

Digital Economy and Knowledge Management Literature Review

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Abstract: The digital economy continues to flourish and combine with the field of knowledge management practice, giving birth to a new way of knowledge management, and knowledge has become one of the important resources of enterprises. This paper focuses on the definition of digital economy, digital innovation through literature combing and reading, and studies knowledge management from the perspective of digital economy, the data, network, intelligence and sharing characteristics of the digital economy has changed the traditional way of acquiring knowledge and information and the speed, and further combed the digital economy, digital technology, digital innovation model and other factors on the impact of knowledge management, the digital economy on knowledge integration, The impact of digital economy on knowledge management contents such as knowledge integration, knowledge creation and knowledge sharing, as well as the negative impact of digital economy on knowledge management are further investigated, so as to broaden the new research field of knowledge management in digital economy.

Keywords: Digital economy; Knowledge management; Digital innovation.

1. Introduction

The concept of the digital economy was proposed in the 1990s and has since garnered widespread attention and in-depth research. Scholars' interpretations of its connotation have continuously evolved. As an economic form based on digital technology, the essential characteristic of the digital economy lies in utilizing digital technologies for production [1]. In 2016, the G20 Hangzhou Summit defined the digital economy as a series of economic activities that use digitalized knowledge and information as key production factors, modern information networks as important carriers, and the effective application of information and communication technologies as crucial drivers for enhancing efficiency and optimizing economic structures [2]. Currently, it is widely accepted that the digital economy refers to an economic paradigm centered on digital innovation, conducting economic activities based on digital technologies, and representing the deep integration of digital technologies with economic and social development [3]. With the internet as its foundation and supported by digital infrastructure, the digital economy offers advantages such as facilitating information dissemination, fostering knowledge creation, and reducing transaction costs [4].

Based on the advantages and essence of the digital economy, optimizing the efficiency of factor allocation and enhancing the utilization of innovative elements, combined with the deep application of digital technologies, promotes the identification, creation, and acquisition of knowledge value, thereby stimulating the realization of corporate digital innovation [5]. Digital innovation serves as a crucial engine driving the growth of the digital economy, primarily encompassing innovation, digital technologies, and digitalization [3]. It emphasizes the integration of digital technologies and innovative resources, thus enabling digital products—as carriers of digital technologies and resources—to incentivize corporate digital innovation through the digital innovation effects brought about by the application of digital technologies [6]. Peng Fanyi explored the mechanism of

knowledge service innovation and constructed a digital-era knowledge service innovation model to explain the innovation mechanism of knowledge services in the digital age, thereby expanding the theory of knowledge services [7]. Nwankpa et al. posited that digital business innovation facilitates knowledge management and subsequently exerts a positive impact on process innovation, indicating an interactive relationship between innovation and knowledge management [8]. Firk et al. (2022), grounded in role theory and employing panel data regression, found a positive correlation between the digital knowledge of top management teams and digital innovation under the moderating effect of their integrative roles [9]. This suggests a close linkage between digital knowledge and digital innovation. Hui and Yu (2022) discovered that technological resources and digital dynamic capabilities both play positive roles in the mechanism through which knowledge coupling influences corporate innovation outcomes [10]. Song Jing and Ye Tao, based on neo-Schumpeterian growth theory and empirical data, demonstrated that the digital economy significantly enhances the quality of corporate innovation [11].

To comprehensively and systematically analyze the impact of the digital economy on multi-knowledge management, this paper reviews relevant literature to examine the current state of research on how the digital economy influences knowledge management. Specifically, it addresses the following questions: What is digital knowledge? What are the influencing factors of knowledge management in the digital economy? What are the specific impacts of the digital economy on knowledge management?

This paper makes the following key contributions to theoretical research and practice in this field: First, it focuses on the close connection between knowledge management and digitalization, thereby broadening the research scope. Second, it systematically examines the influencing factors of digital knowledge and identifies potential obstacles in the digitalization of knowledge.

