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Business Model Innovation of IT-Enabled Customer Participating in Value Co-Creation Based on the Affordance Theory: A Case Study

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Abstract: This study uses the structured–pragmatics–situational case study approach to explore the intrinsic mechanism of enterprise digital enablement using affordance theory and how traditional enterprises enable customers to participate in value co-creation through information technology, then realize business model innovation and maintain continuous consumption. The study revealed the following: (1) Product affordance drives customers' original willingness to engage in value co-creation in four dimensions: economy, reliability, uniqueness, and selectivity; (2) The visibility, convenience, association, and persistence of the platform affordance enhance users' abilities to engage in value co-creation; (3) The interaction of affordance, structural enablement, and digital enablement drives the interaction of willingness and capability to engage in value co-creation; and (4) User participation behaviors in value co-creation can be divided into three dimensions (informational, actionable, and attitudinal participation)and four stages. The findings explain how traditional enterprises use IT enablement to promote business model innovation of customer participation in value co-creation and enrich the theories of digital enablement. The conclusions reveal the managerial implications of the ways, paths, and mechanism of business model innovation by IT enabling customers to participate in value co-creation.

Keywords: business model innovation; value co-creation; IT enablement; affordance

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1. Introduction

The digital economy is a new, quite quickly developing social and economic phenomenon; some scholars have defined the digital economy as an economic activity of people focusing on digital features [1]. As a new economic form, it will become a new driving force for economic growth [2]. Under its continuous penetration, traditional enterprises have accelerated their digital transformation to carry out business model innovation to adapt to the development of this new economic form [2,3]. From the view of strategy, business model innovation can be understood as a method of enterprise transformation, which helps enterprises adapt to the changes in the external environment; the focus is on how companies change their business models and the consequences of that change [3]. From the perspective of market orientation, business model innovation can be defined as a kind of innovation through the design of unique business systems, developing new channels or radically changing the rules of competition to meet the potential needs of consumers and to realize the rapid growth of customer value [4]. Business model innovation can also be understood as the behavioral logic of enterprise creation and transmission of value for stakeholders [5], focusing on redefining the value proposition of customers and partners [3]. In the era of the digital economy, digital enabling technology provides many possibilities for enterprises to change the methods of value creation and transmission and has become

an increasingly important technological means to promote value co-creation [6] and business model innovation [7]. In the field of marketing, digital technology helps companies redesign business models that promote consumer participation in value co-creation [8], which can enhance consumers' sense of participation and value identity, thus leading to continuous consumer and value-creating behavior and enhancing the value realization of business model innovation.

The impact of the COVID-19 has dramatically accelerated the development of the digital economy; digital transformation has become an essential strategy for many companies to cope with major emergencies. Affected by the epidemic, on the one hand, a large number of enterprises are facing a collapse in demand; some industries are facing a shortage of workers, sales are blocked, and various operating pressures have led to many enterprises facing the risk of bankruptcy, and some have even been forced to close down; in particular, some small- and medium-sized enterprises have had greater pressure to survive. On the other hand, during the epidemic, some industries not only were not adversely affected, but also developed rapidly, for example, contactless distribution, the sharing economy, online education, etc. At the same time, there are many enterprises actively trying to innovate business models based on digital technology, such as online offices, sharing staff, and so on, thus successfully tiding over the difficulties. Thus, what is the secret for these surviving companies to cope with sudden changes in the external environment through digital business model innovation? How does information technology play a role in business model innovation? The underlying mechanism of IT enablement to promote business model innovation is still a black box mystery that needs to be solved [9]. Although this issue has aroused extensive concern of the industry and academic circles; for example, Du sees information technology as a mediating variable from business exchange to customer value output and states that information systems enable customer value co-creation [10], but the knowledge of it is still limited. Many managers of companies do not understand [6] how digital technology reshapes business models and enables customers to participate in value co-creation. The aim of this study is to try to use affordance theory to solve the puzzle of digital empowerment, and to explore the inherent logic and path of business model innovation in which technology empowerment can promote customer participation in value creation.

To understand the driving effect of information technology change on business model innovation and the internal mechanism, path, method and mode, and the connotation and realization of digital empowerment, more abundant and in-depth research is needed. Therefore, this paper mainly focuses on the following questions: How can business model innovation based on value co-creation through it enablement for traditional enterprises be promoted? How do digital technologies promote value co-creation? How does IT enable value creators: its ways, means, paths, and mechanism? In order to resolve the above issues, this study used the structured–pragmatics–situational (SPS) case study approach, which is based on affordance theory [11,12], to explore how traditional enterprises enable their customers to participate in value co-creation through information technology, and what capabilities have been enabled to facilitate value co-creation and then achieve business model innovation based on digital transformation.

Compared with existing value co-creation solutions, this study focuses more on consumer participation and identity transformation, for example Web 2.0 and crowdsourcing. Web 2.0 technology provides a virtual platform, based on which value can be co-created through interaction between producer and prosumer (active consumer) [13–16]. The focus here is on the promotion to value co-creation from the interactive scenarios provided by the technology platform. Crowdsourcing can be understood as a dynamic behavior of value co-creation and an effective means for enterprises to launch open innovation [17]. Its main features are multi-agent interaction and dynamic role transformation based on the project [18,19]. The role transformation of value co-creators based on crowdsourcing is obviously dynamic and random [18], and external individuals participate in value creation dynamically. The identity transformation of customer participation in value co-creation

mentioned in this study is relatively stable, which is the transformation from consumer to entrepreneur. There is a phenomenon that external subject internalizes into supply chain partner, and its form and content are different. The findings reveal that how traditional enterprises use IT enablement to promote business model innovation of customer's participating in value co-creation. The contribution is enriching the theories of digital enablement and value co-creation and providing fresh insights into the methods, paths, and mechanism of business model innovation through IT, enabling customers to participate value co-creation.

2. Literature Review

2.1. The Affordance Theory

The concept of affordance originally referred to the support that an object could afford a behavior, that is, the possibility that the object affords a certain behavior [20]. Norman, who conducted extensive research in the field of technology design and human–computer interaction (HCI), pointed out that affordance is not only a property of an object perceived by an actor during its use but also a dynamic relationship where the existence of affordance depends on the relationship between the actor and the attribute [21]. Majchrzak and Faraj also defined affordance as the interrelationship between an actor's intentions and technological capabilities that affords possibilities for specific actions, emphasizing the symbiotic relationship between human actions and technological capabilities [22]. Postigo adopted a socio-technical interaction perspective in analyzing how YouTube guides users to act in favor of the platform's commercial interests through the platform's architectural design [23]. Therefore, technological affordance is understood as the human behaviors that technology affords.

The concept of affordance is gaining popularity in organizational research. It is widely used to study the relationship between technological products and organizational interactions and demonstrate how tools or technologies afford different interaction patterns [22]. The concepts allow a better understanding of how the combination of new technologies and organizational characteristics affect organizational innovation and operations. "Affordance" not only provides a powerful theoretical perspective for studying the relationship between technology and people together in organizations but also a better language for structured and patterned descriptions of specific practices [24].

Treem and Leonardi proposed four dimensions of affordance, namely visibility, association, editability, and persistence, which are widely used [24,25]. Later, Treem and Leonardi, Leonardi et al., and Oostervink et al. proposed five dimensions of affordance: visibility, selectivity, attention, persistence, and editability [25–27]. Shengping et al. proposed product affordance and platform affordance by combining the basic characteristics of Internet enterprise products and platforms [28]. They classified product affordance into four attributes, namely reliability, economy, selectivity, and uniqueness; and platform affordance into four attributes, namely visibility, convenience, association, and persistence. Zhian and Julin explored the realization of platform affordance in terms of both technical affordance and social affordance and emphasized the importance of considering users' perceptions and actions when gaining insight into the complex relationship between technology and society [28,29]. The study divides affordance into product affordance and platform affordance to analyze the mechanisms inherent in traditional enterprises' enablement of customers to participate in value creation with the help of digital technology.

