

Original Paper

A Study on the Business Model Optimization Strategy of Knowledge Payment Platform: The Example of Zhihu

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Abstract

The rapid development of the Internet has contributed to the continued advancement of the knowledge payment industry. Currently, knowledge payment platforms, as the core force of the knowledge payment market, guide the continuous changes in the direction of content production, enterprise operation and consumer demand in the knowledge payment industry. However, research on knowledge payment platforms in academia is still in its infancy, and in particular, there is a paucity of research that systematically examines the characteristics of successful knowledge payment platforms and strategies to address the problems of business models from the perspective of business models as a whole. Therefore, a systematic and thorough understanding of the essence and richness of the business models of knowledge payment platforms is crucial to an in-depth understanding and grasp of the development rules of the knowledge payment industry.

This article focuses on the business models of Internet knowledge payment platforms and their optimisation strategies. Take Zhihu as an example using a case study approach and the perspective of value networks, this paper constructs a business model based on value networks and conducts specific research and analysis on the eight elements of the business model to explore the essence of the business model of knowledge payment platforms and its optimisation strategies under the collaborative competition model, which is equally important in the Internet era.

Evidence from this case study finds that value network is the main form of operation of the business model of platform-based enterprises, and the platform achieves the business closure of value acquisition and value maintenance through the engine driven by value proposition and value co-creation. The study reveals that competition and cooperation are equally important business concepts and the whole process of cross-enterprise value co-creation in the Internet era, which complements the research perspective of business model optimization strategy research focusing on competition and provides certain reference significance for the business model optimization of

platform-based enterprises.

The contribution of this paper is to provide a new perspective for the study of business model optimization strategies. This article is sorting out business model optimization strategies. On the basis of relevant literature, the original theoretical research perspective of enterprise management focusing on competition rather than cooperation is supplemented, From the perspective of “value network”, combined with the theoretical basis of Yuanlei’s business model, a business model based on value network is proposed Model. On this basis, take the knowledge payment industry as the exploration field, and take the typical knowledge payment platform Zhihu platform. In order to study the case, by revealing the key factors for the success of the business model of Zhihu platform, verify the new business model theory Explanations of enterprise practice. Through research, it is found that the theoretical model of the new business model better explains the Internet knowledge. The essence of the business model of the payment platform is a complete value co-creation closed-loop structure, which also reveals the Internet knowledge.

Keywords

knowledge payment, business model, value network, experiential marketing, business model optimization

1. Introduction

More than 40 years of reform and opening up have led to a huge economic improvement in China, and the national economic level has also risen. According to the National Bureau of Statistics 2020 (Figure 1-1), the per capita disposable income of China’s residents rose from RMB23,821 in 2016 to RMB32,189 in 2020, an increase of 74%. The growth in disposable income has stimulated a shift in the direction of residents’ lives, with their consumption gradually shifting from material to spiritual.

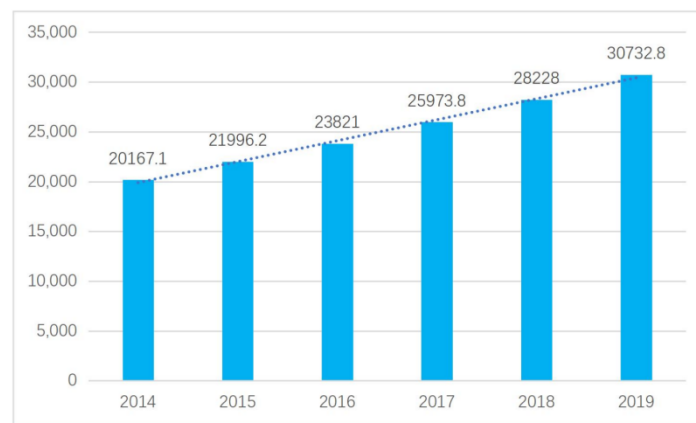


Figure 1-1. Per Capita Disposable Income of the Population

As shown in Figure 1-2, it is clear from the information that by 2019, the structure of China’s residents’ consumption has changed significantly, from an earlier focus on food and clothing to a gradual shift in

consumption of entertainment, leisure, and cultural communications. Behind the change in the structure of consumption is an upgrade in the concept of consumption and consumer demand. According to Almeida, by 2020, the consumption of paid knowledge products will be popular among young people in the new era (Guo, 2020).

1 Data collated from Table 6-1 of China Statistical Yearbook 2020

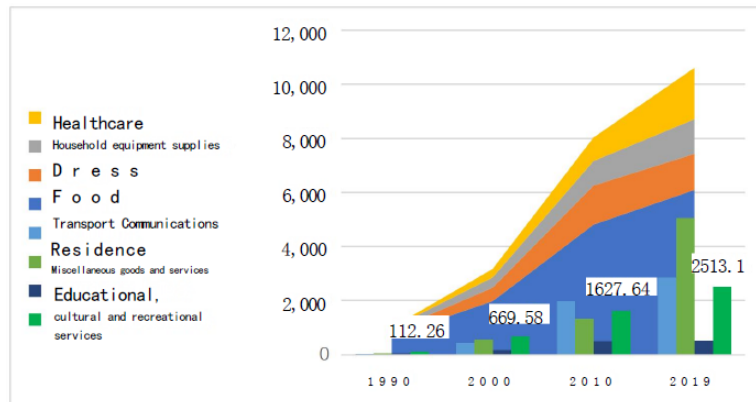


Figure 1-2. Changes in Consumption Structure of Urban Residents in China

At the same time, the popularity and rapid development of the Internet and the popularisation of mobile devices have prompted mobile phone terminals and smart watches to become an integral part of modern people’s daily lives. People are becoming accustomed to using their mobile phones to make calls, listen to music, order takeaways, and other operations as a way to meet their daily needs. According to information, “As of December 2020, the average length of Internet users in China was over 26.2 hours, the number of Internet users in China reached 989 million, and the penetration rate of Internet users was 70.04%. The number of mobile phone Internet users in China is 986 million, and the number of mobile phone users accounts for 99.7% of the total number of Internet users” (as shown in Figure 1-4).

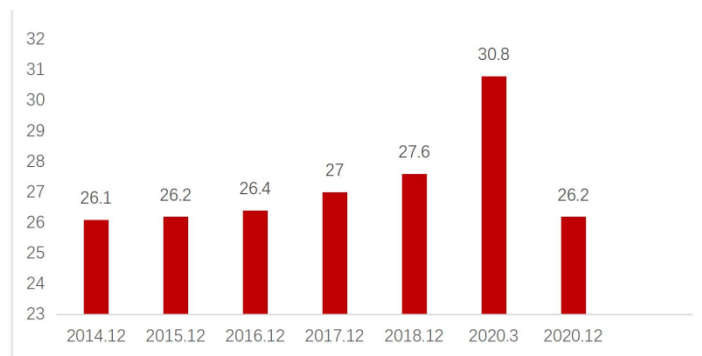


Figure 1-3. Average Internet Time by 2020

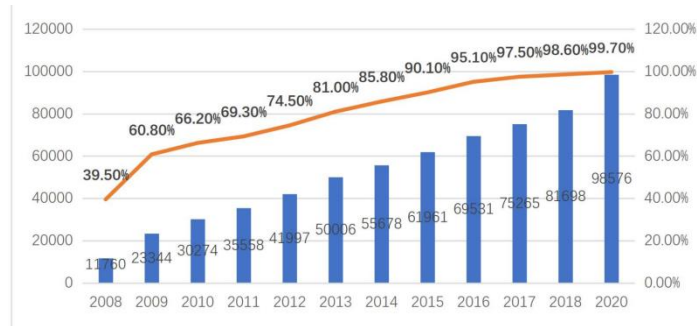


Figure 1-4. The Scale and Proportion of Internet Users

The process of paying for knowledge has been accelerated again with the advent of payment software. In the three years since 2014, the number of people paying online has grown by 300 million, at a compound annual growth rate of 18.5% (Figures 1-5) (Guo, 2020).

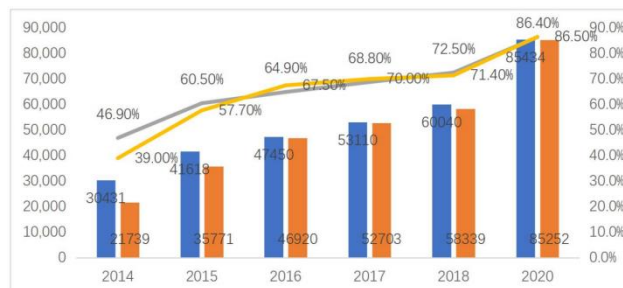


Figure 1-5. The Proportion of Online Payment and Mobile Payment in China (2014-2018)

In the early days, the internet economy was based on free news or free information. With the gradual development of the economy, free information exploded and the number of related information of the same type increased day by day, but the quality of the information was in the mud, the public spent more and more time finding effective information, but received less and less effective information. As the public's demand for effective information grows, knowledge payment platforms have emerged. Gradually, the free platforms that were initially funded by capital began to be abandoned by capital and went out of business. The capital that abandoned the free platforms gradually switched to the paid platforms, thus opening a new phase of the knowledge payment market, namely the midfield model phase with free as an attraction and paid as an upgrade service. 2020 saw the economic downturn brought about by the new crown epidemic, which intensified the mental pressure on social workers on the risk of job loss in the workplace. The masses have turned their attention to knowledge payment in order to relieve the pressure. According to Ai Media Agency, more than half of the cumulative knowledge payment users, during the epidemic, purchased courses on workplace and education-related content.

