

Original Paper

Symbiosis and Evolution: Reconstructing the Digital Publishing Landscape Based on Innovation Ecosystem Theory

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Abstract

Digital publishing companies generally face the challenge of insufficient innovation momentum during the transformation process. The innovation ecosystem is an innovation paradigm with the concepts of “resource sharing, value co-creation, diversified symbiosis, and collaborative innovation”. It is an emerging driving force for innovative development. This paper integrates the innovation ecosystem theory from management discipline into the field of digital publishing, examines the historical trajectory and progression of the theory by conducting a systematic literature review, and constructs a theoretical framework of the innovation ecosystem. With symbiosis and evolution as the core, the innovation ecosystem reconstructs the development landscape of digital publishing from an ecological perspective, and provides theoretical support for solving the innovation problems of digital publishing in terms of innovation concepts, organizational relationships, and innovation momentum.

Keywords

digital publishing, social sciences, innovation ecosystem, symbiosis

1. Introduction

In recent years, with the comprehensive layout of the Digital China initiative and the continuous advancement of the national cultural digitalization strategy, China's digital publishing industry has demonstrated strong growth momentum. According to the “2023-2024 Annual Report on China's Digital Publishing Industry” released by the Chinese Academy of Press and Publication, the overall scale of China's digital publishing industry reached 1,617.968 billion yuan over the past year, representing an increase of 19.08% compared to the previous year. While the digital publishing industry demonstrates a positive development trajectory, it still faces numerous challenges that require urgent resolution. The main manifestations include: a shortage of talent in emerging publishing formats, insufficient R&D investment, weak digital copyright protection capabilities, insufficient innovation

capabilities, inadequate data resource development and management practices, and inconspicuous benefits from digital transformation etc., which restrict the continuous innovation of the digital publishing industry. Continuous innovation refers to the process of enterprises continuously launching innovative projects and realizing innovative economic benefits for a considerable period of time, emphasizing the sustainability of innovation in terms of time, effect growth and development. For the development of digital publishing, to achieve continuous innovation is to enhance the momentum of innovation and have a steady stream of innovation driving force.

Innovation ecosystem is regarded as an emerging driving force for innovation development, which is a dynamically coordinated structure dominated by a common value proposition and composed of innovation activities of diverse participants. Much like a natural ecosystem, it continuously evolves through feedback loops with the external environment, thereby driving enterprises to pursue sustained innovation. Enhancing the innovation momentum in digital publishing is an internal requirement for the industry to improve its quality and efficiency. By building an innovation ecosystem, digital publishing firms can gain a perpetual source of innovation impetus. empowered by such ecosystems, digital publishing field may present a new landscape characterized by greater diversity, openness, intelligence, and integration.

2. Literature Review

2.1 Research on Digital Publishing

In 2011, the former General Administration of Press and Publication of China first defined the concept and characteristics of digital publishing, stating: “Digital publishing is an emerging publishing format resulting from the integration of the publishing industry and high-tech, characterized primarily by the digitalization of content production, management processes, product forms, and networked dissemination channels”. The digital publishing industry is an emerging publishing format born from the integrated development of the publishing industry and digital technologies, such as media technology, network technology, and display technology. In research on the development of digital publishing, how to enhance innovation capacity and secure sustained momentum for innovative development has become an urgent issue requiring attention in the current digital publishing landscape. Based on a review of literature related to innovative development in digital publishing from 2023 to 2025 retrieved from the CNKI database, this study identifies several key research focuses in the innovative development of digital publishing enterprises. These include: first, studies on high-quality development of digital publishing; second, research on the deep integration and development of digital publishing; third, investigations into new business models and formats in digital publishing; and fourth, examinations of how generative artificial intelligence technologically empowers digital publishing. These studies have explored approaches to fostering innovation in digital publishing from various

perspectives—including national strategy, industrial structure, production factors, and digital technology—laying a solid theoretical foundation for innovation studies in this field. However, against the backdrop of rapid global economic development and increasingly blurred industrial boundaries, there is a growing need to examine digital publishing through the lenses of dynamic development and ecological evolution.

2.2 Research on Innovation Ecosystem

The theory of Innovation Ecosystem originates from the field of management science. It emphasizes that grounded in shared value propositions, ecological subjects are driven to continuously engage in innovation activities through mechanisms such as openness, dynamic interaction, and symbiotic evolution. This process progressively enhances the vitality of the ecosystem and secures a sustained driving force for innovation. The origin of the innovation ecosystem can be traced back to the first half of the 19th century.