2.2. IT Enablement and Value Co-Creation

According to the different ways and means of enablement, the current research has studied characteristics such as data empowerment [30] and technology enablement [31]. Although they have different names, they all refer to the enablement of specific people through big data, the Internet of Things, mobile Internet, cloud computing, artificial intelligence, and other digital technologies [8]. Therefore, this study will collectively refer to them as IT enablement, which is, enabling people by means of information technology, making

the "impossible" "possible". As a mode of digital transformation, IT enablement can reconfigure individual customer identity and enhance customer self-efficacy and skills [32]. It can improve individual entrepreneurs' information and communication skills, enhance business awareness and capabilities [33], and enable consumers to create greater value for other consumers [6]. The main dimensions of digital enablement are psychological enablement and organizational enablement [34]; structural enablement, resource enablement, and psychological enablement [35]; and employee enablement and customer enablement [36]. The core elements of enablement in value co-creation networks in the digital technology era include information sharing, open architecture, and collaborative rules [37]. How much people master information technology determines the amount of information possessed and their new experiences [38]. Big data technology drives consumer participation in the value creation of data, products, and services, enabling value co-creation between consumers and businesses, between consumers, and between businesses [39]. The internal and external enablement of organizations has become an important driving force for platforms to achieve value co-creation [37]. IT platforms are collections of relationships in which user behavioral possibilities and needs or purposes are aggregated in social media and organizational environments [40]. Digital platforms, as "extensible code bases based on software systems," constitute the core functions, interaction interfaces, and interaction rules of platforms in the digital world [41]. Digital technology enables (1) customers through platforms that can accurately identify customer needs; (2) connectivity, where supply chain parties are flatly integrated; (3) services, which further enable transactional interactions and financial security service integration [42]; and (4) data-driven and human–machine collaboration [43]. Kong et al. provided cross-level analysis of enablement in a framework integrating value co-creation and business model innovation [37].

The development of value co-creation theory has gone through three stages: value creation centered on product-oriented logic, value creation centered on service-oriented logic, and value creation centered on customer-oriented logic [44,45]. In the field of value co-creation studies based on customer-oriented logic, the existing literature primarily focuses on the value co-creation of customer participation in product innovation [46], information sharing, and co-operative behavior [47,48]. With respect to customer participation, there is insufficient research that subdivides specific actions of customer value co-creation, little research that incorporates consumer entrepreneurial actions into the value co-creation dimension has been found, and research on how customer participation in value co-creation has become a stable link in the supply chain, such as a customer turning into a distributor, is rare. In addition, although there are many documents discussing how platform companies can achieve value co-creation through digital empowerment, there are few studies on traditional enterprises achieving value co-creation in the process of digital transformation and ITenablement.

It can be seen from the above literature research that it is necessary to have a clear theory to clarify the internal mechanism of IT enablement, so as to solve the logic of IT enablement promoting value co-creation; and it should be put into an integrated framework to study value co-creation and business model innovation. Theoretically, the affordance theory will provide a basis for us to reveal the internal workings of IT enablement, and the literature [37] will provide a good reference for us to build the overall framework of value co-creation and business model innovation. In summary, it is widely recognized that IT can facilitate value co-creation [10]. However, the intrinsic mechanisms of how IT enables value creation participants, its ways, means, paths, and the mechanism through which technology confers capabilities to value creators, are not well understood.

This paper uses the SPS case study approach with a maternal and infant product manufacturing and distribution company to understand IT enablement and explore the inner logics of technology enablement. The conclusion about the behavior classification and evolution stage of customer participating value co-creation provides fresh insights for enterprises, which can help them design digital technology empowerment schemes

pertinently and improve the participation of customer value co-creation to promote digital business model innovation.

3. Research Design

3.1. Research Framework

Based on the theory of affordance, and by referencing "affordance–interaction–realization" [28] and integrated frameworks of business model innovation and value co-creation [37], this study explores how companies enable users to participate in value creation through digital technologies or platforms and stimulate customers to participate in value co-creation from a socio-technical perspective. The research framework is shown in Figure 1.

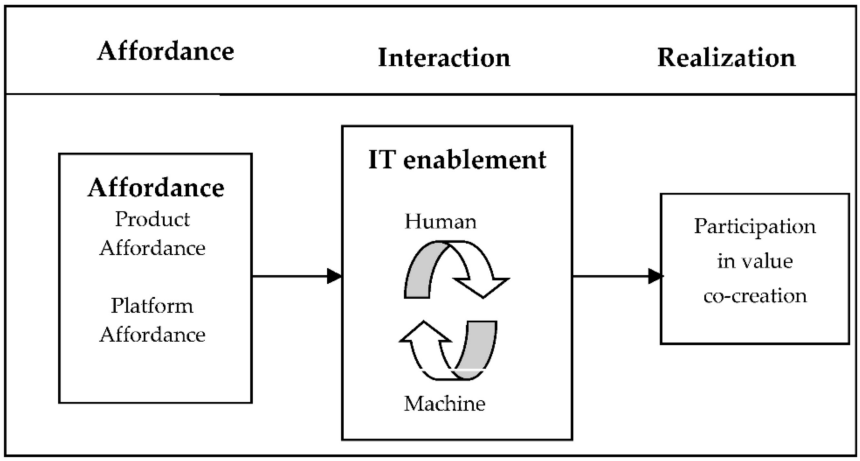

Figure 1. Framework for research on IT enablement based on affordance theory.

There are three key elements in the systematic framework of business model innovation and value co-creation: customer (WHO), value proposition/work or activity (WHAT), and value network (HOW) [37]; therefore, this paper will mainly discuss the evolution path of business model formed by customers (WHO) participating in value co-creation activities (WHAT) and role changes (WHO) through a technological platform and interactive network (HOW).

3.2. Methodology

Based on the type of research question, the SPS case study approach was chosen for this study [8,28]. The SPS case study approach is a type of structured–pragmatics–situational case study using the phenomenon conceptualization, semi-structured interview, in-depth observation, and second-hand data. Unlike grounded theory, this is a case study method with a preset framework and a guiding interview outline. The methods of data-collecting include text investigation and phenomenon observation, semi structured interview, in-depth observation, and open data collection. Herein, the purpose of text investigation and phenomenon observation is to generalize and form the initial framework by collecting information about the phenomenon, although it is open observation without a framework, and then based on the preset framework to design the guiding interview outline for the semi-structured interview. In addition, through the in-depth observations of researchers and the collection of public data in other ways at any time, the information of interviews was verified from different perspectives, and the research concepts and dimensions were summarized based on the data coding and theme analysis.

Based on the above and the diverse qualitative data collected from the above channels, this study conducted qualitative data analysis referring to the research of other scholars [12,49]. They put forward that the qualitative data analysis method is not only phenomenon driven, but it is also a process of repeated comparison between data and

theory. In order to avoid researchers' misunderstandings, data analysis usually should include more than two researchers to analyze the interview records, independently looking for regular similarities and differences, and then an agreement should be reached according to the classification of the interview data (words of the interviewees), and then theme (second-order) and aggregation structure formed. In this paper, through repeated abstraction from phenomenon to concept and comparison of initial theory and phenomenon, and through back-to-back coding of qualitative data and theme analysis by many researchers, the initial conceptualization of phenomenon was formed, and the comparison theory of initial conceptualization was summarized to form a secondary concept (dimension). The second level concept was induced and matched with the first level concept (construction) in the initial framework.

