

Retraction

Retracted: Modeling the Empowerment Mechanism of Knowledge Collaboration from the Perspective of Platform Affordances

Discrete Dynamics in Nature and Society

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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Research Article

Modeling the Empowerment Mechanism of Knowledge Collaboration from the Perspective of Platform Affordances

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In the digital economy era, knowledge platforms have both the functions of knowledge collaboration and social media. At the same time, how to promote knowledge collaboration through platform empowerment is getting more and more attention. Since there are few types of research on how to realize the micromechanism of platform empowerment, the purpose of this paper is to take knowledge platforms as an example to study the conceptual system of platform affordances based on the social-technical perspective. Through the theoretical integration of technological empowerment and authorization empowerment, this paper provides new perspectives and future themes for explaining the platform empowerment mechanism of knowledge collaboration. As for the method, the deductive research approach is adopted in this paper. First, through the critical literature review, the gaps in platform empowerment research have been identified. Second, from the analysis of the characteristics of knowledge platforms such as Wukong Q&A and Zhihu, the relationship between platform affordances, platform organizational characteristics, and customer needs has been explored. In the final, according to knowledge platform characteristics, the conceptual system of platform affordances has been deduced. The result shows that through integrating organizational theory, knowledge management theory, and platform ecological viewpoints, the main components of the affordances of knowledge platforms have been summarized. In addition, the relevance of those components to the functions, interfaces and rules of the platform system has been illustrated, and the corresponding relationship between the affordances of the platform and the main components of authorization empowerment has been established. With regard to the implication of this study, it establishes the theoretical connection between technological empowerment and authorization empowerment and provides a more intuitive and operable method for platform empowerment of knowledge collaboration through the perspective of social-technical interaction. This paper emphasizes that starting from the mission of the platform, the stickiness of the platform can be enhanced by building platform affordances. In addition, extensive development ideas that purely pursue Internet traffic and capital need to be avoided, which is conducive to the high-quality development of knowledge platforms and the digital economy. Furthermore, this paper calls for more research on the affordances and empowerment mechanism of the platform to provide theoretical guidance for the highly unified practice of platform organizational characteristics, platform system characteristics, and target customer needs, so as to develop a more active and meaningful platform knowledge management field.

1. Introduction

Zhihu is a famous Q&A platform in China, which was founded in 2010. Wukong Q&A is a follower of the Q&A platform industry and was founded around 2016 by a famous Internet company ByteDance. In 2017, the Wukong Q&A paid a huge amount of money to sign contracts with 300

influencers of Zhihu, which caused a disturbance in the industry. However, Wukong Q&A, which once invested over 2 billion RMB in building a group of creators, stopped its operation in early 2021. During the same period, Zhihu ushered in its tenth birthday celebration and was listed on the NYSE at the end of March 2021, showing a good development trend. Thus, Zhihu became a rare winner with

Internet giants in the competition in a vertical domain in China.

“The failure of Wukong Q&A has given a fatal blow to the traffic-only theory and capital-only theory on the Internet. Internet traffic and capital can create a content platform, but they cannot give creators the fundamental element of retention, the platform ecology” (<https://tech.ifeng.com/c/83GoPKeRiGP>). In addition to the quality of user groups, platform functions, interfaces, and rules, incentive mechanisms and interactive atmosphere are all pain points for the Wukong Q&A. Relevant research also shows that Wukong Q&A has problems such as fewer topic tags, weak search engines and interactive functions, low content specialization, and low user quality [1].

In the Internet age, knowledge platforms that combine the functions of “knowledge collaboration” and “network social” have emerged, such as Zhihu and Wukong Q&A. With the opening of user registration and the import of Internet traffic, the scale of platform users has rapidly expanded, and the user group has shown an obvious long-tail structure. This is so-called the era of public knowledge production [2]. However, the huge information capacity, random insertion, and editing at any time have greatly increased the amount of information and the level of confusion. Under these circumstances, the traditional online communication methods have been changed [3, 4]. Therefore, the operation of knowledge platforms is facing a complex situation. In the face of the withdrawal of Wukong Q&A from independent operation for less than four years, it is quite important to figure out why high-quality content creators prefer Zhihu platform. In addition to Internet traffic and capital, what should be done to build a platform ecosystem?