Due to the changing environment in China, this study has several motivations.

First, provide a new research perspective to explore the new features of the business model of the

Internet platform. The traditional “competition” business concept of enterprises based on competition over cooperation, which uses PEST analysis theory, Porter’s five forces model theory, SWOT analysis theory and value chain theory, is not theoretical enough for the development law of new business models of enterprises that emphasize collaborative competition on the Internet platform. It is necessary to introduce a new perspective of “value network” to supplement the theoretical model of business models, so as to reveal the new characteristics of cross-enterprise value co-creation of business models on the Internet platform.

Second, through a comprehensive and systematic theoretical model of the new business model, analyze the actual operation mechanism and key elements of the success of the Internet knowledge payment platform, and summarize the connotation of the new business model of the knowledge payment platform. After introducing the new perspective of “value network”, whether the new business model can well explain enterprise practice needs to be tested with a typical enterprise case platform. At the same time, through the in-depth analysis of the core elements of the case platform through the new business model theory, we can also capture the operating mechanism of the case platform and find the platform to succeed

Finally, summarize the essence of the new business model of the knowledge payment platform. Third, discuss the existing problems and solutions of the new business model. With the development of the business model of the Internet platform, there are also some problems. What are these problems and how to solve them. This paper will start from the new business model theory, analyze and summarize the current problems of the business model, and propose targeted solutions.

2. Literature Review

2.1 Research Related to Knowledge Payment

The knowledge payment literature is in its infancy. Stephen (2009) suggests that paying for knowledge is a term that is easy to understand but difficult to define. In its literal sense, it represents an act of purchase or a buying phenomenon, which can be extended to an economic phenomenon. However, in terms of the source of knowledge, it involves a number of other areas, such as educational publishing, production and communication, and social messaging. Therefore, in order to understand the meaning of payment for knowledge in depth, it is necessary to go deeper into the essential properties of payment for knowledge. The essence of knowledge payment is that one bears the corresponding cost for specific access to information . From this perspective, knowledge payment consists of two elements, namely “knowledge” and “payment”. In terms of “knowledge” itself, it is defined as valuable information, i.e. knowledge is not the same as information. Secondly, the term “payment” itself is a modification and qualification of “knowledge” (Xie & Wei, 2019), i.e., the very act of “payment” implies that “knowledge “This suggests that “knowledge” should have two obvious characteristics: 1. seriousness or scientific nature, i.e. it must be judged by professional knowledge, etc.; 2. originality, i.e. it requires the knowledge provider to effectively process and refine the information into valuable knowledge.

Therefore, the meaning of paying for knowledge should be a transactional act that enables the exchange of value in the form of a commodity (Rochet & Tirole, 2004).

However, at the level of sharing, knowledge payment connotes an economic interaction that exchanges resources for personal experience and technology. Therefore, the author tentatively understands knowledge payment as a transactional act between the user's purpose of acquiring knowledge and online knowledge services as suggested by Armstrong and Wright (2007). The reason why it is limited to online knowledge services is that earliest scholars who studied the concept of knowledge payment in China, first proposed the concept of "knowledge payment" with the Internet sharing economy as the research object. This means that the earliest connotation of knowledge payment refers to online knowledge services, and the scope and types of other knowledge services involved can be attributed to the extension of knowledge payment (Kaiser et al., 2006; Baxter et al., 1983).

It is important to note that there are many terms related to knowledge payment, such as content payment and knowledge sharing, and it is often easy to confuse these three concepts when talking about knowledge payment. Overall, there is a cross-relationship between these three concepts. Knowledge payment includes both content payment and knowledge sharing in terms of cost. Paying for knowledge can be divided into free-to-share and pay-to-sell. Knowledge sharing, which can be seen as a type of freemium, can also be seen as a marketing tool for knowledge payments, whereby people who want to access certain free knowledge need to complete a "knowledge sharing" task required by the knowledge provider in order to receive the corresponding free knowledge. Content payment is not so much related to knowledge sharing, as content payment is a major type of knowledge payment, while other types of knowledge payment include a subscription to periodicals, stock information, etc. (Rochet et al., 2003; Kaiser et al., 2006).

In addition, three concepts need to be understood: knowledge payment, internet knowledge payment platforms, and internet platforms. Internet knowledge payment platforms include Internet platforms and knowledge payment transactions. Internet platforms are the infrastructure for knowledge payment transactions and the operational space for them to carry out transactional acts (Kind & Nilssen, 2005). Knowledge payment transactions are the operational mechanism of the Internet knowledge payment platform.

2.2 Research Related to Value Networks

The disruption of Internet technology, the ever-changing needs of customers and the fierce competition for market share have caused the boundary range of enterprises to be constantly broken. In order to gain a better competitive advantage, enterprises start to shift their value creation from the traditional reliance on internal resources to more reliance on inter-enterprise advantageous cooperation (Katz et al., 1985; Farrell et al., 1985). The new value creation logic enables companies to create innovations, integrate internal and external resources in a cross-company manner and adapt quickly to new market changes within the company. As enterprises complete the new changes, along with the influence of the international and domestic network economic environment, the traditional organisational form of

enterprise value chain performance gradually shifts from the original vertical integration to an organisational form that separates superior resources from inferior resources, and eventually evolves into a network-like organisational form that interacts with each other and changes constantly (Conner, 1995). Taken together, the literature asserts that knowledge platforms are becoming increasingly important to the general public. Some innovations associated with knowledge platforms are described by issues 1-2 below.

(1) Enterprise value creation under value networks.

One of the more famous critiques of traditional value chains is Brandenburger et al., in their in-depth critique of enterprise value chains, concluded that competition and cooperation among enterprises are important elements essential for enterprises to gain profits (Baake & Boom, 2001). If firms focus too much on competition, they will lose more opportunities. Conversely, if firms focus too much on cooperation, they will be easily overtaken or subverted by their competitors. Therefore, on the premise of combining the two-way factors of competition and cooperation, they proposed a value network model to reveal the more important complementary relationship between enterprises. The value network differs from the value chain in several significant ways (Rochet et al., 2004; Armstrong et al., 2006): ① the value network focuses more on the customer, shifting the customer's position to the centre of the entire enterprise's value creation. ② Value networks reveal the value-added effects of networks. ③ Value networks focus more on cooperation between enterprises, placing competition and cooperation in the same strategic position, thus circumventing the prisoner's dilemma of traditional value chains.

(2) A comparative study of value chains and value networks.

Some scholars argue that there is an inherent necessity for value chain theory to be challenged by value network theory as a principle of enterprise value creation (Parker et al., 2002; Belleflamme et al., 2009; Xu et al., 2006). Some scholars argue that, compared to value networks, the limitations of the value chain idea are reflected in its unidirectional nature, static nature and lack of innovation, while the value network idea reflects various characteristics such as interaction, evolution and expansion (Rédies et al., 2009; Mäkinen et al., 2007; Rappa et al., 2004). The specific differences between the two are as follows:

(1) Value chains are based on linear thinking of unilinear value creation, while value networks place more emphasis on multi-directional, parallel and interactive value creation.

(2) Value chains pursue relatively static value relationships with upstream and downstream partners (Dubosson-Torbay, Osterwalde, & Pigneur, 2002), while value networks place more emphasis on dynamic adaptability. From the perspective of value division of labour, some scholars view the enterprise value network as a large collection of division of labour, highlighting the dynamic balance and combination of value networks (Zott, Amit, & Donlevy, 2000). Some scholars focus on emphasising the role of the enterprise environment in influencing enterprise value creation, arguing that enterprise value creation should not only emphasise changes in enterprise productivity, ignoring the

environmental losses behind high production efficiency (Magretta, 2002).