This study mainly conducted three strategies to ensure the reliability of qualitative data [50]: (1) ensure the reliability of data-collecting; (2) ensure the reliability of data-coding and analysis; (3) obtain confirmation from insiders and repeated approval by interviewees and observers. Although the number and length of formal interviews were limited in the sample data collected in this paper (this is just a small part of our overall research program), the study continued to follow the case enterprises for up to two years, and in addition to individual interviews, there were many other ways of obtaining information on the same questions at different times to ensure consistency of answers. These include the researchers' participatory practices and in-depth observations, such as two years of follow up and in-depth observation of the 1700-person Miffy team, as well as access to official archives and public records from other non-interview text, videos, and other materials to find evidence. By comparing different data over and over, the reliability of qualitative data was verified. Regarding data-coding and analysis, through the coding and interpretation of data by different researchers, common ground was found to ensure the accuracy of data analysis. Finally, on the one hand, insiders were asked to confirm the authenticity of the data; on the other hand, the results of the initial conceptualization were interpreted and sent to interviewees and observers to confirm whether the conceptualization truly reflected the original intent of the data.

3.3. Case Selection

The organizations were selected in the study based on three major criteria [49]: company representativeness, content suitability, and data availability. In this study, the selection of the brand Qianzhiya's Miffy (maternal and infant products) and its Cloud Warehouse system was based on the above criteria, especially the case's representativeness and uniqueness. Firstly, Qianzhiya Sanitary Products Co., Ltd. is a national high-tech enterprise established in 1998 integrating research and development (R&D), production, sales, and operation. Its business scope reveals that it is considered to be a traditional industry. Secondly, Qianzhiya began using the new retail and China's first new retail management application platform, Cloud Warehouse, in 2017; therefore, it is unique and representative of traditional enterprises' digital transformation. Its operation center, Millclub, proposed a series of plans to enable customers, including the wealth plan of "creating a 10 billion mothers entrepreneurial platform," which is very distinctive, as it enables the particular group of pregnant mothers through the Cloud Warehouse system and other information technology and realizes the co-creation of customer value.

3.4. Data Collection

The case data were primarily collected through individual interviews, observations, and secondary sources.

First, individual interviews were conducted using a semi-structured interview method. The first step in the method involved developing an interview outline and interview plan based on the initial theoretical framework, which referenced the affordance theory. The second step consisted of finding interesting points and conceptualizing them through individual interviews with Miffy agents and clients to form coding nodes for the interview

data. In the third step, follow-up interviews were conducted to obtain detailed information, data were analyzed, and the initial framework was revised. The final step included summarizing and organizing data to form constructs and their dimensions and exploring reasons for the intrinsic logical relationship between the constructs. Before conducting the semi-structured interviews, a detailed interview outline was prepared according to the research framework and model (see Appendix A for the guiding interview outline). The interview outline was supplemented and adjusted promptly according to the problems identified during the interview process. The questions in the guiding interview outlinewere mainly set up around the initial concept of the research framework: product affordance, platform affordance, participation in value co-creation, and IT enablement. The researchers interviewed 15 interviewees, and a total of 17 h of interview records about enterprises, products, technical support, training, participation behavior and motivation, feelings, and experiences were collected (Table 1). In addition, after the interview, the interviewees also provided a large number of documents and videos.

Table 1. Basic information about the interviews.

No.	Interviewees	Number of People Interviewed	Length of Interview (Hours)
1	Senior Agent	1	1
2	Senior Agent	2	3
3	General Agent	3	2.5
4	Team Leader	1	2
5	Senior Agent, Partner	2	3
6	Senior Agent	2	1
7	Team Leader	1	1.5
8	Senior Agent	1	1
9	Senior Agent, Team Leader	2	2

Second, to conduct hands-on observation, the researcher registered as a Millclub member and purchased Miffy maternal and infant products produced by Qianzhiya as a customer to establish a close relationship with Miffy agents. Data collection was conducted through hands-on practice, experience, and in-depth observation. As one of the observed objects, researchers participate in their value co-creation activities, which increases the reliability of the information obtained from in-depth observation to a certain extent and is conducive to multi angle verification of the information collected from semi-structured interviews.

Third, secondary information and public information, such as documents and videos, were collected through the official website of Qianzhiya (hzqianzhiya.com, accessed on 10 November 2019) and the Millclubapp as well as enablement centers, journals and magazines, industry reports, news media, the Millclub official business school, internal corporate information, information shared by Millclub agents, and other means.

After collecting data through the methods mentioned above, a variety of forms of first-hand information, including documentary materials, pictures, and audio/video materials, were obtained.

4. Case Description

4.1. Case Overview

The national high-tech enterprise, Qianzhiya Sanitary Products Co., Ltd., has 37 production lines, more than 500 acres of land for construction, and three production bases: Tonglu Production Base, Hubei Production Base, and the Intelligent Manufacturing Base. It has established the SOLOVE Global Maternal and Infant R&D Center, the Hangzhou Qianzhiya-Zhejiang University High Water-Absorbent Materials R&D Center, production and manufacturing centers, logistics centers, warehousing centers, global customer service center, and other institutions.

4.2. History of the Enterprise

The Shutai Sanitary Products Co., Ltd., Fuyang, China, was established in 1998. The first adult diaper production line was introduced in 2003, and soon after, the brand "Qianzhiya" was founded. In 2010, the full-servo baby training pants production line was introduced in Japan. In 2011, the Qianzhiya Sanitary Products Co., Ltd., Hangzhou, China, was established; in 2016, the Dutch animated character Miffy was introduced to endorse the SOLOVE brand, and Millclub Technology Co., Hangzhou, China, was established as a wholly-owned subsidiary. In 2017, the enterprise developed the first domestic new retail management application platform, Cloud Warehouse, to break into new retail. In 2018, the enterprise established the SOLOVE Global Maternal and Infant Products R&D Center and drafted and released the "Made in Zhejiang" baby diaper industry standard. The strategic vision of the enterprise was to share healthy hygiene care with the world. It built an entrepreneurial platform through a wholly-owned subsidiary and uses the Internet as a base, upgrades the distribution and sales process of goods through advanced technological means such as the Cloud Warehouse system, and engages in new retail to support pregnant women and mothers who take care of their babies full-time to start their own businesses.

4.3. Case Data Analysis

Data analysis was conducted through multi-level coding [51], with bottom-up spiral theoretical abstract, contrast against the initial framework, and two-way concept-focused theory building. In this study, the research framework was used as the basis for conceptualizing the case information, identifying basic coding rules and conceptualizing abstraction from the information evidence to form the measurement dimensions corresponding to each construct of the initial framework (Table 2). In detail, the main coding methods were open coding and axial coding. Open coding refers to determining the important themes and concepts hidden in the data based on a comprehensive understanding of the depth and breadth of the data by reading through the original data without a predetermined code table, which mainly involved the original data's shrinking, merger, conceptualization, and categorization [52]. This study first used open coding to extract the initial categories in the original data, and then identified the nature of the categories and the relationships between the categories [53] to form initial conceptualization. Then, the axial coding method was used to discover the internal relationship between the initial concepts, and then form a second-order abstraction (dimensions) through repeated comparison with the constructions from the original framework. Four main dimensions were separately abstracted around the themes of product affordance and platform affordance, three dimensions were formed around the themes of value co-creation participation, and two dimensions were found around the themes of IT-enablement.

Table 2. Conceptualization of case information.