It seems that the digital platform system can be imitated easily. In fact, the value positioning, user community, and core capabilities behind it are all ecologically evolving and nonreproducible, which can neither be obtained by capital power nor be surpassed in a short period of time. Although many studies have shown that digital technology and platform ecology can greatly impact the innovation, entrepreneurship, and strategy of users or enterprises [5, 6], these studies ignore the differences of the platform itself. It gives people the illusion that the empowerment effect can be achieved as long as they have a platform and digital technology. Therefore, in the face of the popularization of knowledge collaboration, it is necessary to crack the platform “black box” of the empowerment mechanism. It is also necessary to study the interaction relationship between the platform and users from the dimensions of core functions, interactive interfaces, and interaction rules on the basis of organizational characteristics, so as to achieve the integration of technological empowerment and authorization empowerment (in this paper, authorization empowerment refers to the traditional concept of empowerment, which is different from technological empowerment, digital empowerment, and platform empowerment.) of knowledge collaboration, enrich the theoretical system of platform empowerment in knowledge management, and realize theoretical innovation.

2. Literature Review

2.1. Knowledge Collaboration. Knowledge collaboration is the basic operating mechanism of the knowledge platform [7, 8]. Driven by questions, community users interacted based on different needs such as knowledge seeking and knowledge contribution. In this way, knowledge innovation can be promoted, and the appreciation of knowledge capital and social capital can be realized [9, 10]. The realization mechanism of knowledge collaboration is not only directly affected by user motivation, cognitive conflict, group size, content quality, and other factors [11] but also closely related to platform empowerment and incentive mechanisms.

In a lot of researches that focus on platform ecology and value cocreation [12–14], “empowerment” has received widespread attention as an essential source of cocreation value [15]. However, as a new research proposition, the discussion of platform empowerment is currently mainly about phenomenon description, concept definition, and effect verification [16]. In addition, the platform is mostly used as an intermediary connection point and ecological core node and there is a lack of analysis of the internal micromechanism based on platform personalization and differentiation [17, 18].

From a social-technical perspective, a knowledge platform is a collection of possibilities and needs of user behaviors of knowledge collaboration in social media and organizational environments [19]. Its value is not only created by digital technology but also cocreated by the interaction between the user, the technology, and the purpose of use [20]. The platform positioning and organizational characteristics determine its user empowerment method [21] and the search and aggregation method of social resources [18]. The platform system (for the convenience of discussion, this paper uses “platform” to refer to platform enterprises or platform organizations, emphasizing the role of organizations. “Platform system” specifically refers to digital software systems, emphasizing the role of products.) (including platform architecture, interaction rules, transaction and value sharing mechanism, etc.) is the technical realization of platform positioning and organizational characteristics [22], which has a high degree of asset specificity and has a dominant position in the platform ecology, so it directly determines the user experience and empowerment effect. Song and Mao [23] have already pointed out that the technological differentiation of Internet platform systems will eventually be imitated, and only organizational differentiation that continues to deepen with customer needs will remain ahead. The obstacles to survival and competition of Internet companies in a changing environment often come from the inside of the organization rather than from the outside, as shown in some studies. Under the guidance of the latter viewpoint, many companies strive to look for Internet traffic, market, and financing, neglecting to adjust their operating models better to create organizational value [22].

2.2. Empowerment Theory. In the early, the empowerment originated in the field of psychology and management has three key dimensions: structural empowerment,

psychological empowerment, and resource empowerment (Carmen et al., 2015). Recently, “technological empowerment” [15], platform empowerment, data empowerment, and digital empowerment have received widespread attention (Makine, 2006). Technological empowerment has prominent digital information technology “prints” (Hasler and Chenal, 2017) [24], and practical exploration based on digital technological empowerment has already developed before theoretical construction [25].