2. Research Status on the Impact of Digital Economy on Knowledge Management

Traditional knowledge management systems suffer from excessively long document search times, information overload, and a lack of digital platforms and unified management models to drive innovation [12, 13]. From a technical knowledge perspective, the proactive capabilities of information technology or systems are key to enterprise business transformation, and the intensity of an enterprise's digital operations profoundly impacts its organizational knowledge management capacity [14]. In the era of the digital economy, as digitalization advances, the success of digital transformation and the quality of knowledge management are mutually reinforcing [15]. Enterprises can maximize their knowledge practice processes, managers can leverage emerging technologies to manage knowledge resources [16], and customers can engage in knowledge management through user participation to enhance service innovation performance [17].

2.1. Definition of Digital Knowledge

Knowledge resources have become the core assets of enterprises, and an efficient knowledge management system helps companies gain competitive advantages [18]. Knowledge management involves the comprehensive administration of knowledge across its flow, sharing, transformation, acquisition, organization, integration, application, and innovation. The digital economy, characterized by digitization, networking, intelligence, and sharing [19], has transformed the traditional methods and speed of acquiring knowledge and information [20]. It facilitates the efficient operation of knowledge management systems and supports future knowledge management frameworks in achieving real-time dynamic decision-making, comprehensive knowledge management, systematic integration of fragmented knowledge, establishing human-computer interaction-based tacit knowledge conversion mechanisms, developing platform-based knowledge graphs, and forming highly efficient innovative organizations [21].

Knowledge refers to the human capital of modern society and can be primarily categorized into three types: explicit knowledge, tacit knowledge, and inherent knowledge. Among these, tacit knowledge can be further divided into directional knowledge and methodological knowledge [22]. To adapt to the development of the digital information era, the definition of knowledge has continuously been enriched and expanded, giving rise to the concept of digital knowledge. Roshchin et al. argue that knowledge is not only the source of innovation, development, and applied research but also the driving force behind the digital economy [23]. The digital economy compels knowledge to be allocated as a developmental factor and primary competitive advantage for enterprises. Mizintseva further posits that economic innovation is often a direct result of knowledge management and its exchange [24].

Digital knowledge refers to the core knowledge that serves corporate digital transformation and thereby enhances enterprise innovation performance [25]. Digital knowledge emphasizes the continuity and reconfigurability of information relationship construction, rather than being confined solely to factual and logical conformity [26]. Digital knowledge can guide enterprises in architecting digital infrastructure and also facilitates the strengthening of digital

management capabilities, thereby elevating corporate digitalization levels [27]. As digital development assists enterprises in better planning and executing strategies, the application of digital knowledge ensures business continuity in uncertain environments [28]. The emergence of digital knowledge has not only enriched knowledge within organizations but also innovated the development of external organizational knowledge, deepening the connections between organizations and their stakeholders. The advent of digital technologies has established platforms for digital communication between customers and enterprises, enabling customers to participate in the process of technology commercialization. Customer involvement in this process essentially represents the integration of demand knowledge and technological knowledge [29], thereby driving the continuous development of the knowledge system. While the entire knowledge framework undergoes constant reconstruction and rapid advancement, digital knowledge is also constrained by the institutional pressures of the external environment [30].

2.2. Influencing Factors of Knowledge Management in the Digital Economy Era

The impact of the digital economy on knowledge management mainly includes two aspects: first, the positive facilitating effect of using digital technologies to accelerate knowledge storage, dissemination, and application; second, the reverse incentive effect of weakening the discourse power of inherent and explicit knowledge, thereby promoting human advancement toward higher-order tacit knowledge [29]. The digital economy can increase knowledge stock, enhance knowledge dissemination efficiency, reduce information asymmetry, and efficiently aggregate more knowledge resources by influencing the flow of innovative knowledge [31].