Construction	Dimension	Conceptualization	Explanation of Case Information
Product affordance	Reliability	Safe and reliable	The product development process prioritizes safety, maximizes efficacy, and emphasizes comfort. Raw materials are from the world's top 500 enterprises. To fully guarantee the quality of products, production is monitored in real-time through 4K HD online monitoring. The company also won the CBME Corporate Social Responsibility Award.
	Economy	Discount pricing	Become a member to purchase at a discounted price. Become an agent with zero agent fees to earn retail profits. Recruit members to earn spreads, system rewards, and monthly dividends.
	Selectivity	Full range of products	All categories of maternal and infant care products. More than a hundred categories such as diapers, pull-ups, diaper pads, toiletries, wet wipes, soft tissues, masks, and learning cups.

Table 2. *Cont.*

Construction	Dimension	Conceptualization	Explanation of Case Information
	Uniqueness	Product features	Diapers are designed to maintain a temperature of 36.8 degrees Celsius, have a fully absorbent core, dry easily, be soft and breathable, and have good absorbency.
Platform affordance	Visibility	Visibility	The data on the Cloud Warehouse system are visible at all times. Product additions, pickups, shipments, order management, and revenue management are all visible.
	Convenience	Simple and convenient	Fully automatic order system. One-click order placement, with all orders and delivery, order status, profit settlement and clearing, and customer ownership being managed by the system. Multi-warehouse system mode, warehousing services, and platform sharing. Inventory levels are visible and can easily be shared.
	Association	Multi-party interconnection	The new retail platform combines online and offline retail. The shipping is free for all products, and they are sent directly from the factory to save on logistics and transit costs. The Cloud Warehouse system is used to achieve multi-party interconnection of production, sales, logistics, and customers.
	Persistence	Long-term preservation	The data from the Cloud Warehouse system are permanently stored for long-term traceability.
Value co-creation participation	Informational participation	Proactive sharing	Sharing of product usage experience or entrepreneurial experience through multiple channels such as friends, Mill club community, self-built teams, and fan festivals.
		Teamwork	Proactively participate in team sharing, provide feedback, and answer questions from other team members.
	Actionable participation	Agent business	Become a Miffy agent and start a business, in addition to purchasing the products for personal use.
		Leading the team	Actively recruit members and take the initiative to form your own entrepreneurial team.
	Attitudinal participation	Value recognition	The agents agree with Miffy's model and values and believe that they benefit greatly from participating as a Miffy agent.
		Value output	It mainly refers to training output such as training other newcomers as an instructor and proactively mentoring or leading new team members in their business ventures.
IT enablement	Structural enablement	Establishing a network	Through the Cloud Warehouse system, customers, agents and factories, and warehouses establish a network of visible connections, allowing them to browse product information, make pickups and deliveries, and check inventory changes and incoming revenue anytime and anywhere.
		Operational convenience	The Cloud Warehouse system allows the integration and cooperation of warehouse, transportation, and distribution. All the agents' incoming and outgoing deliveries and distribution can be completed in the Cloud Warehouse system, which avoids the burden of filling the offline waybill and sending express. It can quickly realize online sales and distribution on the mobile side, which is easy to operate, improves business convenience, and lowers the entry threshold.
		Supply chain flattening	The Cloud Warehouse system provides a mobile management platform for online shopping malls, shopping carts, sales channels, order management, multi-warehouse models, and other logistics and capital flows. Product sales and channel management are realized through mobile phones, and the supply chain is shortened.

Table 2. *Cont.*

Construction	Dimension	Conceptualization	Explanation of Case Information
		Expanded scope of resources	Millclub provides agents with an online Miffy material library, product details, new product training, factory live streaming, brand stories, product FAQs, and other learning resources. The material library can be used directly for marketing promotion and one-click sharing. Agents can attend the directly-managed and online Miffy International Team Business School, which provides a wealth of online courses. The company organizes study tours of Peking University for senior agents.
	Resource enablement	Expanded resource sharing	The company organizes various online and offline training activities to help newcomers get started and become excellent sales agents. After participating in the study tour, the agents combine their practice of selling Miffy to apply the lessons learned and then use live classes to train other agents. The company organizes elite training camps, which combine online and offline courses and team-based classes. After the classes, agents must share their learning experience and complete homework to create a learning atmosphere and improve their sales abilities. The training content spans a wide range, including high emotional communication, avoiding sales pitfalls, offline training, reading famous books, crisis thinking, and capitalizing on opportunities during crises. The company also organizes an annual fan-sharing festival and opportunities for agents to share their entrepreneurial experiences.

It can be seen from Table 2 that product affordance is divided into four dimensions from the attributes of the product itself, namely reliability, economy, selectivity, and uniqueness [24,25], which refer to the possibilities provided by the product to the user. Platform affordance mainly refers to the possibilities provided by the IT platform to the user and can be divided into four dimensions: visibility, convenience, association, and persistence [27,28]. Product and technology platforms provide the basis for customer perception and experience, and organizations form interactions with customers through IT enablement with the help of IT platforms. Customers' experience-based human–computer interactions(HCIs)enhances customers' abilities to participate in value creation and inspires customers to participate in value co-creation. The value co-creation participation behavior of customers in the case, based on the Cloud Warehouse system platform, has obvious IT-enabled value co-creation, and therefore, the dimensions of customer participation in value co-creation are divided into informational participation, actionable participation, and attitudinal participation [54,55]. Moreover, IT enablement dimensions are divided into structural enablement and resource enablement regarding digital enablement dimensions [35].

5. Case Findings

Based on the case study, this study attempts to answer how traditional enterprises can achieve customer enablement and promote customer participation in value co-creation through information technology, understand the concept of enablement, as well as clarify how to enable customers and what capabilities can be enabled to promote customer participation in value co-creation. Through the case study, we discovered the following:

5.1. Product Affordance Triggers Willingness for Customer Value Co-Creation

Product affordance allows users to access the platform for enterprise IT enablement from the product's characteristics (Figure 2). Economy is one reason that attracts ordinary users to purchase, but the continuous purchase behavior must be based on the precise matching of needs and the enhancement of user experience. The users will try the product for a reasonable price and access the enablement platform for the first time, but they will not become agents just because of the discount pricing offered. In contrast, the product

quality is more likely to encourage users to continue buying and participate in value co-creation. The safety, reliability, and uniqueness of maternal and infant products are essential characteristics of demand-oriented products and dovetail with customer needs. If the product does not meet the safety and reliability and specific needs alignment, trust cannot be built between the customer and the product, and the willingness to participate in value co-creation will not be stimulated. Selectivity, on the other hand, provides the possibility for customers to participate in value co-creation from another level, that is, the more complete the category, the higher the expected benefit of participating in value co-creation, which will further enhance the user experience and promote the willingness to participate in value co-creation. Thus, product affordance provides the possibility for users to access IT enablement. Users' continuous purchase is triggered through reliable product quality and unique product features, which builds trust through continuous purchase and establishes the foundation for users to participate in value co-creation. Simultaneously, the multi-category selectivity of products stimulates users' willingness to participate in value co-creation. The following are a few examples from the case study:

> Product economy provides access: *"My friend recommended that I join Miffy. At first, I was not interested like most mothers . . . The first thing I thought about was self-use, and I did not think about being an agent. After a long time, I realized that having a baby is expensive and that milk powder, diapers, and all kinds of supplies are indispensable. However, we are not well off, so I wanted to reduce expenses. In order to give the baby better living conditions and give me a better quality of life, I became a Miffy agent."* (Information shared from agents in the community)
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> Product features enhance the experience, and selectivity stimulates co-creation: *"I had never heard of this brand before, the confinement center sent me a trial pack, and I thought it was pretty good, so I kept using it. After using more, I realized that they have quite a lot of products" and"This is my seventh factory trip, and I get something new every time."* (Senior Agent) *"Choosing Miffy products helps save a lot of time spent choosing and comparing products; the Cloud Warehouse has everything you want"* (Advertisement from agents)
>
> Uniqueness achieves needs alignment: *"My baby has sensitive skin, was born in the summer, and often has red buttocks. I saw my friends sharing that Miffy diapers maintain a temperature of 36.8 degrees, so I bought them to try."* (General Agent)
>
> Reliability and uniqueness prompt continued purchase: *"I started using Miffy's after I had my second baby, and after comparing them, I think the 36.8 degrees design is good. The diaper has no lumps and is soft and absorbent, so I have been using it ever since."* (Senior Agent)