To sum up, the research on the business model of the knowledge payment platform mainly focuses on case analysis and type summary, followed by a specific element of the business model, such as profit and operation development, which is not systematic enough; At the same time, when studying the business model of the knowledge payment platform, it is always based on the premise of the stable boundary of the enterprise, rather than the characteristics of the Internet platform breaking through the enterprise boundary. In addition, the research on the optimization strategy of business model focuses more on the theoretical research perspective of competition than cooperation, and ignores the value co-creation process that competition and cooperation are equally important in the new market environment of the Internet. Therefore, based on the research results of the “3-4-8” business model, this paper constructs a business model theory based on the new perspective of the value network to conduct systematic business model research, trying to capture the operating mechanism and success factors of the business model of the Internet platform, and summarize the essence of the new business model of the Internet platform, in order to provide new research ideas for the optimization strategy of the business model.

3. Research Methodology and Research Process

3.1 Analytical Method Combining Qualitative and Quantitative Analysis

With regard to the research topic of the business model of China’s online knowledge payment platform, the research idea of this paper is theoretical construction and case description, and based on the theory to analyze the industry development problems and propose corresponding solutions to the industry development problems. In the specific research process, a combination of quantitative and qualitative analysis is mainly used.

The theoretical foundation of the research is based on qualitative analysis. Based on a large amount of theoretical materials on knowledge payment, value networks and business models, this paper composes the research paths of knowledge payment and business models, and constructs a new theoretical model of the business model of knowledge payment.

A new theoretical model of knowledge payment business model is constructed. A quantitative approach is adopted to analyse the platform model, and data is collected through questionnaires and in-depth interviews.

Using a combination of quantitative and qualitative analysis, the research method can be used to visually analyse the problem through data, questionnaires and find the crux of the problem, thus laying the foundation for the subsequent qualitative analysis.

3.2 Research Process

With regard to the commercial mode and optimization strategies of knowledge payment platforms, based on the summary of previous literature, this paper finds that the traditional research on commercial mode optimization strategies has mostly focused on the theoretical research perspective

under the business operation view of competition over cooperation, including the classical Porter's five forces model, PEST analysis model and value chain model.

Therefore, the theoretical model of the commercial mode of the Internet platform based on value networks is constructed by combining the new model of collaborative competition and the new characteristics of cross-enterprise value co-creation on the Internet platform, which sets the analytical framework of the commercial mode in this paper.

Secondly, focusing on the enterprise practice of Zhihu platform, the eight elements of the new commercial mode framework are used to analyze the operation mechanism of the new commercial mode of the knowledge payment platform one by one, laying a theoretical foundation for the subsequent analysis of the new business model. Again, through the study of the operating mechanism of Zhihu platform, the theoretical explanation of the new framework is verified by combining the operating situation of the platform in the market and the financial data of the listed operation. Finally, through the inductive analysis of the theoretical framework and the mutual verification of the market user feedback data, the essence of the new business model of Zhihu platform and its key success factors are summarised, providing certain reference significance for the development of other platforms in the industry. At the same time, it summarises the problems and reasons behind the development of the new knowledge payment business model with the help of user satisfaction survey data from authoritative research institutions, locates the indicators for optimising the business model based on the "eight elements" of the business model, and proposes strategies for optimising the business model.

3.3 Data Collection

This paper collects data by reviewing classic books and related literature on knowledge payment, and collating reports on knowledge payment from major media, in order to understand as accurately as possible the current situation and trends of the industry's development, so as to explore in depth the solutions to the problems of the business model of knowledge payment platforms. In the process of collecting information on knowledge payment, I found that the business model of Zhihu platform, as one of the larger payment platforms in China, is a mature one. The object of the author's research is the business model optimisation strategy, and there is a stronger correlation between the results of the enterprises' practice in the market and the recognition of the capital market and the business model than the interview records.

Table 3-1. Data Source Details

Period	Source
Data collection and collation	Collection of literature and professional books
	Major media outlets involved in paid knowledge coverage
	Research reports from business consultancies
	Knowing financial reports, business plans, etc.

Zhihu Listing Report, etc.

Additional data and collation

Zhihu APP operation data, user satisfaction survey, etc.

4. Analysis of the Business Model of the Zhihu Platform

4.1 Value Positioning of the Zhihu Platform

After comparing various similar business platforms at home and abroad, Zhihu chose to position itself as an “interest-based community” (Zott & Amit, 2010). However, even though the new value proposition has been established, it only represents a new beginning for the platform’s development, and the founders still need to continue to think and explore. Interest-based communities were very competitive in China at the time, with some of the most popular ones being forums, blogs, posting bars and so on. These interest communities had high overlap with each other, weak platform differentiation, and the platforms themselves did not have the operational capabilities that their rivals could not replicate, resulting in extremely low user transfer costs and low loyalty to the platforms (Mahadevan, 2000). These interest platforms have all encountered bottlenecks in their development after a period of time in the direction of interest communities: user activity has declined, customer acquisition costs have climbed, platform profits have declined, and the more serious ones are almost on the verge of closure. Therefore, Zhihu should not stop, but also consider the reasons behind the development difficulties of these interest communities and explore ways to break through. In the process of exploration, Zhihu has taken the lead in launching “Answers”, “Zhihu Live” and “Private Lessons”, which are based on the interaction of text and pictures, as well as voice, real-time online, and topic-based services. This was a breakthrough in the development of online interest communities and the beginning of Zhihu’s value proposition as a “knowledge question and answer platform”

4.2 The Value Aspirations of the Zhihu Platform

The value aspiration of the Zhihu platform is a process of deepening, starting with the satisfaction of knowledge seeking, the middle stage is systematic self-improvement, and the final stage is the pursuit of “surpassing the traditional elite”.

Discovering a better world. Satisfying the need for knowledge is the goal of Zhihu’s positioning as a high-quality Q&A community (Thomas, 2001).

Self-improvement. the space for survival is getting smaller and smaller, while the pressure to survive is getting bigger and bigger. Behind the shrinking space for survival is the increasing demand for knowledge at the individual level, which has led to an increasing willingness to improve oneself (Morgan, 2020).

The pursuit of value beyond the traditional elite. It should be said that what sets Zhihu apart from other knowledge and Q&A communities such as Baidu Post and Qibao, and gives it a competitive advantage, is the continued introduction of elites from various industries in the early days of Zhihu.

4.3 Zhihu's Core Competence—A Channel for Elite and Popular Discourse

while connecting the elite class with the general public, on the one hand compensates for the lack of power of the elite class in the era of new media and self-media after their discourse power has been seized, and completes the value satisfaction and value creation of knowledge creators, and on the other hand satisfies the construction of the discourse power system of the general public through the interactive dialogue between the public and the elite and the desire to “surpass the On the other hand, through the interactive dialogue between the public and the elite, it satisfies the psychological motivation of the general public to build a discourse system and the desire to “surpass the traditional elite” (Weill et al., 2001; Sosna et al., 2010).

4.4 Key Business Activities of the Zhihu Platform—A Diverse Product System

Zhihu's product system is the business activity that realises the value of its business model. It directly determines what the final output of the platform is and how users can access the value of the platform through the products. This section focuses on the four main products that contribute to Zhihu's profits: Zhihu Live, Zhihu, Zhihu Bookstore and Zhihu (Lindgardt, 2012).

(1) Zhihu Live, a voice-based Q&A product, is one of Zhihu's main paid knowledge products. The largest systematic course in the entire Zhihu Live system is the private lesson. Private lessons not only meet users' need for systematic knowledge, but also provide them with content products that are selected through a selection process. The feature was well received by the market as soon as it was launched. According to information, from 2016 to 2017, Zhihu Live held close to 7,000 sessions, involving more than 700 speakers, and the income of a single Live speaker could reach up to RMB 190,000 (Gambardella & McGahan, 2010).



Figure 4-1. Knowledge Zhihu Live Interface

(2) Value. ValueHu is a product launched in 2016 on the Zhihu platform. The product covers more than 20 categories such as law, medicine and psychology, and is driven by the platform's core business of

high quality answerers.

(3) Zhihu Bookstore. The Zhihu Bookstore was launched in 2016 and targets a niche market that the platform has gathered with its own e-book resources. The content of the e-books comes from the platform's core sections of quality Q&A and feature articles, such as "Zhihu One Hour", "Zhihu Salt Series" and "Zhihu Weekly" (Johnson, 2008).

Table 4-2. A List of Electronic Books Published by Zhihu Platform

Brands	Positioning	Go-live time	Frequency of publication	Word count/book	Pricing/book
Knowing Salt	High-end eBooks	2014.4	3-5 books/month	20000-80,000	0.99 - 14.99R
Knowing an hour	In-depth short time Series of eBooks	2015.12	5 books/month	20000	0.99-3.99R
Know Weekly plus	Lightweight eBooks	2016.1	1-4 issues/month	30000-60000	1.99-5.99R

(4) Zhihu e-commerce. The Zhihu platform is built through a multi-channel approach to build its core competencies in e-commerce.