2.2.1. Digital Technology

The essence of knowledge flow is the movement of different ideas among different entities, which enhances the overall knowledge level over time. Knowledge flow is inextricably linked to the development of digital technologies. Digital technologies support knowledge exchange activities, thereby improving various capabilities of enterprises operating in digital environments. The utilization of digital technologies such as big data and 5G networks enhances enterprises' management decision-making levels [32], accelerates the speed of internal and external knowledge flow, and enables knowledge resources to successfully reach where they are needed. This, in turn, improves technological innovation efficiency and positively impacts enterprise technological innovation [33]. Leveraging available technological resources during knowledge exchange processes to drive innovation can help stimulate participants' creativity and develop economical, sustainable solutions through the interaction of explicit and tacit knowledge transfer [34]. Meanwhile, within the variables of digital power, the motivation for use and digital technologies can profoundly influence the information society and the level of technological knowledge [35]. Based on this, the deep application of digital technologies provides digital platforms for knowledge exchange within organizations, facilitating cross-temporal and spatial knowledge interactions among employees and departments. The degree of digitalization between organizations can break through hierarchical structural constraints, creating a favorable environment for

knowledge sharing and enhancing its efficiency [29]. Castagna et al. (2020) found in their study on the supportive role of digital technologies in customer knowledge management for small and medium-sized enterprises in the creative industries that relying on traditional methods and lacking information technology support prevents businesses from responding quickly to relevant changes [37]. Therefore, in an era of highly developed digitalization and intelligence, leveraging digital technologies to enhance organizational decision-making, accelerate knowledge sharing, and promote the absorption of heterogeneous external knowledge for technological renewal and development—combined with knowledge reconstruction capabilities for knowledge recreation and reuse—can achieve disruptive technological innovation [38].

2.2.2. Digital Innovation Model

According to relevant literature reviews, digital innovation can act upon knowledge management to facilitate business model innovation [39]. The digital innovation model breaks through the boundaries of innovative thinking, incorporates external heterogeneous knowledge, and provides cross-organizational knowledge interaction channels, thereby accelerating the flow of knowledge across organizations and stimulating the activity of knowledge fields to enhance the efficiency of corporate digital innovation [40]. Flowing digital innovation contributes large-scale knowledge and facilitates rapid evolution through knowledge accumulation [41]. Open innovation, as an innovation model empowered by digital technologies, influences digital innovation in the era of the digital economy. The essence of open innovation lies in knowledge sharing and integration, thus realizing the knowledge management process and refining knowledge structures, which holds profound significance for promoting digital innovation [6]. Due to the openness, interactivity, and uncertainty brought about by the digital economy environment, enterprises are compelled to construct open innovation mechanisms based on knowledge sharing, laying a solid foundation for corporate innovation [42].

2.3. Impact of Digital Economy on Knowledge Management Content

Knowledge management, as an emerging management concept in the era of knowledge economy, primarily encompasses the integration, creation, and sharing of knowledge. The impact of digital economic development on knowledge management is specifically reflected in the digitization of related content, thereby achieving innovation in the entire theoretical system of knowledge management.

2.3.1. Impact of Digital Economy on Knowledge Integration

Knowledge integration capability primarily encompasses the abilities of information collection, processing, and reuse. The stronger the knowledge integration capability, the higher the effective utilization rate of resources, and the greater the innovative value it brings to enterprises (Liu Bingfeng and Wang Xiaomei, 2019; Xie Xuemei and Xu Maoyuan, 2019) [43]. From the perspective of influencing factors, knowledge integration capability is related to internal and external communication among knowledge entities, information systems, and network collaboration, among others. Particularly in interdisciplinary teams, factors such as relationship strength, trust, and shared vision among team members positively influence the team's knowledge