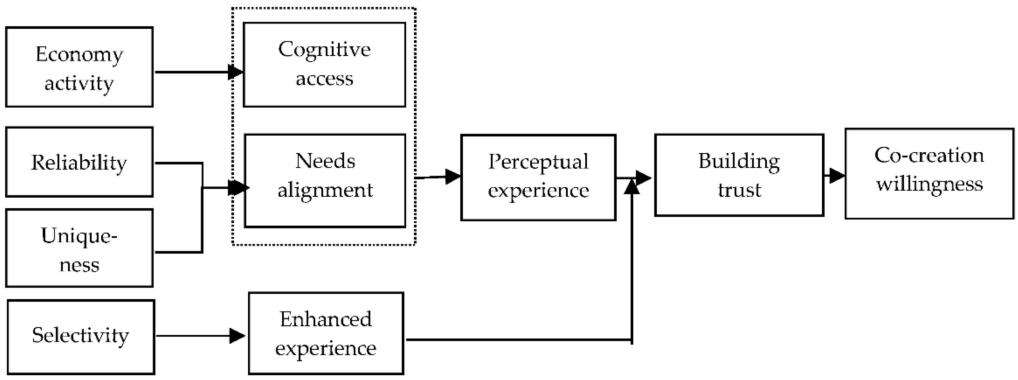

Figure 2. Mechanism of product affordance.

Finding 1: Product affordance triggers the original willingness of customer value co-creation from four dimensions. Product economics provides the inducement for users to access the product system. The product's reliability and uniqueness establish the

customer's perceived experience of using the product by targeting its needs. Product selectively provides the user with scenarios that enhance the experience of meeting the user's specific needs. A good experience is a prerequisite for users to establish trust in the product and the brand. Establishing trust is a prerequisite for users to generate co-creation willingness. The stronger the trust of users, the more likely they are to generate the willingness to participate in value co-creation.

5.2. Platform Affordance Enhances Customer Value Co-Creation

Platform affordance is an important vehicle for IT enablement to enhance customer capabilities (Table 3). In this case, the Cloud Warehouse system provides customers with a visible way to search for resources, a rich platform for querying and using product materials, visual order management, and visual revenue management. The convenience of the Cloud Warehouse system's operation, especially the reshaping of the supply chain structure (Figure 3), dramatically reduces logistics and capital flow. Its effectiveness lies in improving the efficiency of the supply chain operation, but the real significance lies in the logistics handling capacity of the disadvantaged groups. The buyers and agents of Miffy's maternal and infant products are mostly pregnant women and mothers with infants. This group is temporarily unemployed (1) due to health reasons and baby care, (2) as their income is affected, (3) or as they are temporarily disconnected from society on account of having to take time off for pregnancy and baby care. Thus, they are a disadvantaged group with multiple physical, economic, and psychological pressures. They cannot handle packing and shipping independently and do not have enough time to deal with financial data and product management. The factory-direct shipping and online visual order and financial management of the Cloud Warehouse system and the rich product materials make it convenient for this group to start their own business and effectively solve the operational problems they face in starting their own business. Furthermore, the platform builds a flat communication network for the participating pregnant women and mothers through structural enablement, enhancing their social skills and social identity. The following are a few examples from the case study:

> *"Within 15 min, agents can place an order online, check that the item has been shipped, and try to add a sample item. The old micro-business model relied on stocking up large amounts of inventory and doing the packaging and shipping all by yourself."* (Senior Agent)

> *In 2017, Qianzhiya pioneered the use of the Internet and big data, creating the first Cloud Warehouse system in China, with "cloud storage, one-click order placement, automatic delivery, and automatic settlement," connecting the online and offline, and using the big data platform for management and analysis. We have achieved "zero inventory, zero labor, and zero cost" for agents and distributors through this system.* (Official website)

> *In 2017 Miffy launched the SOLOVE Maternal and Infant New Retail Wandian Project, forming an omnichannel new retail layout of online + offline + experience stores.* (Official website)

Finding 2: Platform affordance enhances users' abilities to participate in value co-creation in four dimensions. Platform visibility enhances customers' information search abilities, product and order management abilities, and revenue management abilities through resource enablement. Platform convenience builds connection networks for users, enhances their business operation capabilities, and enables their entrepreneurial capabilities. Platform association enables a flat supply chain structure through structural enablement, enhancing users' logistics and business socialization capabilities. Platform persistence enables long-term preservation of operational data through resource enablement, which improves users' resource utilization capabilities and data-based decision-making capabilities.

Table 3. Customer abilities enabled by the platform.

Platform Affordance	IT Enablement	Customer Capabilities Enabled
Visibility	Resource enablement	Improve customer search capability, product management capability, order management capability, and revenue management capability.
Convenience	Structural enablement	Focusing on disadvantaged groups, we enhanced our customers' business operations by establishing a connection network and improving the efficiency of our customers' sales operations through integrated warehouse, transportation, and distribution synergies, enabling disadvantaged groups to start their own businesses.
Association	Structural enablement	The platform helped achieve multi-party interconnection. Flattening of the supply chain saves transaction costs and improves efficiency while enhancing customers' logistics, business processing, and business socialization capabilities.
Persistence	Resource enablement	Long-term retention of operational data improves customers' data sensitivities and data-based decision-making.

