

# 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

Understanding and navigating business ecosystems is seen as vital for firms as they enable strategic adaptation to ever faster market changes, innovation through partnerships, and the identification of new business opportunities globally. Central to this concept is the recognition that value creation is not achievable in isolation, and the outcomes can be synergistic, surpassing the sum of its parts (1 from you + 1 from your partners = 3), and can

present a “blue ocean” opportunity, a yet unexploited or uncontested marketplace (Kim & Mauborgne 2004). Specifically, business ecosystems are seen as contributing to a company's revenue and profits by offering collaborative opportunities, expanding market reach, reducing costs (share resources and capabilities), fostering innovation, enhancing customer satisfaction, and facilitating faster adaptation to industry trends.

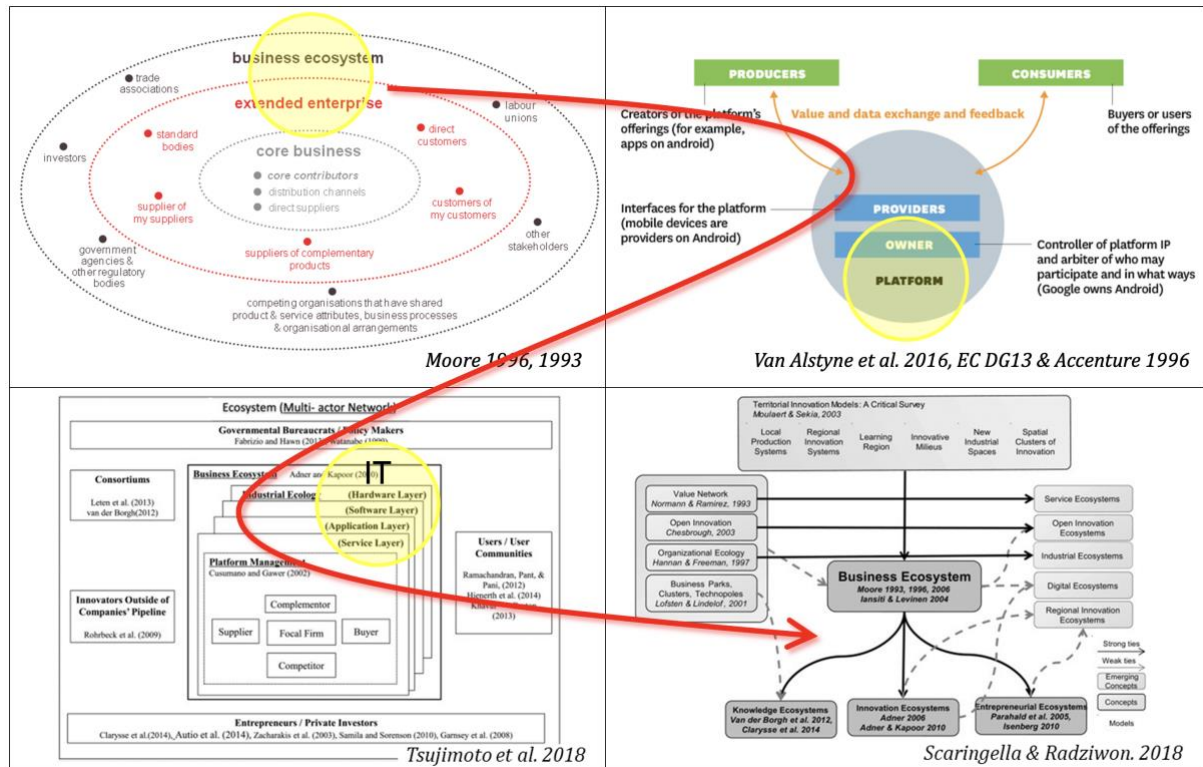


Figure 1: Evolution of business ecosystem conceptualization

### 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; see Ref section for 2-sided markets and network effects)

- Becoming a platform play “involves 3 key shifts:
  1. From resource control to resource **orchestration**
  2. From internal optimization to **external interaction**
  3. From focus on customer to focus on **ecosystem value**” (Van Alstyne et al. 2016)

**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 (Saraf et al. 2013, 2007).

## 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 emission or product carbon footprint tracking**, please visit our Drucker Customer Lab page on “Dataspace 101”: <https://research.cgu.edu/drucker-customer-lab/dataspace-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<sup>1</sup> and Gaia-X 4 Future Mobility (GX4FM)<sup>2</sup> (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 research: [chris.langdon@cgu.edu](mailto:chris.langdon@cgu.edu)

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<sup>1</sup> 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](#)

<sup>2</sup> Prof Langdon is also for Deutsche Telekom a consortial lead of one of the five GX4FM projects.

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