The National Innovation System is the earliest theoretical source of the innovation ecosystem. In 1841, German economist Friedrich List proposed the “state system”, which is a combination of state proprietary factors and political economy, which believed that the German government should establish a state system to promote the development of modern German industry and economy in the case of obvious backwardness in German industry. Later, British scholar Alfred Marshall proposed the concept of “agglomeration”, suggesting that clustering generates effects that stimulate innovation (Carlino et al., 2007), Bringing together similar or complementary companies in an area can not only trigger competition but also promote mutual learning, thereby stimulating innovative behavior. Entering the 20th century, Schumpeter (1934) first proposed the concept of “innovation” in his Theory of Economic Development, clarifying the close connection between economic development and innovation. Further building on this, Lundvall (1985) pioneered the concept of “innovation systems”, arguing that innovation involves complex cooperative relationships and is the result of interactions among multiple actors within a system.

Since Schumpeter introduced the concept of “innovation”, research in this field has excessively emphasized innovative activities themselves while gradually neglecting their social context and historical conditions. Consequently, when examining Japan’s rapid post-war economic growth in the latter half of the 20th century, Freeman (1987) proposed the concept of the “National Innovation System” to describe Japan’s successful catch-up. He defined it as a network of public and private sector institutions whose activities and interactions determine the development, introduction, refinement, and diffusion of new technologies. Building on this concept, Nelson (1993) conducted further research on national innovation systems, comparing and analyzing different systems and constructing a general model for their analysis. Cooke (1992) criticized this model, emphasizing the importance of regions and arguing that interactive learning between regions could significantly enhance innovation efficiency,

thereby introducing the concept of the “Regional Innovation System”.

However, with the rapid development of internet technology and the deepening of economic globalization, innovation activities gradually transcended national and regional boundaries. The concepts of “National Innovation System” and “Regional Innovation System” were called into question, leading some scholars to propose “Cluster Innovation Systems” and “Sectoral Innovation Systems” as alternatives that are not constrained by geographical space. In his work *The Competitive Advantage of Nations*, Porter (1990) introduced the concept of “clusters”, describing them as geographic concentrations of interconnected companies and institutions in a particular field that foster innovative behavior through competition and collaboration. Porter’s approach of using industrial clusters to analyze the competitive advantages of nations or regions gained widespread acceptance in academia. Meanwhile, Malerba (2002) proposed the concept of “Sectoral Innovation Systems”, suggesting that market and non-market interactive learning processes within sectoral systems can generate new technologies and products.

Social context and economic development have propelled research on innovation ecosystems. After the 1990s, the rapid expansion and sustained growth of Silicon Valley in the United States prompted scholars to explore innovation from an ecological perspective, leading to increased focus on the Innovation Ecosystem. Over the past two decades, research on innovation ecosystem has sustained growing academic interest. continued to grow, and the research has gradually radiated from developed countries such as Europe and the United States to developing countries, and its ecological concept has been widely recognized by the world and has become a theory of great concern in the 21st century.

In the context of business management applications, Moore (1993) was among the first to propose using the natural ecosystem as a metaphor for understanding the complex innovation environments in which enterprises operate. He argued that firms should not be viewed merely as members of a single industry but as part of ecosystems spanning multiple industries. Iansiti and Levien (2004) further proposed that only by adopting mutually beneficial and symbiotic strategies can enterprises maintain the coordination and stability of the innovation ecosystem. Building on earlier views, Adner (2006) proposed that an innovation ecosystem is a synergy mechanism through which firms collaborate to integrate their products into unified customer solutions. Adner (2010) focused on the innovation ecosystem itself, positing that a firm’s innovation is closely related to its environment and other ecosystem members. Through synergy mechanisms, enterprises interact with other members to create value that no single enterprise could achieve alone.

An innovation ecosystem is a system that continuously self-reconfigures, self-emerges, and self-evolves in response to changes in the external environment to achieve sustained growth and value creation. Currently, with the rapid development and widespread application of digital technologies such as internet technology, big data, and artificial intelligence, innovation ecosystems are undergoing a

digital transformation of their actors, structures, institutions, and functions. Today, digital transformation has become pivotal to the continuous evolution of innovation ecosystems, making the exploration of their driving mechanisms under this context a research frontier.