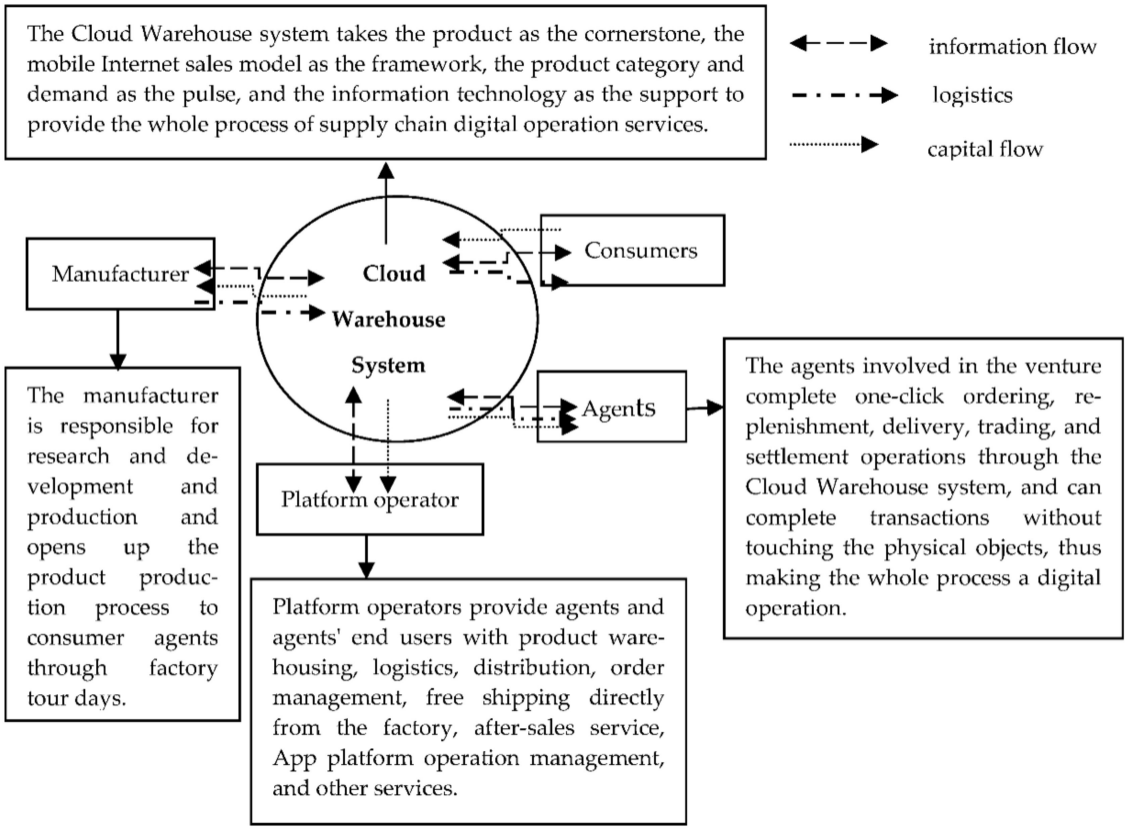

Figure 3. Flattened supply chain based on the Cloud Warehouse system.

5.3. Platform Affordance to Achieve the Transformation of the Supply Chain into a Front-To-Back Flat Supply Chain

In the case study, the Cloud Warehouse system is the visible carrier of IT enablement (Figure 3). The enterprise, in this case, was able to have a close connection between the technology platform and customer needs by building the Cloud Warehouse system. Through the visibility, convenience, association, and persistence of the Cloud Warehouse system, a flat digital operation platform based on maternal and infant products, supported by information technology, and precise alignment of needs was realized. The flat supply chain and full-process digital operation have also been realized through this platform. In

the traditional supply chain, logistics covers the whole chain of the supply chain, with the manufacturer shipping the finished products to the downstream distributors or agents, who then ship them to the final consumers. Agents need to manage their own inventory and handle the logistics business from ordering, replenishment, and shipping and paying the corresponding costs. In the supply chain with the Cloud Warehouse system as the core, IT enablement liberates the agents. The logistics only occurs at the beginning and end of the supply chain. The other intermediate links are digital virtual flow, which means that the manufacturer deposits the finished products in the factory warehouse (here, the logistics flow is internal or short-haul flow). After the agents place orders through the Cloud Warehouse system, the platform operator coordinates with the factory to ship directly to the final consumers free of charge according to the order data. Here, the final stage is where the actual physical flow occurs. The overall efficiency was dramatically improved, and the problem of handling inventory and delivery of particular groups of agents was effectively solved.

Finding 2a: Through the Cloud Warehouse system with the four characteristics of visibility, convenience, association, and persistence, the platform reshapes the structure of the supply chain, enabling users through digital operations.

5.4. Interaction of Structural and Resource Enablement for Value Co-Creation

The product achieves access to platform users through needs alignment. The platform is a carrier for users to achieve structural enablement. The connection network built through the platform provides technical support for resource sharing. The platform's convenience provides a convenient business operating environment for co-creation participants, enhances the ease of use of the platform, dispels the fear of difficulties of value co-creation participants, and increases participants' willingness and ability to participate (Figure 4). As Xuecheng concluded, the platform support's quality positively influences participants' sense of self-determination, promoting value co-creation behavior [56]. The Cloud Warehouse system of the case company serves as a platform that provides convenience and scenarios for interactions and resource sharing among consumers involved in value co-creation through features such as multi-party interconnection, visualization, and storability. Most importantly, the supply chain reshaped by the Cloud Warehouse system is wholly flattened and structurally enabled. This change in operation mode promotes more convenient resource sharing and business collaboration. Information technology drives structural affordance at the infrastructure level and resource sharing at the application level. The structural and resource empowerment based on platform affordance forms an interactive cycle of mutual dependence and promotion in HCI. The interdependent interaction with product and platform affordance is closely linked, effectively promoting consumers' willingness to participate in value co-creation and enhancing their value co-creation capability. Consumers, in turn, inject new energy and resources into the operation of the platform, and value co-creation participants from diverse industry backgrounds and educational experiences bring their knowledge and resources from their respective fields. Combining these factors with the co-creation scenarios and businesses triggers a broader range of resource development and sharing. The following are a few examples from the case study:

> *"The company has a great product. I share it because I've used it. That's why I'm doing this."* (General agent)
>
> *"The Cloud Warehouse system brings us a lot of conveniences. We don't have to fill out our own waybill, pack, and send out our own courier. Otherwise, I would have to take care of two small children and have no time to deal with these."* (Senior Agent)
>
> *"There is a wealth of product materials on the company platform that can be downloaded and used at any time, it's easy to learn, and anyone can operate it."* (Senior Agent)
>
> *"We have people from all walks of life in our team: doctors, engineers, self-employed, teachers, and full-time mothers in remote mountainous areas. The more we communicate,*

the more we find that we are all very good, and it is very rewarding to start a business with such a group of people." (Partner)

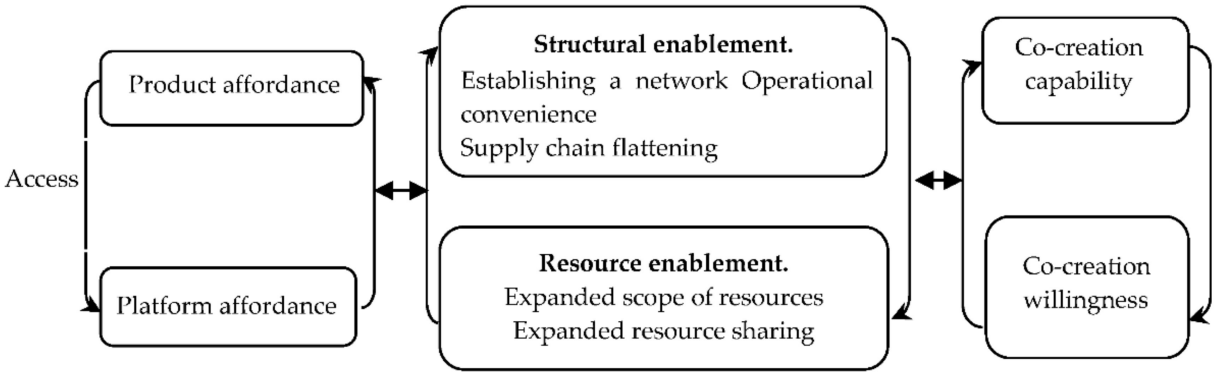

Figure 4. Affordance and IT-enabled interactions enhance willingness and capacity for co-creation.

Finding 3: The interaction of structural enablement and resource enablement based on product affordance and platform affordance drives value co-creation. Product affordance is the prerequisite and method for users to access platform affordance. The interaction of affordance promotes the interaction of structural enablement and resource enablement, which promotes the interactive enhancement of co-creation willingness and co-creation capability.

5.5. Behavioral Evolutionary Path for User Participation in Value Co-Creation

The three major elements of effective value creation activities are as follows: first, to win the trust and establish an emotional connection through customer-oriented experience [57]; second, to create a co-creation context to activate the connection mechanism [58,59]; and third, to form a stable community based on social value [28]. The user value co-creation activities of the studied company are in line with the above three elements, that is, winning users' trust through product affordance and, thereby, triggering users' willingness to participate in value co-creation; building a connection network through platform affordance and creating a co-creation context to initiate the connection mechanism; and establishing a sharing community to expand the influence of social value. These three elements promote and integrate, forming staggering support for users' willingness and abilities to participate in value co-creation. As the product experience is enhanced, users develop trust in the product, gradually build trust in the brand, and develop the willingness to co-create. The platform provides convenience and a communication network for users to participate in value co-creation. In improving users' capabilities, their willingness to participate in value co-creation will also be enhanced, and the willingness and capability for co-creation will influence and promote each other, which will eventually lead to users' participation in value co-creation. Overall, the users' value co-creation behavior is divided into three dimensions: informational/actionable and attitudinal participation, which are hierarchical, and there is also hierarchical interaction between each dimension (Figure 5).