Most studies focus on the difference between technological empowerment and authorization empowerment, and only a small amount of literature focuses on the dialogue and integration between them. Kong [15] analyzed the core elements of value cocreation in the digital age by tracing to authorization empowerment and technological empowerment. Sun [26] pointed out that data empowerment is a kind of resource empowerment. Behind the platform system, there is a set of functions, technologies, knowledge, and rules, which are the technical realization of organizational characteristics [22]. Platform empowerment is a combination of authorization empowerment and technological empowerment, which directly determines the quality of human-computer interaction and knowledge collaboration. Kozinets et al. [27] pointed that earlier studies of consumer empowerment on the Internet were overly general and exuberant because they failed to recognize the constraining impacts of network effects, affordances, and algorithms. Mei et al. [28] pointed out that the modularity, hierarchical nature of digital platform architecture design, and the dynamic nature of platform boundary resources are the empowerment mechanism for complementary innovation. It can be seen that starting from the design of the architecture, the platform must consider how to empower users to participate in knowledge sharing and knowledge innovation, not to mention platform functions, interfaces, and interaction rules. Therefore, the platform empowerment mechanism of knowledge collaboration must be discussed from the perspective of social and technology at the microlevel.

2.3. The Theory of Platform Affordances. The platform system is constituted by the platform’s core function, interactive interfaces, and interaction rules in the digital world [29]. The core function expresses the value proposition of the platform. In addition, the interactive interfaces are a collection of user relationships, and the interaction rules reflect the algorithms and instructions for connection and interaction. The algorithm is also a concentrated expression of corporate values, value chain, and code of conduct [30]. It can be seen that a certain organizational mechanism is embedded in the platform system, and it is at the front end of user interaction, which is a functional carrier empowered by the platform. So, how to empower users through the platform system? The concept of affordances provides theoretical support for this [27].

Affordances originally refer to the support that objective things can provide for a certain behavior, that is, the possibility that things provide a certain behavior [31]. In recent years, it has become more popular in organizational research

and can be used to better understand the impact of the combination of new technologies and organizational characteristics on organizational innovation and operations [32]. “Affordance” not only provides a strong theoretical perspective for studying the relationship between technology and personnel in an organization but also provides a better language for the structured and patterned description of specific practices [33, 34].

The affordance of social platforms has an important influence on the process of organizational communication, employee and user behavior, and psychology, so it has become an important research object. Postigo [35] analyzed how YouTube guides users to conduct behaviors that are beneficial to the commercial interests of the platform through the design of platform architecture from the perspective of social-technical interaction. Rice et al. [19] defined social platform affordances as the relationship of the possibility of behavior perceived by users and the need (or purpose) aggregated in social media and the organizational environment under the constraints of the potential features or functions of the social platform. Furthermore, the affordances are critically important, and they can provide opportunities for consumer choice, voice, justice, and inclusion [27]. It can be seen that the affordance of the platform represents the integration of user needs and technology characteristics, and the strength of the affordance means the extent to which it can help users achieve their psychological goals.

3. Analysis and Result

In the era of Web 1.0, the traditional website is a one-way information release. With the in-depth application of Web 2.0 technology, the knowledge platform provides users with editable and publishable functions and permissions. In fact, it is a kind of structural empowerment in the traditional sense to transform ordinary content viewers into content producers from the institutional arrangement, which promotes the formation of the ecology of knowledge collaboration. By extension, through the combination of specific technology characteristics and users’ psychological needs, the knowledge platform forms the functional affordances of the platform and gives users the ability to achieve social actions of knowledge collaboration. This is the specific realization mechanism of platform empowerment.

So, this paper adopts the deductive method to discuss the concept of the affordances of knowledge platforms. Based on the analysis of the characteristics of the knowledge platform, the affordances theory is applied to study the concept of the knowledge platform affordances. In this way, two components of the platform affordances have been proposed: social affordances and knowledge affordances. Furthermore, the corresponding relationship between platform affordances, platform technology characteristics, and platform functions has been demonstrated. Finally, it discusses the empowerment mechanism of knowledge collaboration supported by platform affordances.

3.1. The Platform Affordances. The knowledge platform is not only an intermediary in the multilateral market but also a heterogeneous production organization with different value propositions and market positioning and different resource endowments. It is “productive” (convening and empowering socialized producers) and “intellectual” (providing industry-specific knowledge and proprietary resources), which is unique and decisive in the empowerment mechanism. Based on the social-technical perspective, affordance theory can better demonstrate the interactive relationship between Internet technology, user needs, and organizational characteristics and better understand knowledge collaboration and innovative operations under the guidance of affordances. By studying the micro-mechanism of the interaction between users and the platform, it can reveal the key elements and necessary institutional arrangements to empower users through the affordances of knowledge platforms and provide useful theoretical guidance for the realization of platform value.