integration (Zhang et al., 2015) [44]. The utilization of digital technologies enables the screening, integration, and classification of massive fragmented information and knowledge, thereby increasing knowledge stock (Han Zhao'an et al., 2022) [45]. Tong Hongxia (2021) [42] posits that under the characteristics of the digital economy environment—openness, boundarylessness, strong interactivity, and uncertainty—implementing open innovation has become a significant approach for organizational innovation and development. Essentially, the process of open innovation is one of knowledge integration, application, and re-creation (Gassmann et al., 2016) [46]. The implementation of open innovation expands the breadth and depth of organizational knowledge, enhancing the organization's knowledge integration capability. Simultaneously, the greater the diversity of network members, the higher the value of open innovation, which in practice not only facilitates the acquisition of heterogeneous knowledge resources but also enables comprehensive integration of knowledge resources, thereby improving organizational knowledge integration capability (Chesbrough, 2011) [47].

The digital era has created opportunities for enterprises to acquire new knowledge, where the utilization of technological resources and the cultivation of digital dynamic capabilities can achieve knowledge coupling [48]. Supported by digital technologies, activities such as knowledge transfer, acquisition, and absorption by workers can proceed more smoothly. Furthermore, the advancement of digital technologies has brought long-distance "face-to-face" communication into reality, enabling knowledge flows to transcend physical and temporal constraints, thereby enhancing the efficiency of knowledge dissemination and significantly improving the efficiency of knowledge circulation (Arthub, 2007; Han Zhao'an et al., 2022) [30]. Ruiz et al. (2020) extended the study of absorptive capacity to digital open environments, investigating the absorption of unconventional knowledge from unknown partners and proposing that crowdsourcing based on internet platforms leverages remote search to help enterprises acquire external new knowledge [49]. Arfi and Hikkerova (2022) argue that the rise of the internet and ICT has spurred the development of the sharing economy, where the establishment of digital platforms connects suppliers, consumers, and other actors, creating a favorable environment for the free exchange and acquisition of knowledge [50].

2.3.2. Impact of Digital Economy on Knowledge Creation

Continuous knowledge innovation is a modern knowledge management process that enables organizations to achieve knowledge value appreciation, enhance core competitiveness, and realize sustainable development. The vitality of enterprises lies in innovation. As the final stage of knowledge management, the efficiency of knowledge innovation is influenced by the preceding processes of knowledge flow, sharing, transformation, acquisition, organization, and integration. Through empirical research on 170 Chinese enterprises, Wei et al. (2021) found that corporate IT capabilities positively impact both the breadth and depth of knowledge, thereby improving knowledge innovation [51]. Su et al. discovered that in the digital economy environment, enterprises recognize knowledge creation as a spiral process involving the interaction of explicit and tacit knowledge, and they engage in knowledge management to strengthen their competitive advantage in innovation [52].

The continuous advancement of digital-era technologies

has enabled the sharing of knowledge to transcend organizational boundaries, facilitating the creation and development of new knowledge across organizations. Abbate et al. (2019) conducted a single-case qualitative study on open innovation digital platforms, highlighting how enterprises can effectively explore, acquire, integrate, and develop valuable knowledge through such platforms. They emphasized that open innovation processes, tools, and services promote knowledge co-creation [53]. Bereznoy et al. (2020) explored the interaction between knowledge creation and knowledge sharing in the digital age from an open innovation perspective. They established a new theoretical framework and introduced the concept of "bar," which manifests in the form of digital platforms to facilitate the interplay between knowledge sharing and knowledge creation [54]. The outbreak of COVID-19 in 2019 and the resulting social distancing requirements led to disruptions in the work domain. A survey of knowledge workers in Norway revealed that the use of digital platforms transcended the "time-space" constraints of knowledge, facilitating knowledge innovation through knowledge sharing under such challenging circumstances (Tnnessen et al., 2021) [55]. Liu Keyan (2022) posited that digitally empowered knowledge transfer can positively influence a firm's innovation performance. By leveraging digitally empowered knowledge transfer, enterprises can enhance their knowledge stock and proficiency in applying digital technologies, thereby providing foundational support for the knowledge base and digital capabilities required for innovation activities [56]. Ma Yonghong and Li Baoxiang (2022) explored the impact of the digital economy on the innovation performance of regional high-tech enterprises and the mechanism of regional university knowledge transfer in this pathway. They found that university knowledge transfer and the digital economy exhibit a positive interactive driving effect. Under the influence of university knowledge transfer, the digital economy exerts a "U-shaped" impact on the innovation performance of high-tech enterprises [57]. Qin Dajia et al. (2022) argued that the rapid development of digital technologies has transcended global temporal and spatial boundaries, facilitating knowledge interaction among knowledge entities with diverse cultural backgrounds. However, heterogeneous cultural conflicts may lead to cognitive disparities. Consequently, they incorporated situational factors into the SECI model, constructing an ocean model for cross-cultural knowledge creation in the context of the digital economy [58].