The behavioral changes of users participating in value co-creation follow a gradual evolutionary path from perception to practice, which can be divided into four stages (Figure 6). The first stageis the cognitive experience stage, which, strictly speaking, is a pre-value co-creation participation stage. In this stage, the user is an ordinary consumer, not yet a participant in value co-creation. The user tries or buys the product as a consumer, generates a buying experience and a user experience, and contributes to the economic profit brought by the product's sale for the enterprise. This stage is the prerequisite for users to access the product system and perceive product affordance, and it is also the basis for users to enter the value co-creation stage. The second stage is the informational participation stage. This stage is limited to sharing product usage experience, where users share and give feedback on their feelings and experiences during the product's use. The third stage is actionable and informational participation. In this stage, the users build trust in the

product through the initial perception of product affordance and experience perception in the first stage, form trust in the brand, trigger the willingness to participate as an agent, and start the participation action of value co-creation through actual action. This stage of value co-creation is mainly reflected in the sale of the product by the agent. The user's identity changes from a single consumer to the dual identity of a consumer and entrepreneur. In addition to actionable participation in value co-creation, there are also informational participation behaviors in this stage. On the one hand, users may bring in new customer resources through the sharing of actively promoted products. On the other hand, users expand the brand's influence through agent sales behavior and may bring in new potential value co-creators by sharing entrepreneurial experiences. In the fourth stage, user value co-creation's participation behaviors include informational participation, actionable participation, and attitudinal participation. Informational participation in this stage mainly refers to team collaboration, sharing, and taking the initiative to answer other team members' questions. Actionable participation mainly refers to forming a team, managing the team as a team leader, and leading new team members to participate in value co-creation, in addition to selling the products themselves as senior agents. Attitudinal participation mainly refers to passing on value by sharing after practice and better recognizing the brand and the entrepreneurial model. It also involves acting as instructors for team training and training output and helping newcomers to acquire new ideas or master entrepreneurial skills. In these activities, value co-creation participants form value interactions with each other and achieve collaborative value output through team collaboration. Through the role (WHO)/behavior and activity (WAHT) changes of the participants in these four stages, the business model of the enterprise realizes the innovation of digital transformation. The following are a few examples from the case study.

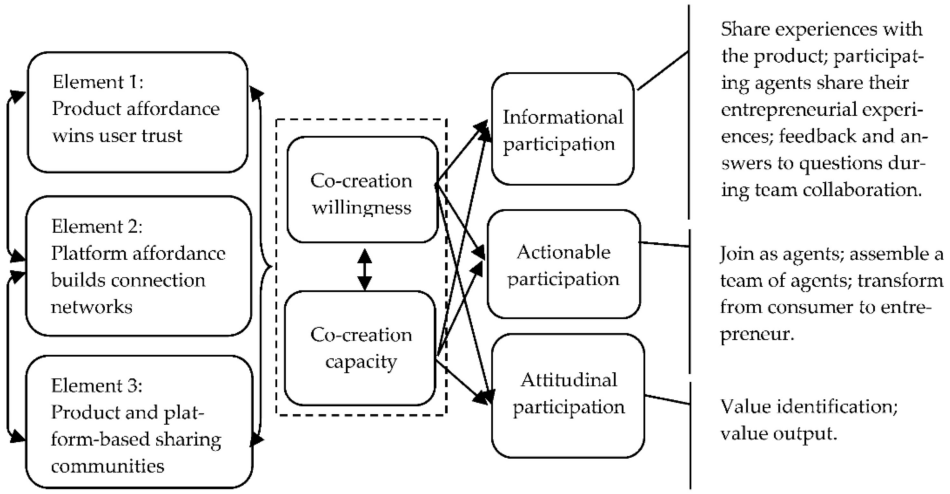

Figure 5. User value co-creation participation behavior.

Community sharing: *"On a daily basis, we share through communities and team groups. The sharing happens daily; someone is on duty to share in the group, mainly sharing product knowledge, product experience, their own entrepreneurial stories, or answering some other agent's problems encountered in the sales process."* (Senior Agent)

Training output: *"I am currently the team leader of a team of 2700 people and will often share my experience to other agents in the team and lead training sessions to share essential skills for newcomers regarding trial set purchase conversion, customer psychological analysis, customer intention management, seeding, communication skills, etc., to help other newcomers grow."* (Team Leader)

Value recognition: *"After I had my second baby, I stayed home full time with my kids and worked part-time as an agent. It didn't disturb my time with kids, and I could*

support myself. I gained confidence in myself and was willing to work hard for it." (General Agent)