The core value of Zhihu's bookstore comes from the collective discussion between the platform's questioners and countless excellent answerers, and the core value of Zhihu's e-commerce relies not only on the product review process by the authors of the articles, but also on the value evaluation behaviour of the platform's users who participate in the discussions and likes (Ku, 2014). In other words, the value creation process of Zhihu's four major products comes from the cooperation between knowledge consumers, knowledge producers, platform technology and platform support.

4.5 Partner Networks & Partners of the Knowledge Platform

Partner networks and partners of knowledge payment platforms generally have similar components to the platform. Similar components refer to the parts of the knowledge payment platform that interact with external parties in the process of value co-creation, such as knowledge production and consumption. The different components of these similar platforms are the parts of the platform that produce content, including the platform's content production mechanisms and the platform's content management mechanisms. Platforms have different networks and partners at different times of development. In the early development of Zhihu, the platform's partner network and partners were mainly registered users, who were the producers and consumers of the platform's knowledge (Chen, & Yung, 2004; Osterwalder & Pigneur, 2002). When the platform developed into a "community of interest", the platform's partner network and partners added to the original social network and interest network of users. When the platform developed into a "knowledge sharing platform", the platform's

partner network and partners added a variety of roles, including expertise producers and participants in offline brick-and-mortar shops.

As the platform matured, the partner network became more complex and multi-dimensional than in the early days. However, the core partnership network still consists of five components: knowledge consumers, knowledge producers, platform supporters, platform providers and platform complementaries (Berger et al., 2007). The knowledge producers in the platform's maturity stage incorporate a corporate professional team, such as professional publishing houses and research institutes. The supporters of the platform in the mature stage also incorporate independent copyright departments, marketing departments and maintenance departments based on offline product systems. At the same time, the roles of the network of partners in the maturing phase of the platform have become more diverse and three-dimensional. The producers of the platform often produce knowledge and then re-engage in the marketing of their products, using the producers' own fan base to promote their products (Rappa, 2001).

4.6 Zhihu's Customer Relationship Model-Community Operation

The core of content production on the Zhihu platform relies on user-generated content, i.e., UGC, which has the greatest benefits of being highly rendered, highly contagious and acceptable. This is one of the reasons why knowledge communities, such as Post, Ask, Weibo and others, have grown so quickly (Punj, 2015).

However, relying on a single question and answer format alone does not provide a satisfactory answer to the questioner, because knowledge itself is ambiguous and difficult to capture. In response to this problem, Zhihu has adopted two approaches: firstly, it helps content producers to form communities, by gathering interested and relevant users or inviting other speakers to work on a particular topic. The second is to form communities across platforms (Stewart and Zhao, 2000). By collaborating with other social media platforms, such as WeChat and short-form video platforms, Zhihu is able to further capture users' time, deepen their memory of the platform, build multi-dimensional connections, and increase their viscosity and loyalty to the platform.

4.7 The profitability of Zhihu's Platform-Creating a Closed Loop of Value Conversion

Zhihu's profitability system is a multi-dimensional and complex structure, the core of which can be simply abstracted as the co-existence of free and paid business forms. This form is the most mainstream way of operation for Internet knowledge payment platforms, which has the advantage of relying on free registration and functional use to quickly attract and gather large volumes of user traffic. On the other hand, by accurately segmenting the registered user base, it can filter out those who have the ability and demand to pay, and recommend and sell the corresponding course products or services.

Invisible advertising profit. It should be said that the core of the Internet free economic model is never really free, it is the invisible payment. The so-called invisible payment refers to the profitability of advertising on the Internet. For any Internet knowledge platform, or even any information platform, the amount of user browsing, user clicks, and even user dwell time and other data are all critical data for

advertising for accurate marketing to users (Rappa, 2000). Therefore, in today's Internet information era, all messages are media, and all messages are advertising. For the Zhihu platform, advertising is its biggest source of profit.

Profit from paid knowledge products. For users of the Zhihu platform, Zhihu offers a systematic system of paid knowledge products

For users of the platform, Zhihu offers a systematic system of paid knowledge products and courses, including five core products such as Zhihu Live, an e-bookstore and an e-commerce product. The profitability of these products depends on two types of users: short-term direct transactional users, who pay a one-off fee, and long-term potential users, who provide ongoing long-tail benefits.

Offline physical product distribution. The Zhihu platform's "Zhihu Elective Series" should be considered an attempt by Zhihu to build a stable knowledge ecosystem by linking the two methods of physical knowledge payment and online knowledge payment. It is an attempt to build a stable knowledge ecosystem by linking the two ways of paying for knowledge, online and offline (Barton & Court, 2012). It is a sustainable business ecological model in which users are connected online and socialized offline, and eventually online feeds offline and online feeds offline.

Zhihu's e-commerce products. Zhihu is building its e-commerce platform with the help of other platforms, including WeChat, Taobao and Jingdong (Hamel & Trudel, 2001). The reason for using other platforms is twofold: on the one hand, it reduces non-essential costs, such as platform construction and operation costs, to gain some cost advantages. On the other hand, the strategic role of Zhihu as a "buyer" is realized. The essence of the "buyer" role is to try to play the most central marketing channel in the product system. It can be said that Zhihu is more concerned with accurate marketing and attracting traffic than becoming a huge platform for sellers.

The diversified product system constitutes a diverse platform profit model (Morris, Shirokova, & Shatalov, 2013). 2021 Zhihu's prospectus for its IPO shows that its revenue will rise from RMB 670 million to RMB 1.352 billion from 2019 to 2020, an increase of 263.64% year-on-year, with advertising revenue of RMB 843 million and paid membership revenue of RMB 320 million (as shown in Figure 4-2), with advertising accounting for 62.35% of total revenue and paid membership revenue accounting for 23.67% of total revenue. Advertising accounted for 62.35% of total revenue and paid membership revenue accounted for 23.67% of total revenue (as shown in Figure 4-3).

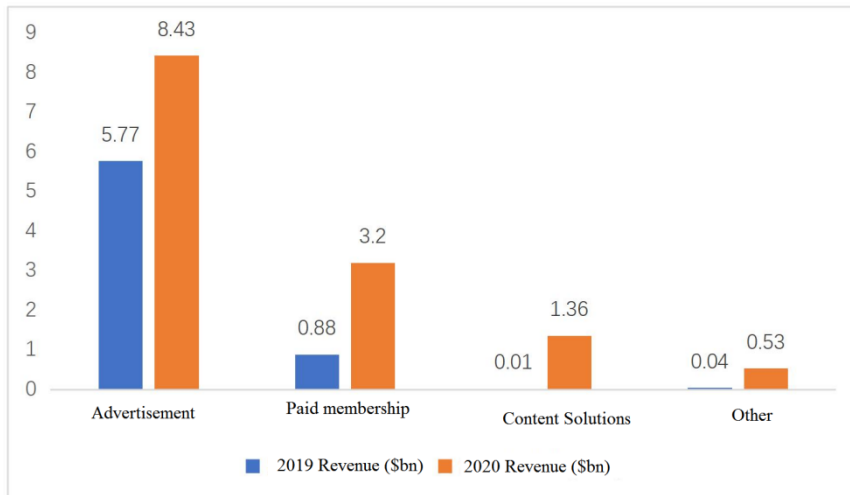


Figure 4-2. Business Revenues for 2019 and 2020

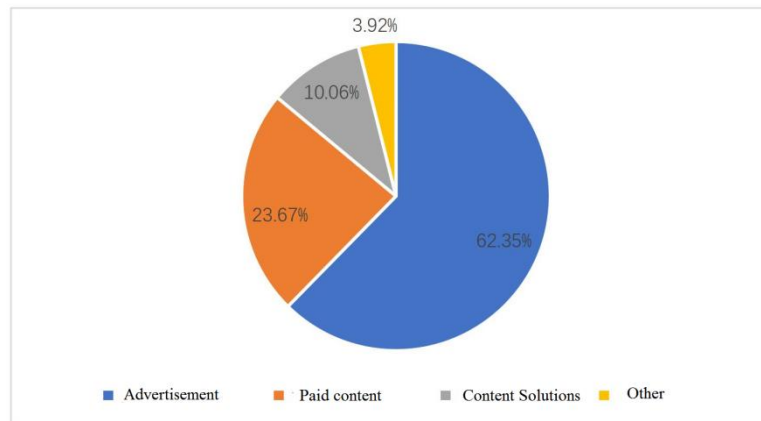


Figure 4-3. The Business Income Structure of Zhihu in 2019 and 2020

The regular costs of a knowledge payment platform include two main types: the research and development costs of the platform's products and technologies, and the operational costs of the platform's daily maintenance. The former is the direct cost of the platform, while the latter is the indirect cost of the platform. However, whether it is direct costs or indirect costs, the core of cost control of the platform is to minimise the rise in costs and increase the profitability of the enterprise (Magretta, 2002). However, for different periods of platform development, the corresponding cost control focus is different. In the early stage of platform development, the focus of cost control is to reduce operating costs and increase the number of users, and the approach taken is often to use other platforms to test the waters at the initial stage, for example, getting started with WeChat public number in the early stage. In the middle of the platform's development, when the number of platform users reaches a certain number, cost control is adopted to add new products and increase the sales volume of products, so as to increase the profit of products and level the production and operation costs of products. This is basically the cost control of Zhihu platform (Amit & Zott, 2001).