2.3.3. Impact of the Digital Economy on Knowledge Sharing

With the development of the digital economy era, network capabilities can be utilized to guide organizational innovation behaviors and knowledge sharing [59]. The quality of organizational knowledge and the willingness to share knowledge influence overall industry performance, with knowledge sharing playing a central role [26].

First, with the advent of internet access, digital technology has enhanced communication and coordination among individuals within organizations [40], ensuring cross-location knowledge flows between organizations. While strengthening individual decision-making capabilities, it also empowers knowledge sharing, thereby improving personal performance and organizational competitive advantages [60]. Liu Bingfeng and Wang Xiaomei argue that knowledge sharing facilitates employees' exchange and discussion of acquired knowledge, establishing an internal knowledge network

within enterprises. This reduces resource wastage, lowers communication costs, and aids companies in achieving innovative breakthroughs (Liu Bingfeng & Wang Xiaomei, 2019) [43]. Leveraging digital technology, knowledge sharing has become more efficient and convenient, promoting knowledge flows that transcend conventional knowledge transfer processes, thereby providing foundational support for organizational knowledge innovation [61]. Forman and Zeebroeck (2018) argue that digital technologies can facilitate knowledge sharing among geographically dispersed organizations only when the knowledge source and recipient share a common knowledge base [62]. Stachová et al. (2020) analyzed the organizational status, knowledge value, knowledge sharing methods, knowledge database utilization levels, and organizational regions in Slovakia, concluding that digital technologies' promotion of knowledge sharing can enhance international competitiveness [63]. Wang et al. (2021) established a knowledge sharing model based on principal-agent theory, pointing out that the application of digital technologies can effectively reduce three types of costs—information expenses, channel losses, and time costs—thereby effectively addressing the time constraints in knowledge sharing [64]. Troise (2022) proposed that in the digital era, the use of emerging digital tools can make knowledge visible, promote greater interactivity between enterprises and stakeholders, thereby facilitating knowledge dissemination [65]. The utilization of digital technologies can strengthen communication and coordination among individuals within organizations, improve knowledge sharing and decision-making, and consequently enhance work performance (Deng et al., 2022) [66]. The application of digital technologies enables enterprises to precisely and systematically control the commercialization process of technologies (Qi Yudong & Xiao Xu, 2020) [67]. The integration with digital technologies allows knowledge sharing to occur in the context of customer participation, where knowledge is shared and created according to customer needs, thereby improving the efficiency of knowledge sharing. Moreover, the higher the level of an enterprise's digitalization, the more knowledge sharing can break through the hierarchical structure of the organization, creating a favorable organizational environment for knowledge sharing and thus enhancing its efficiency (Du Xiaomin et al., 2022) [68].