3. Theoretical Framework

3.1 Innovation Ecosystem Theory

The Innovation Ecosystem Model is a paradigm that emerges from platform-based networks, gathering innovative forces through shared value propositions. Within this system, participants spontaneously engage in resource sharing and collaborative co-creation centered around common value ideals, with the goal of achieving collective innovation and value generation. The core principles of the innovation ecosystem are symbiotic collaboration and dynamic evolution. Drawing an analogy to natural ecosystems, the innovation ecosystem transposes concepts such as communities, matter, energy, and information into the operational mechanisms of the innovation process—encompassing innovation actors, innovation resources, and the innovation environment. This forms a symbiotic and evolving system that continuously stimulates innovation activities, ensuring their stability and sustainability.

As a new paradigm for driving innovative development, the innovation ecosystem provides sustained momentum for digital publishing by integrating the innovation activities of diverse actors and creating synergistic effects. Furthermore, the industrial characteristics of digital publishing—namely its openness, deep integration, and ecological nature—dictate that research in this field increasingly requires an in-depth exploration from an ecological perspective. Existing practices have demonstrated the feasibility of digital publishing enterprises constructing innovation ecosystems. By building such ecosystems characterized by multi-actor collaboration, enterprises have achieved boundaryless growth and sustained innovation.

3.2 Symbiosis Theory

Although the innovation ecosystem theory is still an emerging concept in the field of digital publishing, the symbiotic logic it embodies is widely referenced and applied in media studies in the form of symbiosis theory. Innovation ecosystem theory represents a further development of symbiosis theory, as symbiosis theory provides a robust theoretical foundation for digital publishing enterprises to construct innovation ecosystems. The term “symbiosis” originates from Greek. In 1879, the German mycologist Heinrich Anton de Bary first introduced the concept of symbiosis, pointing out that due to survival needs, two or more organisms depend on and interact with each other in certain patterns, forming a symbiotic relationship of coexistence and co-evolution.

The concept of symbiosis expanded from biology to economics and social sciences in the mid-20th century, with symbiotic theory gradually extending to industrial symbiosis and industrial ecosystems. This theoretical framework has been widely applied to publishing studies, generating multidisciplinary

explorations in international communication, media convergence, digital transformation, and corporate integration. Notably, due to the interdisciplinary nature of digital publishing, symbiotic theory has found particularly extensive application in this field, thereby providing substantial theoretical foundation for constructing innovation ecosystems in digital publishing enterprises.

4. Discussion

Currently, the Innovation Ecosystem theory has been widely used in the research of regional innovation and industrial innovation. Applying the innovation ecosystem theory to the innovative development practices of digital publishing will help digital publishing enterprise transform their innovation concepts and build collaborative partnerships, which helps them strengthen their position within the ecosystem and sustain a steady flow of innovation drive. The innovation ecosystem, with symbiosis and evolution at its core, reconstructs the developmental landscape of digital publishing from an ecological perspective. It provides theoretical support for addressing innovation challenges in digital publishing through transforming innovation paradigms, reshaping organizational relationships, and acquiring sustained driving forces for innovation.

4.1 Symbiosis: Transforming Innovation Concepts

From the perspective of enterprise innovation strategy, the innovation ecosystem theory is conducive to guiding digital publishing enterprises to transform their innovation concepts. In the context of the rapid development of platformization, the most important form of competition today has changed from competition between enterprises to competition between platforms and platform ecosystems. Therefore, digital publishing companies need to change their innovative concepts. The innovation ecosystem theory guides the transformation of business strategy from simple joint operation to collaborative and systematic cooperation, from product competition to platform competition, and from independent development of enterprises to symbiotic evolution. Under the guidance of innovation ecosystem theory, digital publishing companies no longer regard themselves as a single closed organization, but openly evolve symbiotically with the entire ecosystem, creating value that cannot be created by a single enterprise. Digital publishing companies should make full use of digital technology, platforms, and artificial intelligence to build an open and diverse ecosystem, include stakeholders and value creators in their own ecosystem, and develop symbiotically with the entire ecosystem.