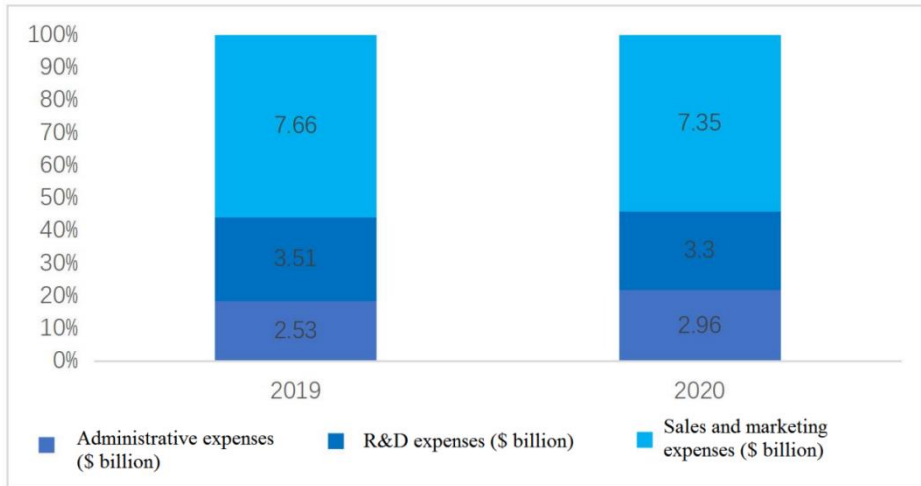


Figure 4-4. 2019-2020 Know-How Management Costs, R & D Costs and Marketing Costs

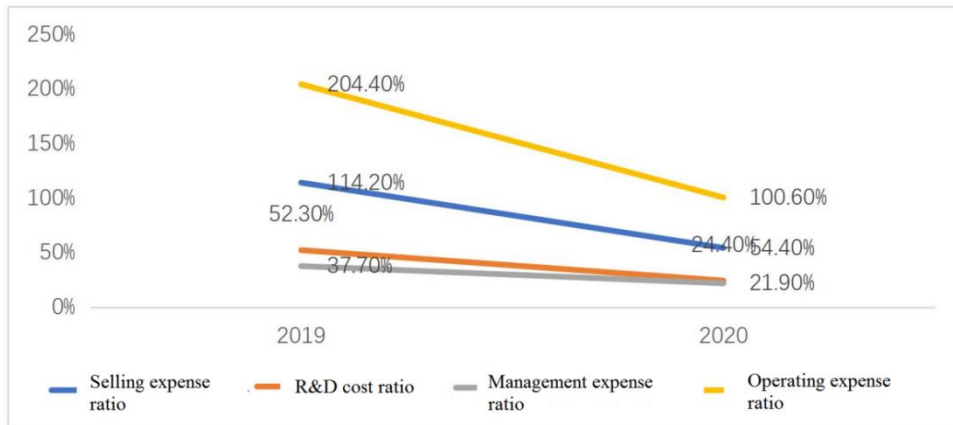


Figure 4-5. Selling, Management, R & D and Operating Rates, 2019-2020

According to Zhihu’s prospectus (as shown in Figure 4-4 and Figure 4-5), Zhihu’s R&D expenses and operating expense ratio decrease overall from 2019 to 2020, with R&D expenses decreasing from \$350 million to \$330 million and operating expense ratio decreasing from 204.4% to 100.6%.

In summary, the Zhihu platform’s business model is a multilateral transaction structure that focuses on a value proposition and satisfies value claims. The entire platform realises the value proposition at different stages, and by satisfying the value demands behind the value proposition at different stages, it reconstructs and integrates its own core competencies and key business capabilities, builds a community culture and cooperation network structure for users in multiple scenarios, and ultimately achieves a win-win situation between the company itself and its partners and other stakeholder groups. Therefore, it is easy to see that in the process of value co-creation, the knowledge payment platform, which breaks through the boundary of the enterprise itself, has taken on more roles and integrated more relevant interests (Chesbrough & Rosenbloom, 2002). Each of these actors plays their own dynamic role in the value co-creation process of knowledge payment platforms: platform providers maintain

platform stability and platform rule enforcement, while knowledge producers and knowledge consumers never stop producing and consuming knowledge on various topics. At the same time, platforms and their complementary parties, such as advertisers and e-commerce companies, exchange their commercial interests in the production and consumption of knowledge. In summary, the above analysis shows that the essence of the knowledge payment platform business model is a closed-loop business process with value proposition as the core, value co-creation and value maintenance as the means, and value acquisition as the purpose, and in the process of value co-creation, a balanced state of win-win value for customers, partners and enterprises is achieved (Siggelkow, 2002). The core of this is the products and services of the platform, which is basically the same as the underlying business logic of traditional knowledge payment.

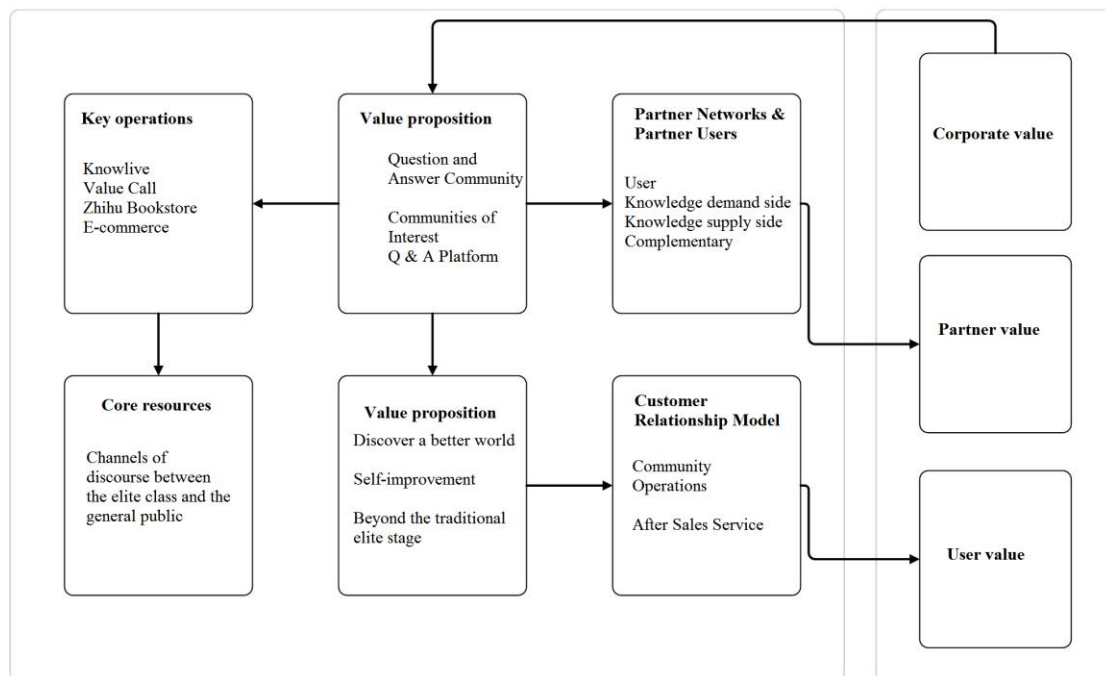


Figure 4-6. Business Model Operating Mechanism Diagram of Knowledge Payment Platform

From this, it is easy to see that the new technology of internet platforms has only changed the transaction form and business ecology of knowledge payment, i.e. from the traditional over-reliance on marketing channels to becoming part of the channels themselves or the channels themselves, but the value product of the underlying logic of knowledge payment is still products and services (Johnson,2008), i.e. the products and services of knowledge payment platforms are the key to determining the business model of knowledge payment platforms. The products and services of knowledge payment platforms are the key to the success of the business model of knowledge payment platforms. Based on the analysis of Zhihu, this paper draws up the operation mechanism of the knowledge payment platform business model as shown in Figure 4-6.

5. Analysis of the Current Problems and Reasons for the Business Model of Zhihu Platform

From the research in the previous chapter, we know that the essence of the value network-based business model is a complete closed-loop process around value co-creation. At the same time, the value network system of a knowledge payment platform integrates the interests of five subjects such as the creators of knowledge, consumers and platform providers (Mahadevan, 2004). In addition, the key success factor of the business model is the platform's products and services, which determine the core value of the platform's business model.

