Role of technology. With digital platforms the role of information technology (IT; field of information systems or IS in management science) is recognized as a key enabler (Adner & Kapoor 2010; see Figure 1, lower left quadrant by Tsujimoto et al. 2018, for example). This perspective corresponds with early research into "relation value", value generated across organizational relationships, enabled by IS capabilities, such as knowledge sharing or operational linkages for business advantage (Saraf et al. 2013, 2007). IT has also been applied to ecosystem strategy and business planning. Specifically, computational simulation has been used to go beyond traditional qualitative and algorithmic approaches, addressing analytically intractable problems arising from complex interactions—such as moves and countermoves—that exceed the capabilities of traditional game-theoretic analysis (see SIM 1: Simulation – From Impossible to probable – Compendium).

Digital: Data or die!

In the realm of digital business, data has evolved into a factor of production, comparable to traditional elements like labor and capital. Illustratively, in 2020, China's National Development and Reform Commission (NDRC) asserted that "new production factors such as data have a multiplier effect on the efficiency of other factors" (Shijia & Jia 2020). Early management innovators, such as Peter Drucker, underscored the importance of 'data as information's ore' (Drucker 1992), as raw material and fundamental ingredient for informed decision-making. Within the digital business landscape this concept has gained renewed prominence, as evidenced by the widely embraced analogy of 'data as the new oil' (attributed to Humby in Arthur 2013). Notably, generative AI models like ChatGPT exemplify this principle, wherein the quality of outcomes is contingent upon the quality of the training data. Recently, novel dataspace technology has emerged as a game-changer because it enables data sharing with data sovereignty protection, facilitating cross-organizational data sharing. This, in turn, makes better, more relevant, and richer data available within ecosystems, ultimately resulting in more productive business applications within an ecosystem than outside of it.

What is a dataspace?

A dataspace is a peer-to-peer data communication system (think: phone system for data or data dial-tone network) and not a storage solution, which sits on top of cloud platforms, with the advantage of cross-organizational data sharing with built-in data sovereignty protection: two parties who may not trust each other fully can trust a data transaction, because the party providing data retains power to control rights to it at all times through (a) verified authentication of users (who is involved?), (b) access control (who can see data offer?), and (c) usage policies, which are specified by the provider and need to be accepted and signed by the consumer (what is allowed?)" (see Schlueter Langdon & Schweichhart 2022). It resembles a "container shipping system" for data. A container protects what is inside and works everywhere, on sea and land, and ports around the world. What you place in it and to whom you send it for what purpose is between you and the receiver.

Case studies

For first dataspace case studies with use cases such **intermodal travel planning** and **CO2 emssion or product carbon footprint tracking**, please visit our Drucker Customer Lab page on "Dataspaces 101": https://research.cgu.edu/drucker-customer-lab/dataspaces-101/

Lessons learned: How to get ready?

Based on our synopsis of early dataspace case studies and involvement in Gaia-X lighthouse projects, such as Catena-X[1] and Gaia-X 4 Future Mobility (GX4FM)[2] (Gaia-X 2023), first 'recipes' for success with pilots, prototyping, and commercial projects have emerged. Please contact the principle investigator of our Dataspace 4 Ecosystems reseach: chris.langdon@cgu.edu

References

Adner, R., and R. Kapoor. 2010. Value Creation in Innovation Ecosystems: How the Structure of Technological Interdependence Affects Firm Performance in New Technology Generations. Strategic Management Journal 31(3): 306–333

Arthur, C. 2013. Tech giants may be huge, but nothing matches big data. The Guardian (2013-08-23), link

Brandenburger, A. M., and B. J. Nalebuff. 1996. *Co-opetition.* Currency/Doubleday: New York, NY.

[1] Professor Chris Schlueter Langdon is SAFe PM-PO certified (link), and in his role with Deutsche Telekom he has been one of three Agile Product Managers responsible for the Catena-X software release made available as free and open-source (FOSS) software under the Eclipse Foundation in the Tractus-X project, link

[2] Prof Langdon is also for Deutsche Telekom a consortial lead of one of the six GX4FM projects.

Drucker, P. 1992. Be Data Literate – Know What to Know. The Wall Street Journal (1992-12-03), link

European Commission DG XIII/E, and Andersen Consulting. 1996. Strategic Developments for the European Publishing Industry towards the Year 2000: Europe's Multimedia Challenge. Brussels–Luxembourg, link

Gaia-X. 2023. Lighthouse Projects - Making strides in navigating digital transformation with lighthouse projects. Gaia-X European Association for Data and Cloud AISBL, Bruxelles, link (2-pager, link)

Iansiti, M., and R. Levien. 2004. Strategy as Ecology. Harvard Business Review (March) (reprint)

Moore, J. F. 1993. Predators and prey: A new ecology of competition. Harvard Business Review (May–June): 75–86

Moore, J. F. 1996. The Death of Competition. HarperCollins: New York, NY

Rochet, J.-C., and J. Tirole. 2003. Platform Competition in Two-Sided Markets. Journal of the European Economic Association 1(4): 990-1029

Saraf, N, C. Schlueter Langdon, and O. El Sawy. 2013. IS Integration and Knowledge Sharing in Multi-unit Firms: The Winner's Curse. European Journal of Information Systems 22 (July): 592-603

Saraf, N., C. Schlueter Langdon, and S. Gosain. 2007. IS Application Capabilities and Relational Value in Inter-Firm Partnerships. Information Systems Research 18(3) (September): 320-339

Scaringella, L., and A. Radziwon. 2018. Innovation, entrepreneurial, knowledge, and business ecosystems: Old wine in new bottles? Technological Forecasting and Social Change, Volume 136 (November): 59-87, https://www.sciencedirect.com/science/article/pii/S0040162517312660

Shijia, O. and C. Jia. 2020. New guideline to better allocate production factors. China Daily (2020-04-10), link

Tsujimoto, M., Y. Kajikawa, J. Tomita, and Y. Matsumoto. 2018. A review of the ecosystem concept - Towards coherent ecosystem design. Technological Forecasting and Social Change, Volume 136 (November): 49-58, https://www.sciencedirect.com/science/article/pii/S004016251730879X

Van Alstyne, M.W., G.G. Parker, and S.P. Choudary. 2016. Pipelines, Platforms, and the New Rules of Strategy. Harvard Business Review (April): 54-60, link

Williamson, P.J., and A. De Meyer. 2012. Ecosystem Advantage: How to Successfully Harness the Power of Partners. California Management Review 55(1): 24-46