4.2 Synergy: Building Collaborative Partnerships

The innovation ecosystem theory facilitates the establishment of symbiotic, co-evolutionary, open, and collaborative organizational relationships for digital publishing enterprises. In an era where industry boundaries are increasingly blurring and the boundaries of innovation urgently need to be broken, digital publishing enterprises must seek new organizational forms to drive the integrated development of publishing. The innovation ecosystem represents a dynamic coordination structure, steered by a

common value proposition and composed of the innovative activities of diverse participants. Its innovation process is characterized by self-organizing properties and continuously evolves through feedback loops with the external environment, thereby supporting enterprises in sustaining innovation. Innovation ecosystem emphasizes non-contractual, interdependent governance relationships. Its self-organizing nature stems from the shared goal of value creation among ecosystem members, along with their interconnected, interactive, and interdependent complementarities. The complementary combinations generated by these multilateral dependencies possess a potential value-added effect, capable of infusing enterprises with diverse innovative vitality. Grounded in this theory, digital publishing enterprises need to build mutually beneficial and symbiotic relationships around a common value proposition. By leveraging shared values as a bond, they can engage in value co-creation and value sharing, ultimately achieving collaborative innovation among diverse actors.

4.3 Evolution: Cultivating Ecosystem-driven Momentum

From the perspective of the source of innovation driving force, the innovation ecosystem arises from the ecology itself, and ecological power is the most important endogenous driving force of digital publishing enterprises. The interconnection and mutual constraint of various elements in the ecosystem require the symbiosis and co-prosperity of various innovation subjects, which leads to the ability of the innovation ecosystem to continuously evolve, continuously promote the growth of dominant new species, and constantly transcend itself. Just as natural ecosystems have ecological characteristics such as openness, diversity, integrity, and stability, which jointly promote the symbiotic evolution of ecosystems, innovative ecosystems also gain the power of continuous evolution, development and progress from their ecology. The innovation ecosystem is conducive to digital publishing enterprises to promote the continuous innovation activities of ecosystem subjects through openness, dynamic interaction, symbiosis and co-evolution, so as to continuously enhance the ecological power, enable members to gradually benefit from ecological advantages, and enhance the consistency of the ecosystem, promote the high-order evolution of the ecosystem, so as to maintain the vitality of the system and obtain continuous innovation driving force.

4.4 Connection: Forging Open Ecosystem Network

Digital publishing possesses strong connectivity. Compared with traditional publishing, it is primarily characterized by the digitization of content, management processes, and product forms, as well as the network-based dissemination channels. As a digitally empowered form of publishing, digital publishing achieves cross-boundary integration through digital technologies such as 5G, big data, and artificial intelligence.

Furthermore, digital publishing exhibits distinct ecological attributes. It interacts with numerous ecological elements, forming a symbiotic and co-evolutionary ecosystem. The digital publishing industry has developed different value chains around various stages—content production, technology

operation, and product marketin—which interweave and develop synergistically, collectively driving the evolution of the digital publishing ecosystem.

The development model of multi-agent collaboration and symbiosis, along with the deeply integrated cross-sector development formats, endows the digital publishing ecosystem with features such as openness, complexity, diversity, dynamism, collaboration, and self-organization. These ecological characteristics create a natural foundation for digital publishing enterprises to build an innovation ecosystem. Within this dynamic and open system, digital publishing and various ecological elements depend on each other and co-evolve, working together to achieve the overarching goal of innovation.

5. Conclusion

Digital publishing enterprises need to construct an innovation ecosystem to address their transformational development and innovation momentum issues. From an academic research perspective, the interdisciplinary integration of digital publishing with multiple disciplines and fields represents a developmental trend in the field. Transformational development, deep integration, copyright issues, and technology application in digital publishing have become key research foci. These research areas have long transcended the boundaries of traditional publishing studies, necessitating multidisciplinary approaches to digital publishing research. Currently, there are relatively few studies examining digital publishing innovation from an ecological perspective. This research draws on the theory of innovation ecosystems from management science to provide a ecological perspective for digital publishing innovation studies. Based on the literature tracing and sorting out the theory of innovation ecosystem, this paper points out that innovation ecosystem can reshape the digital publishing landscape in terms of changing innovation concepts, building collaborative organizational relationships, building continuous innovation driving forces, and building open ecological networks, providing an ecosystem perspective for solving the problem of innovation dynamics in digital publishing. However, the exploration of digital publishing innovation ecosystems in this paper is limited to theoretical deduction. Future research should employ specific methods such as case studies and data analysis to provide practical evidence for the development of digital publishing.

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