

STRATEGY

Achieving Operational Excellence Through Intelligent and Interactive Ecosystems

by Annika Steiber and J. Mark Munoz



Image Credit | lucegrafiar

Companies need to create better digital business ecosystems to gain operational excellence and competitive advantage.

Artificial Intelligence (AI) and digital transformation in organizations, has reconfigured organizational structures and led to a closer examination of intelligent and interactive ecosystems (commonly called Digital Business Ecosystems, or DBE) and its impact on firm operations and profitability. These ecosystems, driven by AI and data, has resulted in a significant paradigm shift in ways companies operate, innovate, and create value. This article examines how large companies have utilized and leveraged this kind of ecosystem, to gain operational excellence and a competitive edge in a digital age.

RELATED CMR ARTICLES

“Digital Platform Grafting: Strategies for Entering Established Ecosystems”, by Marcus Holgersson, Joakim Björkdahl, and David J. Teece, 66/3 (Spring 2024): 27-46.

“How Can Large Manufacturers Digitalize Their Business Models? A Framework for Orchestrating Industrial Ecosystems”, by David Sjödin, Vinit Parida, and Ivanka Visnjic, 64/3 (Spring 2022): 49-77.

Understanding the Digital Business Ecosystem Model

A DBE is an organizational form that collaborates to co-create and evolve capabilities using shared, cross-industrial technologies, knowledge, and skills. This specific organizational form sets the foundation for enhanced organizational collaboration, effective and nimble competitive responses, and accelerated customer-driven innovation. Research studies

highlight the importance of utilizing DBEs to innovate and gain operational efficiencies. The research highlights several fundamental characteristics that underpin the effectiveness of these ecosystems.

The Digital Business Ecosystem Model is characterized by three (3) key attributes:

Effective Platforms – Platforms set the tools and infrastructure that help participants connect, collaborate, and create value. These digital platforms facilitate seamless integration and interoperability within the ecosystem. Data, as the central asset of DBEs, is strategically leveraged by companies to make informed decisions, uncover insights, and fuel innovation. Effective data utilization enables personalized services and enhances customer experiences. Moreover, AI and machine learning technologies play a pivotal role in generating critical insights and providing competitive advantages in DBEs. By processing vast amounts of data, AI can identify patterns, predict trends, and optimize operations, leading to more efficient and effective business processes. This technological synergy is a cornerstone of digital transformation, transitioning traditional business models into innovative frameworks that unlock new ways to deliver value to customers.

Customer Focus – A key objective of DBEs is to harness data-driven insights and AI-powered solutions to deliver personalized services and elevate customer experiences, keeping the customer at the core of operations. The flexible nature of DBEs allows businesses to quickly adapt to market shifts and evolving customer needs, promoting ongoing innovation and supporting long-term sustainability.

Value Creation Through Collaboration – Operational improvements are achieved through inter- and intra-organizational collaboration and knowledge sharing to generate value. This cooperative model strengthens the overall value proposition and fosters lasting partnerships. Within DBEs, cross-industry and cross-functional collaboration unite a diverse array of stakeholders to create innovative solutions and expand market reach. Seamless connectivity and data sharing, crucial to DBE success, enable participants to integrate their systems and collaborate effectively. Openness and interoperability are essential for these collaborations to thrive. Additionally, maintaining strong data

protection and regulatory compliance is critical to upholding trust and ecosystem integrity. Ensuring data privacy and security is a core principle of DBEs, reflecting their commitment to safeguarding sensitive information while promoting innovation and collaboration.

These three attributes can enhance business operations in significant ways and sets the stage for the creation of competitive advantages.

Digital Business Ecosystems in Practice

Haier and Tesla are examples of companies that leveraged the DBE model to achieve operational excellence.

Haier Smart Home (HSH)

Haier, the company that has developed the RenDanHeYi management philosophy and is a global leader in smart home appliances, exemplifies the successful implementation of a DBE through Haier Smart Home and its Ecosystem Micro Community (EMC) branded SanYiNiao (*Steiber and Alvarez, 2024*). The EMC concept is an ‘Intelligent and Interactive Ecosystem’ and a key concept of the RenDanHeYi model, which has enabled the company to go from “Zero Distance” to users (RenDanHeYi 1.0), to “Zero Boundaries in 2024 (RenDanHeYi 2.0).