However, along with the development of knowledge payment platforms, many problems have emerged in the platform business model and a bottleneck has been encountered in its development. In the process of observing and analysing the platform business model issues, we found that these business model issues always revolve around the core part of the platform, namely the platform's products and services. In this chapter, we describe and analyse the current problems with the business model of knowledge payment platforms, drawing on literature and data from companies and authoritative research organisations.

5.1 *Quality Problems with Product Content*

Currently, the problems with the business model of the Zhihu platform are mainly related to the platform's product services, where the product problems are mainly reflected in the pan-entertainment, fragmentation, homogenisation and infringement of content (Venkatraman & Henderson, 2008). The reasons for the problems with the product content can be broadly explained in two ways: on the one hand, there is the problem of the platform mechanism, and on the other hand, there is the problem of the content producers. The limitations of the content producers and their lack of quantity lead to the lack of quantity of content produced and the quality of content cannot be guaranteed. The lack of quality assurance mechanism of the platform leads to the further deterioration of the platform content, which eventually causes the degradation or even destruction of the professional brand image of the platform, the logic of which is shown in Figure 5-1.

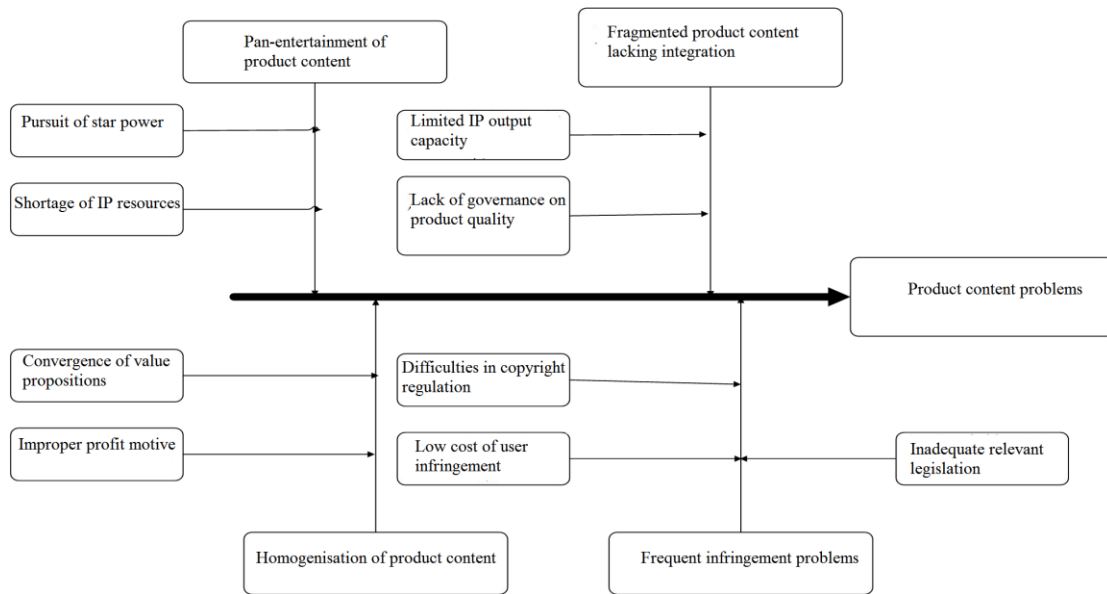


Figure 5-1. Quality Problems of Product Content

According to the survey report on the feedback of paid knowledge users on paid knowledge platforms, nearly 50 percent of paid users believe that the existing paid knowledge industry generally suffers from a lack of professional knowledge and practicality. In addition, more than 50 percent of paid users believe that the recommended services of paid platforms are overloaded with advertisements and invalid information, and that recommendations based on users’ own needs are extremely lacking, as shown in Figure 5-2.

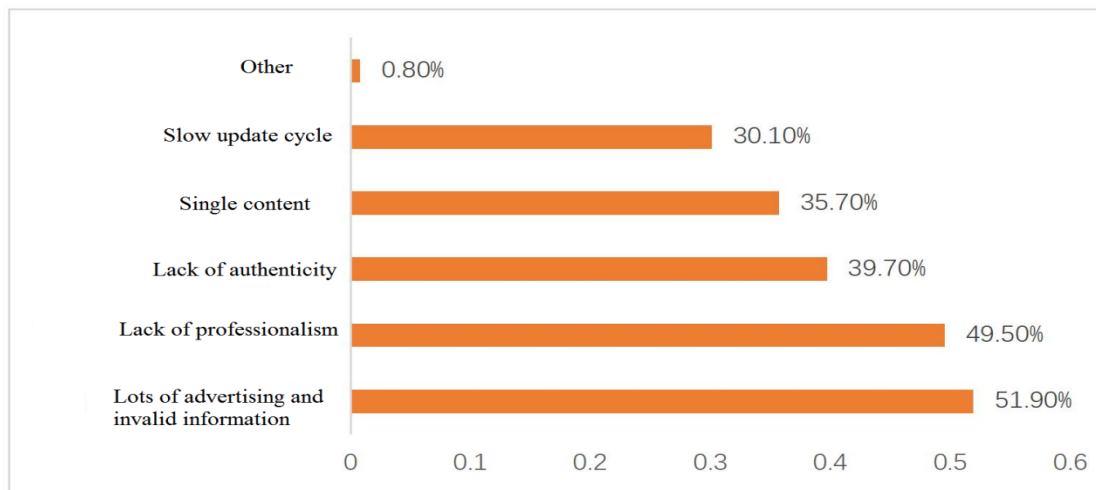


Figure 5-2. Feedback Survey of Knowledge Payment Users on Knowledge Payment Platform in China in 2020 (Source: Hand-crafted by the Author Based on a Report on the Development of China’s Knowledge Payment Industry in 2020 by Ai Media Entertainment Industry Research Center)

5.1.1 Generalised Entertainment of Product Content

During the development of the Zhihu platform, the platform has been inviting all kinds of net stars with a huge fan base and outstanding ability to attract fans to join the platform, hoping to quickly bring large-scale users to the platform through the star effect. To this end, the platform has even put down the bottom line of its auditing standards, seeing traffic as the only criterion, ultimately leading to the platform's content becoming more and more entertaining and vulgar (Barquet, 2011). The most prominent example of this is the introduction of the internet celebrity Wang Sicong. After the introduction of Wang Sicong, users continued to consult him about various aspects of his private life, and Wang was happy to answer. To date, Wang has 34,061 followers, 4,953 questions and 88,306 posts discussed on the Zhihu platform, spanning a period of about five years, with an average of 990.6 questions per year. For Wang's topic attributes are always inseparable from news entertainment, and the results of a random search conducted by the author during the study period show that even Wang's search recommendation terms are full of entertainment temptation, as shown in Figure 5-3. It is based on the accumulation of such phenomena that the professional knowledge brand image of the platform is completely subverted.



Figure 5-3. Relevant Data on the Discussion of Zhihu Wang Sicong's Topic

(1) Pursuing the star effect. It should be said that the most effective marketing campaign in the information age is the celebrity effect. The huge benefit of the celebrity effect is the huge fan base behind the stars, which can quickly bring a large amount of user traffic to the platform. In addition to this, the news and gossip of the celebrities themselves is a highly effective relaxing drug for the entertainment-hungry Chinese public. So, even if pan-entertainment does some damage to the platform's content, the advertising effect it carries is still a mixed blessing for the platform in its formative years.

(2) Lack of IP resources. If the introduction of stars is for the huge user traffic brought by the star effect,

then the pan-entertainment of platform content has to be attributed to the extreme lack of quality IP resources on the platform itself. It can be said that no platform can completely de-emphasise entertainment, but a successful platform should have far more resources for quality content than for entertainment. Platforms are not bringing in the right amount of quality IP resources or incubating quality IP resources while bringing in stars, so the generalisation of platform content will only get deeper according to the broken window effect.

5.1.2 Lack of Integration of Product Content Fragmentation

From the moment knowledge payment platforms were born, most of the platforms produced knowledge to cater to users' fragmented time and to meet their effective use of fragmented time. However, fragmented knowledge and information can still satisfy users' shallow need for knowledge in the early free stages of knowledge payment (Osterwalder, 2010). However, as the users' living and development space continues to change, their new and changing needs are not satisfied with the fragmented knowledge produced by various platforms, they are more eager for systematic and vertical professional knowledge to combat the increasing uncertainty in the workplace. According to a survey conducted by Ai Media on the selection factors of user platforms, the top three are the richness of product content, product cost effectiveness and product reputation (as shown in Figure 5-4). This shows the importance that users attach to product content when choosing a paid platform.