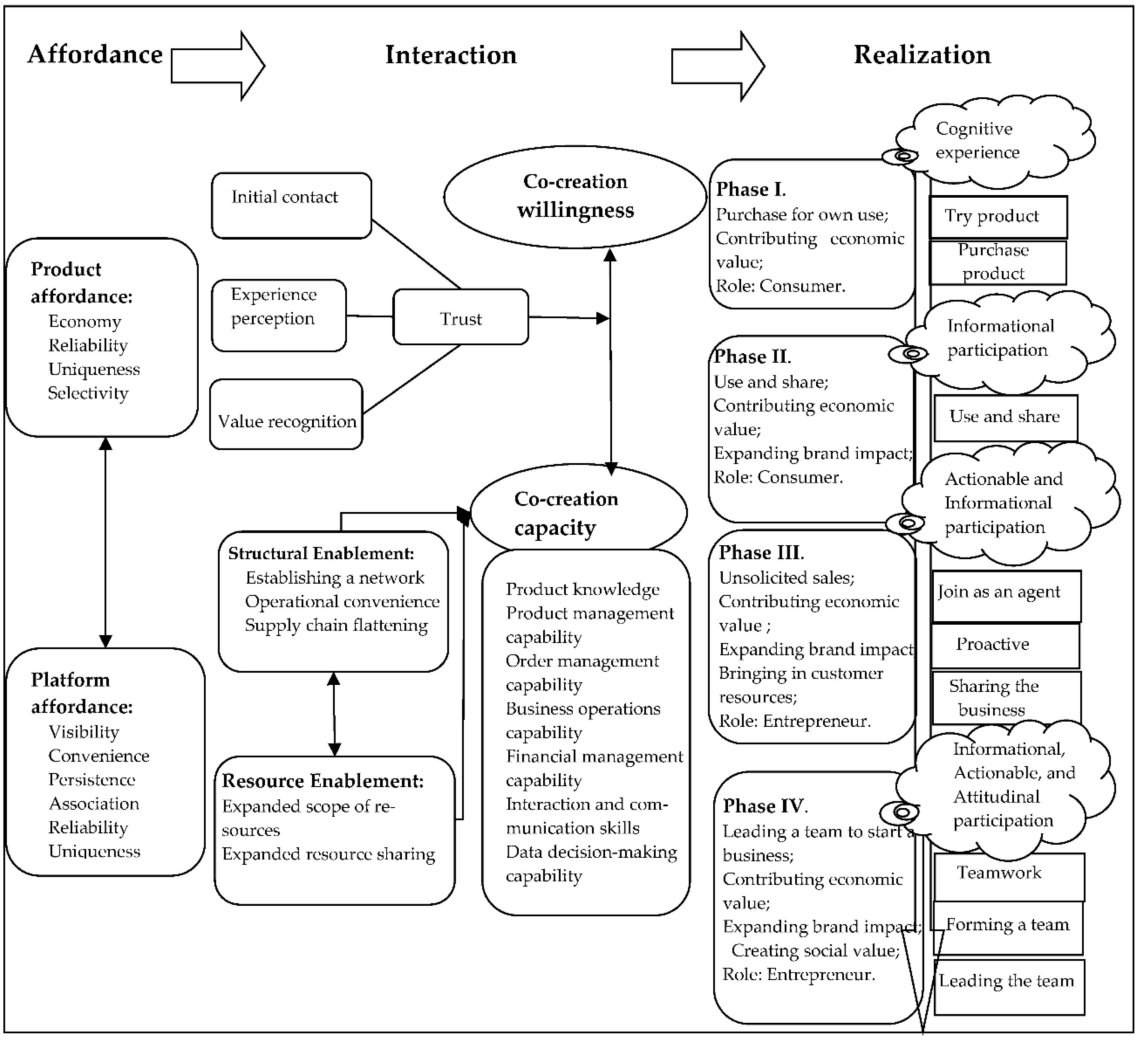

Figure 6. Evolution of value co-creation participation and business model innovation.

Finding 4: Users' participation in value co-creation is divided into three dimensions, namely informational participation, actionable participation, and attitudinal participation; and four stages, namely cognitive experience in the pre-participation stage, informational participation stage, actionable and informational participation stage, and full participation stage (information, actionable, and attitudinal participation). The several stages of value co-creation evolve gradually, as users' trust in the product and platform deepens and their own capabilities improve.

6. Conclusions and Prospects

6.1. Conclusions

This study combined the case study approach and applied the SPS case study logic. Through case data collection, interviews and practical observations, the study found the following: (1) Four characteristics of a product (product economics, reliability, uniqueness, and selectively) trigger the original willingness of customer value co-creation. (2) Four attributes of the platform enhance users' abilities to participate in value co-creation: visibility, convenience, association, and persistence. (3) The interaction of structural enablement and resource enablement based on product affordance and platform affordance drives value co-creation. (4) According to the classification of users' participation behaviors, the

evolution of user participation in value co-creation has four stages: the pre-participation stage, informational participation stage, actionable and informational participation stage, and full participation stage (information, actionable, and attitudinal participation).

Users' participation in the value co-creation process changes identities and roles, that is, from a single identity as an ordinary consumer to a dual identity as a consumer and entrepreneur. These changes, facilitated by the use of information technology, have led to the transformation of business models.

6.2. Theoretical Contributions

Using the affordance theory to explain the internal logic of IT enablement provides a new theoretical perspective for the research in this field. From the viewpoint of affordance, this study uses product affordance and platform affordance to explain how traditional enterprises use IT technology to realize digital enablement in the process of digital transformation and clarify the inner logic and mechanism of digital enablement. This study combines the case study approach with affordance, enablement interaction, and value co-creation to explain how users access products and platforms and the mechanism of enhancing value co-creation willingness and capability through platform enablement. This study also subdivided the three dimensions of users' value co-creation participation behaviors and the four evolutionary stages of value co-creation behaviors, thus enriching the theories of digital enablement and value co-creation. To a certain extent, it answers the realization method of technology empowerment or IT enablement, promoting business model innovation.

6.3. Managerial Implications

The findings reveal managerial implications on how traditional enterprises use IT enablement to promote business model innovation of customer participation in value co-creation and providing fresh insights into the methods, paths, and mechanism of business model innovation through IT, enabling customers to participate in value co-creation. To a certain extent, this paper uncovers the internal secret of digital technology enabling value co-creation and business model innovation and provides a theoretical framework support for traditional enterprises to innovate business models based on value co-creation. In particular, the research on platform affordance, such as the analysis of Cloud Warehouse system characteristics, provides a good example for enterprises that want to implement customer participation in value co-creation.

6.4. Shortcomings and Prospects

The study also has some limitations in that only a sales platform in the maternal and infant products industry was selected as the case study, although the case company is reasonably representative. However, these case materials can only represent a sample of a specific group in a specific industry, and there are inevitable limitations in the research framework and the patterns found. In the future, more industries and representative cases can be focused on and multiple case studies or empirical studies conducted to enrich and revise the framework and findings of this study.

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Appendix A. The Guiding Interview Outline

Appendix A.1. Affordance

How did you first come into contact with Miffy products?

Could you give us a brief introduction of Miffy products? How many product categories, and what features of these products appeal to you? Or what features of Miffy products impress you?

How was your first taste of Miffy? What do you think are the unique features of these products compared to the similar products you use? Or what makes you trust this brand?

Does the company provide a digital operating platform for agents? If there is such a platform, do you think this platform is convenient to use? What functions can the platform provide for you, or what business operations can it help you implement? Do you think it will help you?

Is Your Business or other customer data permanently stored and accessible on the platform? How reliable is the data?

Do you like to use the company's Digital Operating Platform for you? Is it possible to establish contact with other agents of the company through the platform, or is it easier to reach customers or deliver products to end consumers?

When did you first join the agency team? How long has it been? Can you share with us your reasons for joining the agency team? (If the reasons involve product and platform features, you can ask for details and guide the interviewee to rank the importance of the influencing factors)

Appendix A.2. Participation in Value Co-Creation

What made you want to be Miffy's agent? Are you working full-time or part-time?

Could you talk briefly about Miffy's agency mechanism? What are the different levels of agents, and what are the entry requirements? Or what benefits do you enjoy?

How do you sell Miffy and how does it work? How much do you make selling Miffy?

How often do you share your experience of product use or agency sales? Where do you share them and to whom?

You lead the team? How do you attract other customers to join your team? What's different about that?

Do you actively participate in team sharing and share what you have learned with others? What do you feel differently about this?

How often do you help New People on your team? For example, answer their business questions, or give some business training and guidance?

You guys do a lot of sharing like a fan festival, don't you? When it comes to sharing, do you do it on your own, or do you have an assessment? How does participating in the sharing process help you as a person or as a startup?

Which senior agents have had a big impact on you in the past? Name One thing you've been most impressed with.

What motivates agents to make a sustained effort to sell Miffy? Do you have any other entrepreneurial experiences you'd like to share with me?

Do you agree with Miffy's sales model? What kind of value do you think Miffy products convey? Apart from increasing your income, what positive impact do you think the Miffy model has had on your personal life and development?

Were there any memorable difficulties with representing Miffy? Do you have any other personal experiences with Miffy's representation you'd like to share with me?

Appendix A.3. IT Enablement

What do you think of the company's support for the agents? Can you elaborate on that? Which support will be more helpful to the agents?

What resources or support measures does the company have to offer? For example, does the company have a network that agents can use? Or is there a technology platform that is easy to use, and if so, do the companies that use it provide training? Does the company offer any other kind of training? What kind of training?

What resources are available to you through the company's various IT support?

What do you think of the company's Cloud Warehouse system? In what ways has the Cloud Warehouse system helped you the most? Or what business pain point can be solvedvia Cloud Warehouse System? What do you think is the biggest difference between using the cloud storage system and not using the cloud storage system? What are the benefits?

Does the Cloud Warehouse system to provide the function of product sales and Channel Management? Does it work? Is it easy to use?

What do you think has changed since you became an agent? What are the improvements in your abilities? What capability improvement is achieved through the company's technical support? Or what technical support from the company has helped you solve the skills dilemma of participating in an agency venture, leading you to be more willing to participate?

Does COVID-19 Affect Your Business? What does it affect? What kinds of support did the company give during this period, such as technical support, training or other aspects?

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