The platform affordances can be divided into social affordances and knowledge affordances. The knowledge platform has accumulated two types of knowledge resources in the process of supporting knowledge seekers and contributors to achieve knowledge collaboration: “knowledge about users” and “knowledge produced by users.” The former refers to the knowledge about the user’s individual attributes, social networks, behavior patterns, etc., which are accumulated on the platform through digital interaction. It promotes the evolution of collaboration tools, user portraits, and precise recommendations, which are finally reflected in platform functions, interfaces, and rules, leading to the formation of social affordances of the platform [36, 37]. The latter refers to the knowledge collaboration outcomes contributed or completed together by users, which becomes the strategic resource accumulated by the platform, which is manifested as the knowledge affordances of the platform [22] (see Table 1).

3.2. The Social Affordances. The social affordances of the platform are the product of the interaction between the psychological needs of users and the organizational characteristics of the platform.

In the context of the Internet, corporate organizational characteristics determine the functions, interfaces, and rules of the platform system [37]. By empowering users to participate in and control platform affairs, it promotes users’ participation in value creation. This paper decomposes the organizational characteristics into dimensions such as platform positioning (mission and value proposition), resource endowments, and competition strategies and can conduct research on the matching of organizational characteristics with platform systems, thus deriving social affordances (see Table 2).

According to the research of Karahanna et al. [36], combined with the characteristics of the knowledge platform and the Chinese context of commercialization trends, this paper takes consideration of whether to sign contracts with the platform and identity differences of knowledge creators

TABLE 1: The conceptual system of knowledge platform affordances.

Knowledge platform affordances		Platform system factors
Platform affordances	Social affordances	Platform functions Interactive interfaces Interaction rules
	Knowledge affordances	Platform resources

or seekers. In addition, it determines the psychological needs, social affordances, and technology characteristics of the public to participate in knowledge sharing and knowledge collaboration, and then the correlation research is conducted (see Tables 3 and 4).

3.3. The Knowledge Affordances. The knowledge affordances are the interactive product of platform knowledge resources and users’ psychological needs. Norman [38] believes that product designers must design products based on human needs, and companies can provide consumers with valuable products only if they tap the unique attributes of their products to connect with consumer needs. The knowledge platform provides “knowledge resources,” and we believe that it also has the four characteristics of general product affordances, which are reliability, low-cost, selectivity, and uniqueness [22].

Reliability refers to the degree to which the knowledge of the platform makes users feel trustworthy and reliable [39]. If the source and content of the knowledge are reliable, users will perceive that the knowledge is of high quality [40]. Sfenrianto [41] also mentioned that information quality and trust have a great influence on online platform use. Low-cost means that the main body obtains relatively large benefits with a relatively small input, so as to meet the needs of survival and development [42]. It is also referred to obtaining a certain quantity and quality of output with the lowest resource consumption [43]. Uniqueness means that individuals pursue characteristics that are different from others by acquiring, using, and disposing of consumer goods [44]. Novelty is a concept closely related to uniqueness, which refers to the degree to which the demand side of knowledge collaboration feels innovative and brings new ideas [39, 45]. Selectivity means that people can focus on information from a specific person, group, or other sources among many resources [46].

Knowledge resources that meet the above four characteristics will become product affordances that meet the specific psychological needs of users, which can improve platform user experience and enhance user satisfaction and loyalty. Therefore, the knowledge affordances and functional affordances of the knowledge platform could cooperate with each other to realize user empowerment at the social-technical level.

3.4. The Knowledge Collaborative Empowerment Mechanism Supported by Platform Affordances. In the general sense, empowerment refers to authorization empowerment, which

TABLE 2: The matching analysis diagram of platform systems with organizational characteristics.