Furthermore, the rise of digital platforms can further stimulate individual motivation and promote knowledge sharing both within and outside organizations, thereby enhancing innovation performance [69]. Tong Hongxia (2021) [42] argues that in the context of the digital economy, establishing an open innovation mechanism based on cooperation and sharing through industry-university-research collaborative R&D, synergistic innovation, and technology-sharing alliances is also a necessary pathway for corporate innovation. This approach enables enterprises to acquire knowledge, technology, and resources externally through knowledge sharing, thereby reducing innovation costs and improving the speed and quality of innovation. Tian Ying et al. (2021) point out that the emergence of open-source digital innovation communities has overcome the barriers to knowledge sharing posed by uncertainty. Moreover, with the advancement of open-source digital technologies, the deepening of social interactions among knowledge entities has become a key factor in facilitating knowledge sharing [70].

Then, digital development plays different roles in

enterprises with different ownerships or industries. Proeger and Runst (2020) proposed that the digitalization process serves as a central mechanism for knowledge spillovers, effectively breaking barriers to knowledge flow through knowledge filters and absorptive capacity [71]. Ma and Li (2022) measured digitalization across more dimensions, revealing the mechanisms through which digitalization influences knowledge transfer [72]. Sundaresan and Zhang (2020) found that digitalization affects reward systems within corporate social networks, suggesting that incentive system designs leveraging digitalization can motivate employees to share knowledge [73]. Tønnessen et al. (2021) found that internal and external digital knowledge sharing are significant predictors of creative performance. Gender and age have a substantial impact on external knowledge-sharing behaviors, while individual motivation shows a positive correlation with both internal digital knowledge sharing, external digital knowledge sharing, and creative performance. Increasing the use of digital platforms can promote knowledge-sharing behaviors within organizations, thereby contributing to enhanced creative performance [74]. Huang Zhengzheng et al. (2021) proposed that the traceability, immutability, and decentralization features of blockchain can be effectively applied to the field of knowledge sharing, facilitating the establishment of an intellectual property protection ecosystem and thus improving willingness to share knowledge (Ma Jianrui et al., 2022) [75, 76].

Moreover, the digital era has fostered a favorable environment for knowledge sharing. Natu and Aparicio (2022) took software development roles in virtual teams as their research subject, exploring employees' knowledge-sharing motivations and behaviors in this emerging digital scenario, while emphasizing the impact of organizational culture on knowledge sharing within virtual teams [78].

2.4. Negative Impact of the Digital Economy on Knowledge Management

2.4.1. Knowledge Gap

With the rapid development of digital technology, differences in individual cognition lead to variations in the understanding and utilization of core social technologies, resulting in the emergence of a digital divide. This digital divide can further give rise to a knowledge gap. Yi (2020) explored the impact of individual digital competence on the knowledge level of intelligent information society and technology, proposing the importance of fostering individual digital competence, enhancing educational standards, overcoming social pressures and biases, and cultivating a favorable cultural environment for digital competence development [79].

2.4.2. Disciplinary segmentation

The emergence of digital technology has intensified the monopoly of natural sciences, further exacerbating the divide between natural sciences and humanities. The virtual world constructed by digital means has severed the organic connection between humans and reality, reshaped the knowledge system, accelerated disciplinary stratification and knowledge quantification, thereby suppressing the subjectivity of individual knowledge workers and knowledge production systems [80]. Against the backdrop of the digital economy era, while acknowledging the benefits of digital technology for knowledge management, it is also essential to harmonize the relationship between natural sciences and humanities. A scientific approach should be adopted to

integrate scientific data with humanistic reflection, leveraging technology to better harness the autonomy, initiative, and creativity of knowledge workers, thereby promoting the diversified development of the knowledge system.

2.4.3. Technical pressure

In the digital era, technological stress can lead to knowledge hiding. Currently, organizational technological stress primarily manifests in five aspects: technology overload, invasion, complexity, insecurity, and uncertainty. Technological stress negatively impacts workplace friendships by influencing job burnout, leading to knowledge hiding among employees and thereby hindering knowledge sharing [81].

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