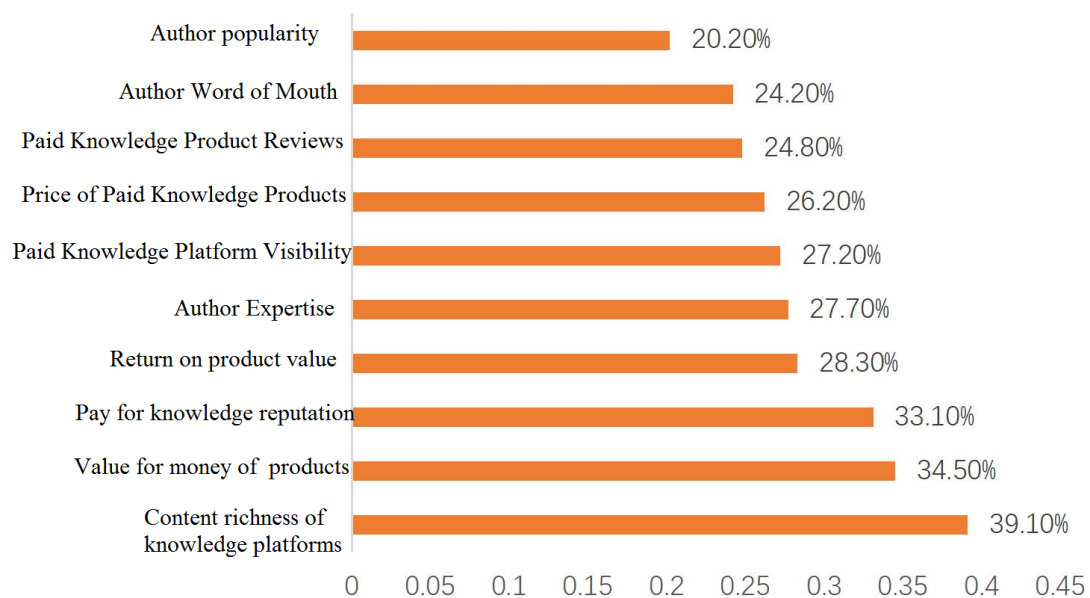


Figure 5-4. TOP10 Survey on Platform Selection Factors of Chinese Knowledge Payment

Users in 2020 (Source: Hand-crafted by the author based on the 2020 China Knowledge Payment Industry Development Special Report by Aimedia Entertainment Industry Research Center)

In addition to this, the fact that the major platforms are still in a state of survival where they choose competition over cooperation has led to a serious fragmentation and homogenisation of the knowledge

produced by the major platforms. Take the topics on Zhihu platform for example, the knowledge on workplace, education and emotions covered by its topics, although they all have corresponding content, show a large split between their content and content (Karson et al.,2006). Even if the topics are under the same theme, they are either crossed or fragmented, unable to form a unified and systematic knowledge system, which will gradually make users lose interest in the content and platform in the long run.

(1) Insufficient IP output. It should be said that the fragmentation of Zhihu's content is relatively large compared to other knowledge payment platforms. The reason for this is the question-and-answer style of UGC, which is the platform's content production mechanism. Letting users produce content is tantamount to leaving all questions and answers to the users, resulting in low relevance of content across the platform. Since "if it fails, it can also succeed". Therefore, the only way to solve the problem of low relevance of platform content is to improve the quality of the output content of IP resources.

(2) Lack of governance over product quality. It should be said that the biggest problem with the Zhihu platform is not a lack of content, but a lack of content governance. What is content governance? Content governance is about filtering, aggregating and standardising output. The Zhihu platform is full of discussions on a single issue, and the platform needs dedicated people to screen, aggregate and standardise the output of these answers, which will inevitably bring higher quality value to the platform users.

5.1.3 Product Content Is Highly Homogenised

Since their inception, P2P knowledge platforms have been serving a demographic that is almost exclusively professional people aged 20 to 45. The initial problem of P2P knowledge was to provide this group of people with quality information resources to help them obtain more useful and effective information in a limited time frame, including information on the workplace, children's education and entertainment (Hsu et al., 2007). According to a survey conducted by Ai Media on the types of products users choose to pay for knowledge, the three main types of products generally favoured by users are leisure and entertainment, skills training and finance and economics (as shown in Figure 5-5). The highly overlapping user needs have led to confusion and ambiguity in the positioning of most platforms in the industry. The ambiguous positioning of the platforms has prompted them to imitate their competitors in order to qualify for not being eliminated by them. It is therefore easy to see that homogenisation of products and services is an efficient competitive strategy for each knowledge payment platform. Secondly, the knowledge-paying customer base belongs to the earliest generation to access the Internet, and is ambiguous about the value claims provided to them by knowledge-paying platforms. As a result, the customer base takes a holistic approach to platform selection based on the types of products and services offered by each platform, which has led to a growing trend of product and service homogenisation between platforms.

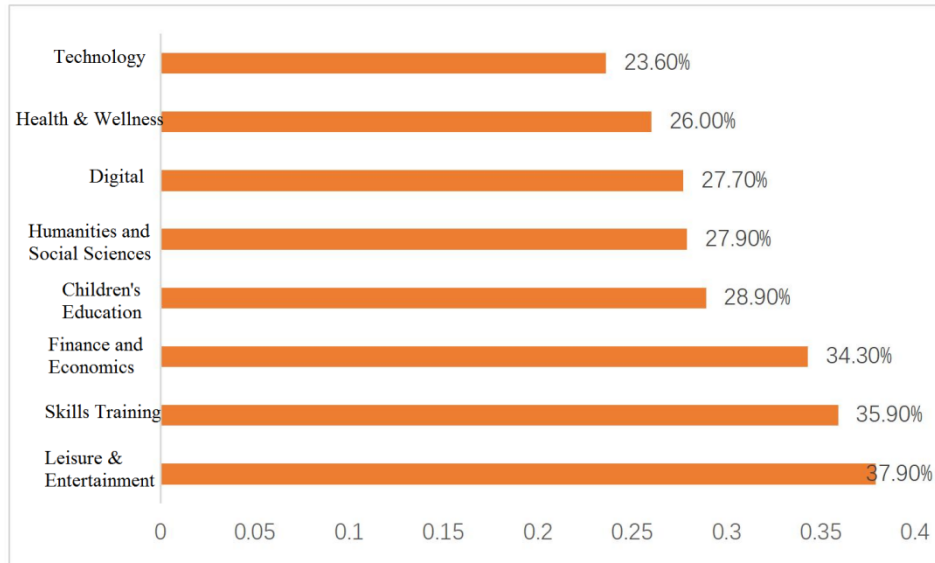


Figure 5-5. TOP8 Survey on Product Types of Knowledge Payment Users in China in 2020

Source: Hand-crafted by the author based on the 2020 China Knowledge Payment Industry Development Special Report by Aimedia Entertainment Industry Research Center.

(1) Convergence in value positioning. It should be said that since its inception, knowledge payment has served the earliest group of people growing up in the information age. This group of people, aged between 20 and 45, has experienced the growth of the Internet throughout its existence in China. So for them, knowledge payment is a widely accepted quality service (Grether, 2016). It is for this reason that there is a striking consistency in the value proposition and content produced by the various knowledge payment platforms. According to an age survey of paid users by Ai Media Research, 71.7% of paid users are aged 24-41, accounting for more than two-thirds of all paid users (as shown in Figure 5-6). These paid users choose to pay because they want to acquire professional knowledge (see Figure 5-7).