As the only company committed to providing comprehensive smart home solutions for all, HSH has transformed traditional home appliances into a cohesive, interactive experience through the SanYiNiao brand. Unlike isolated product offerings, SanYiNiao integrates IoT and AI capabilities, creating a smart home environment that learns and adapts to user needs in real-time. *SanYiNiao*, meaning Three-Winged Bird, showcases a groundbreaking approach to the home appliance industry. Through its Smart Home Brain, SanYiNiao leverages large language models to enhance human-machine interactions, allowing users to control and customize home environments with ease. The brand’s collaboration with

companies like Boloni has enabled users to experience complete solutions, such as fully integrated smart kitchens where appliances, design, and service are unified. As a result, SanYiNiao has been adopted by 540,000 households, with over 10 million active smart devices on the platform. The Haier-driven ecosystem approach allows SanYiNiao to offer a flexible, adaptive service that keeps evolving, breaking boundaries between industries to fulfill personalized needs and driving a new era of connected living.

By utilizing strategic data management and AI, *SanYiNiao* has revolutionized Haier's business model and service delivery. This transformation is built around three key pillars:

- 1. Ecosystem Micro-Community (EMC):** SanYiNiao functions as an EMC, collaborating across industries and companies. This cross-industry partnership enables the brand to offer a diverse range of products and services, tapping into ecosystem revenues while maintaining strong margins.
- 2. Hybrid Sales Model:** *SanYiNiao* combines online and offline channels, leveraging physical 'experience' stores alongside digital platforms to engage customers. This hybrid model enhances customer interaction and convenience.
- 3. Comprehensive Smart Home Solutions:** *SanYiNiao* integrates other EMCs, such as the Internet of Clothing, Internet of Food, and Internet of Entertainment, to deliver holistic smart home solutions tailored to individual user needs.

By taking a data-driven approach and utilizing the 'Smart Home Brain'—the AI functionality of the EMC—*SanYiNiao* gains deep insights into user preferences, allowing for continuous enhancements to the smart home experience. The digital platform seamlessly bridges online and offline interactions, improving the overall user experience and driving ecosystem revenue. In 2022, the ecosystem attracted over one million active users per month, generating substantial revenue and proving the effectiveness of selling integrated solutions rather than standalone products.

Tesla's Energy-Focused Ecosystem

Tesla, widely known for its electric vehicles, has also established a highly successful digital business ecosystem through its energy solutions. This ecosystem integrates Tesla's solar energy products, battery storage systems, and electric vehicles into a unified energy management platform.

At the core of Tesla's energy ecosystem are solar panels, the Powerwall (for home energy storage), and the Powerpack (for commercial energy storage). These components are designed to function together seamlessly, allowing users to generate, store, and use renewable energy efficiently. Through the Tesla Energy app, customers can access real-time data on energy production and consumption, helping them optimize usage and reduce dependence on the grid.

One of Tesla's key innovations is its vehicle-to-grid (V2G) technology, which enables Tesla vehicles to both draw power from the grid and supply energy back to it. This turns electric vehicles into mobile energy storage units, contributing to grid stability and enhancing energy resilience. The V2G technology underscores the interconnected nature of Tesla's products and highlights their value beyond individual applications.

Tesla further leverages AI and data analytics to optimize its energy ecosystem. Machine learning algorithms help manage energy production, predict energy demand, and optimize battery storage, making Tesla's energy solutions both sustainable and economically viable for consumers.

The customer-centric design of Tesla's ecosystem is another significant feature. By providing integrated energy solutions, Tesla gives users greater control over their energy consumption and costs. The seamless integration of products creates a smooth, user-friendly experience, driving customer satisfaction and fostering loyalty.

The Path Towards Operational Excellence

Haier's and Tesla's DBE models to achieve customer-driven operational excellence is a radical shift towards a more flexible, responsive, and innovative cross-industry organizational structure. There are six (6) notable impacts of their Digital Business Ecosystem approach (Steiber and Alvarez, 2024): 1) **Speed and innovation** – well-orchestrated decentralization and collaboration leads to faster action and a more agile operation, 2) **Improved customer focus** – customization and strategic use of data provides greater attention to customer's needs, 3) **Value enhancement** – through the division and reallocation of tasks between members of the ecosystem new value is created and partnerships are strengthened, 4) **Market expansion** – with greater interaction across industries, products are exchanged through cross-industry solutions, more creative solutions are found, and new market pathways are uncovered, 5) **Heightened employee engagement** – with empowered structure and decentralization more initiatives are pursued and their contribution becomes more impactful, and 6) **Better security and data protection** -with attention placed on data and process security the ecosystem integrity is strengthened.