		Organizational characteristics		
		Value positioning	Resource endowments	Competition strategies
Example: Wukong Q&A The matching of platform system with organizational mechanism		Toutiao's collaborative creating tool (internal benchmarking Zhihu, hoping to gather high-quality users and gain new traffic)	Focusing on users in the sinking market; algorithm logic	Preferential access to high-quality creators
Platform system	Core functions	Suggesting questions, answering, reading, commenting, liking, etc.	Realizing social affordances	
	Interactive interface	Imitating Zhihu and Quora model to build the initial architecture, etc.	Realizing social affordances	
	Interaction rules	Information flow distribution, etc.	Realizing social affordances	
	Incentive measures	Signing contracts with Zhihu influencers with high salary		

means offering the ability to a specific population in a specific way, which is manifested in structural empowerment, psychological empowerment, and resource empowerment. How does the platform empower users' knowledge collaboration? The rich affordances system of the platform can fully support authorization empowerment, and technological empowerment can be used to comprehensively enhance user capabilities and promote value cocreation of knowledge collaboration.

3.4.1. Structural Empowerment. The platform treats every user as a potential knowledge contributor. Through the rich social affordances of open registration, editing, uploading, forwarding, etc., every user is able to participate in the creation and release of knowledge to achieve structural empowerment.

3.4.2. Psychological Empowerment. In order to mobilize contribution enthusiasm, the platform fully supports the realization of psychological empowerment by providing material incentives such as signing contracts and giving bonuses and spiritual incentives such as giving identity and honor, as well as ability incentives such as offering collaboration tools and offline training.

3.4.3. Resource Empowerment. The knowledge resources of the platform have the affordances of reliability, cost, uniqueness, and selectivity and provide sufficient resource support for each user.

In summary, the platform empowerment mechanism supported by digital technology is realized through the social affordances of the platform, and there is a high degree of compatibility between technological empowerment and authorization empowerment. The platform social affordances mainly play the role of structural empowerment and capacity improvement. In addition, the knowledge affordances mainly play the role of resource empowerment, and the incentive system mainly empowers the user's psychology, which fully stimulates the "creativity" and

empowerment mechanism of platform knowledge collaboration (see Figure 1).

4. Discussion

Based on the social-technical perspective, this paper puts forward the concept of knowledge platform affordances and discusses the microrealization mechanism of digital platform empowerment.

- (1) Compared with the existing research on social media affordances, this paper proposes two important dimensions of its affordances based on the dual characteristics of knowledge platform "social and knowledge": social affordances and knowledge affordances. Traditional research focuses on the affordances of digital platforms for social functions [34, 36], and some studies focus on the synergy between social and resource affordances [22]. Aiming at the digital knowledge platform, this research further proposes two important dimensions of platform affordances based on the dual psychological needs of users for knowledge and social interaction, laying the foundation for the conceptual system of knowledge platform affordances.
- (2) Compared with the existing research on platform empowerment, this paper decomposes technology empowerment into platform affordances and platform incentive and incorporates them into the three dimensions of traditional authorization empowerment, which breaks through the assumption of "black box" of platform empowerment in previous research. Most of the existing research is limited to the characteristics and performance of platform empowerment (or digital empowerment and data empowerment). It seems that as long as there is a digital platform, digital technology, or data resources, it will definitely be able to empower, resulting in the "black box" assumption of platform

TABLE 3: Research on the relationship between psychological needs and social affordances.

Social affordances		Psychological needs						
		S-NEEDS			O-NEEDS			
		A	C	HP	CK	MC	ES	R
Egocentric	Self-presentation	✓		✓		✓	✓	✓
	Content sharing	✓		✓		✓	✓	
	Interactivity	✓		✓				
Allocentric	Presence signaling							✓
	Relationship formation	✓					✓	✓
	Group management		✓					✓
	Browsing others' content	✓			✓			✓
	Meta-voicing		✓		✓		✓	✓
	Communication						✓	✓
	Collaboration		✓		✓			✓
Competition		✓					✓	
	Sourcing	✓	✓		✓			

Note: A = autonomy; C = competence; HP = having a place; CK = coming to know the self; MC = maintaining continuity of self-identity; ES = expressing self-identity; R = relatedness.

TABLE 4: Research on the relationship between social affordances and technology characteristics.