The combined organizational impact of these efforts significantly boosts operational efficiencies, strengthens stakeholder relationships, and paves the way for heightened profitability.

Designing the Digital Business Ecosystems Model in the Workplace

To successfully implement the DBE model in the workplace, companies need to consider four (4) important factors:

Governance – the management team needs to set up a governance structure and strategy that meets common objectives, minimizes risks, and optimizes value creation.

Organizational Structure – the organizational structure needs to be networked and well aligned with the DBE objectives. For instance, changes in workflow and operational processes need to be planned ahead of time to enhance operations and meet the desired objectives of the DBE.

Technological Readiness – the organization needs to understand their level of technological preparedness to appropriately identify areas where technological upgrades are needed in conjunction with the DBE model.

Ecosystem Impact – management must take on a holistic perspective of the DBE model and assess ways to optimize overall stakeholder performance, as well as a fair value sharing. The goal is to enhance as many of the structural components and process as possible. The scope and scale of impact will define the success and sustainability of the DBE model.

Developing the right DBE model for the organization requires significant planning, invocation, and realignment of key stakeholders and resources.

Concluding Thoughts

The age of AI and digital transformation has encouraged companies worldwide to develop innovative Digital Business Ecosystem models in the quest for operational excellence. Haier's Intelligent and Interactive Ecosystem in the form of an EMC, and Tesla's digital business ecosystem provide compelling examples of how businesses, by Haier labelled 'microenterprises' can leverage AI, data management, and cross-industry collaboration (Steiber and Alvarez, 2024) to thrive in this dynamic landscape. Research studies have indicated that manufacturing inefficiencies and poor usage of economies of scope and scale inhibit microenterprise success (Baumann, 2004; Hernandez-Trillo, Pagan and Paxton, 2005). Roberts and Wortham (2018) underscore the importance of data management, research and networks for microbusinesses. Microenterprises benefit from strategic resources and technology (Ehlers and Main, 1998). By embracing the core

attributes of Digital Business Ecosystems within a microenterprise context in an ecosystem, companies can drive innovation, enhance customer experiences, and achieve sustainable growth. As businesses navigate the complexities of the digital age, the lessons from Haier's and Tesla's digital business ecosystems provide valuable insights towards the quest for operational excellence.

References

Baumann, T. (2004). Pro-poor microcredit in South Africa: cost efficiency and productivity of South African pro-poor microfinance institutions. *Development South Africa* 21 (5), 785-798.

Ehlers, T. & Main, K. (1998). Women and the false promise of microenterprise. *Gender and Society* 21 (4), 424-440.

Hernandez-Trillo, F., Pagan, J.A., Paxton, J. (2005). Start-up capital, microenterprises, and technical efficiency in Mexico. *Review of Development Economics* 9 (3), 434-447.

Robert, P.W. & Wortham, D.D. (2018). The macrobenefits of microbusiness. *Innovation Review*. Accessed Oct 13, 2014. Available at:

https://ssir.org/articles/entry/the_macro_benefits_of_microbusinesses

Steiber, A., & Alvarez, D. (2024). AI-driven digital business ecosystems: a study of Haier's EMCs. *European Journal of Innovation Management*, ahead-of-print. <https://doi.org/10.1108/EJIM-01-2024-0076>



Annika Steiber [Follow](#)

Dr. Annika Steiber is a senior executive, advisor, and researcher on innovation management. She is a Management and ISO TC 279 Expert and is the founder of Management Insights and the Rendanheyi Silicon Valley Center.



J. Mark Munoz [Follow](#)

Dr. J. Mark Munoz is a tenured Full Professor of Management at Millikin University, and a former Visiting Fellow at the Kennedy School of Government at Harvard University. Aside from top-tier journal publications, he has authored/edited/co-edited more than 20 books such as: Global Business Intelligence and The AI Leader.