Platform example	Technology characteristics	Social affordances												
		1	2	3	4	5	6	7	8	9	10	11	12	
Zhihu	Adding, deleting, editing content												✓	
	Article discussion page		✓										✓	
	Browsing							✓						
	History pages												✓	
	Page protection												✓	
	User blocking		✓										✓	
	User talk page										✓			
	Village pump							✓						✓
	Voting features							✓		✓				✓
	Watchlist													✓

1-12: self-presentation, content sharing, interactivity, presence signaling, relationship formation, group management, browsing others' content, meta-voicing, communication, collaboration, competition, and sourcing.

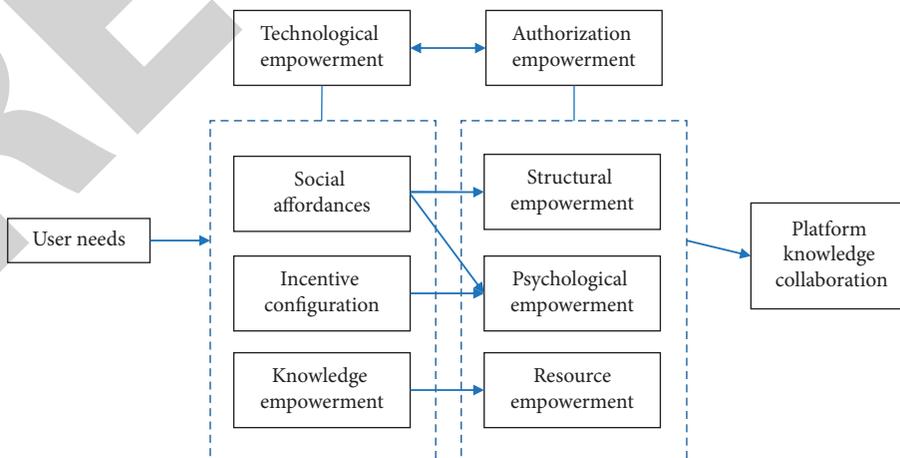


FIGURE 1: Research on the empowerment mechanism based on affordances.

empowerment research. A small number of results focus on the important impact of digital platform affordances on the empowerment mechanism [27], but there is a lack of critical bridging analysis between affordances and empowerment results. Through the research on the relationship between platform affordances and the three dimensions of authorization empowerment theory, this research has realized the important dialogue in the two fields and laid the research foundation of the micro-mechanism of platform empowerment.

5. Conclusion

The affordance theory is adopted in this paper to study the platform empowerment mechanism of knowledge collaboration and the theory of platform empowerment in knowledge management is expanded. On the background of digital technology, empowerment research mainly answers questions such as what and seldom touches on how. In 2019, Ongus [47] proved the importance of improvement on the affordances of information technology resources to match users' needs. In the context of more and more ordinary people participating in the Internet innovation, how to accurately grasp the diverse psychological needs of a large number of nontraditional users and empower knowledge collaboration in a timely and effective manner has become a core issue that knowledge platforms must face.

The theory of authorization empowerment indicates that users or employees have achieved capacity enhancement through structure, psychology, and resources. By providing functional affordances and resource affordances in accordance with mission and positioning, the platform helps users realize the integration of psychological needs, technology, and products. In addition, it realizes the empowerment of structure, resources, and psychology. Therefore, platform affordances are the technical realization of authorization empowerment and the core mechanism of technological empowerment, which helps to achieve the perfect match between technological empowerment and authorization empowerment.

This paper innovatively integrates "user-platform-organization" with the affordance theory to realize the research on the platform empowerment mechanism of knowledge collaboration. The most prominent contribution of this research is to propose the conceptual system of knowledge platform affordances and its theoretical relationship with authorization empowerment and to explore the implementation mechanism of digital platform empowerment. In this way, it realizes the aggregation of key propositions such as the matching of the organizational characteristics of the platform, platform empowerment, and incentive mechanism. It has a relatively unique research perspective and can provide a theoretical framework and management tools that can be used for reference for the value creation of knowledge collaboration and the commercial operation of the platform. The limitation is that the platform affordances and the implementation mechanism of platform empowerment proposed in this paper require further empirical testing.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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