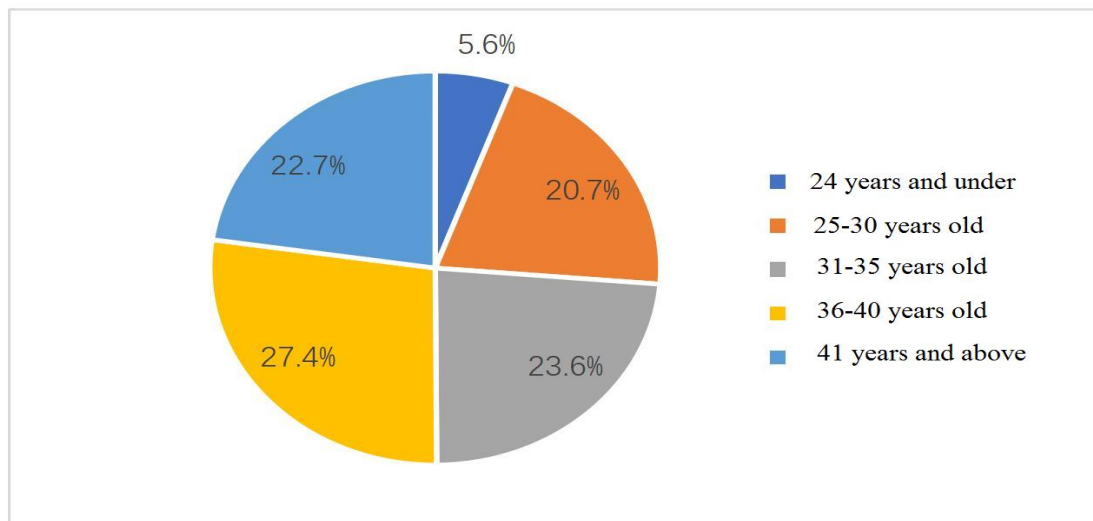


Figure 5-6. The Age Distribution of Knowledge Payment Users in China in 2020

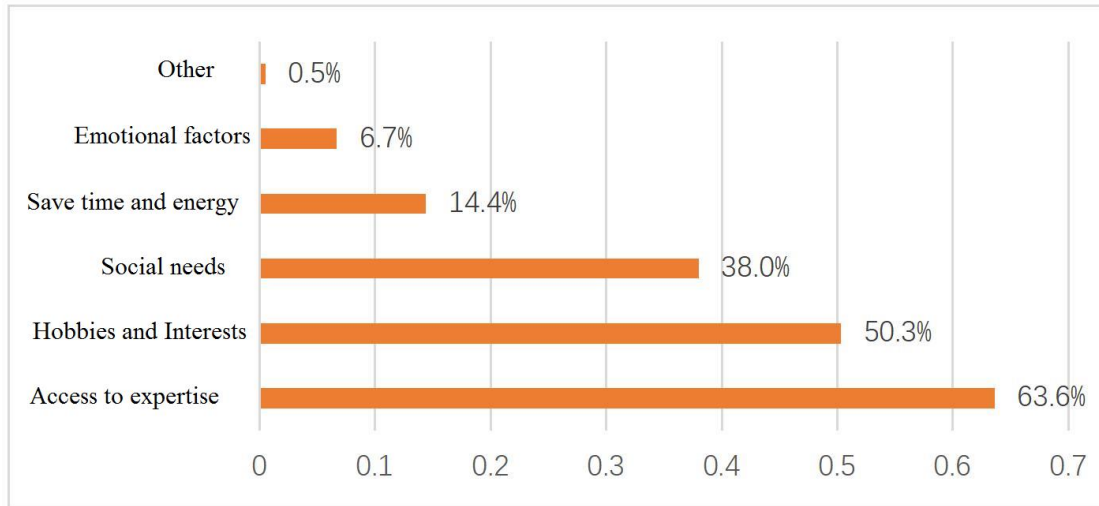


Figure 5-7. Survey on the Reasons for the Use of Knowledge-Paying user Platforms in China in 2018

Source: Hand-crafted by the author based on the 2020 China Knowledge Payment Industry Development Special Report by Aimedia Entertainment Industry Research Center.

(2) Undue interest drive. The high overlap of customer groups has driven various knowledge payment platforms to respond to the creative content production of their competitors by imitating them, and the imperfection of national laws relating to intellectual property and copyright has also exacerbated the trend of imitation.

5.1.4 Frequent Product Content Infringement Problems

Looking at the development history of knowledge payment platforms, it should be said that original knowledge works continue to satisfy users' needs while driving the benign development of the knowledge payment industry. For Zhihu, which is a question-and-answer community, the number of original works incubated on the platform is relatively large and the quality is relatively high. Among them, "Zhihu Highly Commended" has become the highest rating for countless original works. As a result, the huge profits from copying, reproducing and republishing the "highly-rated" works on Zhihu platform have led to the most prominent cases of infringement on Zhihu platform among the many paid knowledge platforms (Dubosson-Torbay, 2002). Those who infringe often do so by copying highly-liked works in full page, either without attribution or by adding the words "infringement must be removed" at the end, in a vain attempt to avoid the essential attribute of infringement. In addition to this, there is also the practice of "copy-washing". Users copy and relocate quality works from other platforms to the Zhihu platform, and then re-publish some of the content by "shuffling" the original work, in order to reap the benefits of being on the Zhihu platform. Some of these cases are shown below.

Table 4-1. Some Infringement Cases of Zhihu

Time	Knowing infringement cases	Infringement publishing platform	Does the infringer remove it after notification	Whether the original author received financial compensation
2017	What Begins on Day One, Persists for Life	New Studio Company	Yes	No
November 2017	7 articles involved	Weibo	Yes	No
2020	The Time Machine	Zongheng Chinese Website	Yes	No
January 2021	Zhilan Learning Society	Zhihu Platform	Yes	No

(1) Low cost of infringement by users. On the Zhihu platform, readers can often see many images or content marked with the word “infringing”. This simple “wording” is often the most common and self-serving way for users to legitimise their infringement. By doing this very simple act, they obfuscate the fact that they are infringing by making it clear to any readers who find them to be infringing that their motive is not infringement, but simply borrowing. This phenomenon is a common occurrence on the Zhihu platform. The reason for this is that it is extremely cheap to implement, but expensive to defend.

(2) Copyright regulation is difficult. In terms of the existing mechanism for producing UGC content on Zhihu, it is still difficult to enforce copyright on Zhihu. The reasons for this are twofold: Firstly, it is difficult to define the copyright of content produced by the platform through UGC. The second is that many infringement methods are not just plagiarism, but rather “copy-writing”, in which various texts and examples are cross-referenced and rewritten to weaken the similarity of the original content.

(3) The relevant laws are not perfect. The Internet knowledge payment model has only been developed in China for a few years, and there is no widely accepted regular conclusion on the characteristics of the commercial phenomenon of knowledge payment. Therefore, the state has not yet been able to establish the relevant laws for this.

5.2 Lack of Competitiveness in Product Services

For the platform, product service is its key competitiveness. With empty product content and no perfect service measures, customers’ viscosity to the platform will be reduced. According to experiential marketing theory, customer viscosity directly determines the customer’s repurchase rate and the customer’s brand image memory (Morris, 2003). The product recommendation service of the

knowledge payment platform is formal and does not provide systematic knowledge products for long-term customer goals. At the same time, the high price of products and the lack of after-sales service for customers caused by the pricing mechanism of products contributed to the development crisis of the platform, whose logic is shown in Figure 5-8.

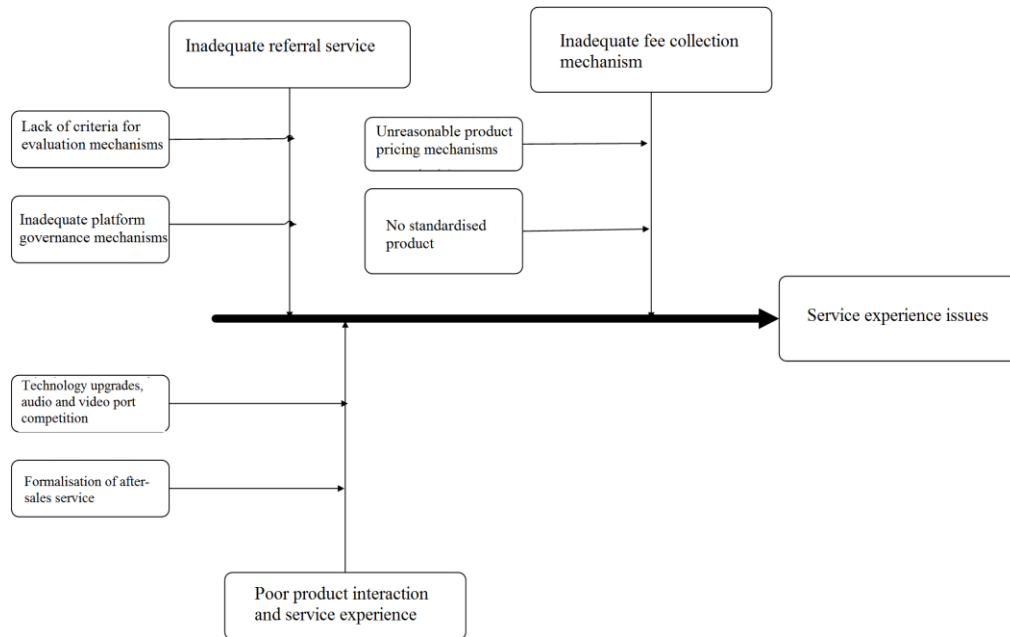


Figure 5-8. Product Service Experience Problem

5.2.1 Recommendation Services Are a Formality

Arguably, the most core commercial service that has been implemented on the Zhihu platform is consulting, i.e. text consulting and voice consulting. However, after the consulting services, Zhihu's services seem to stop. There is no way to know whether users have successfully solved their inner questions after receiving the corresponding consulting services on the Zhihu platform, and whether they want more vertical and specialised services from the Zhihu platform (Hamel & Trudel, 2001.). Therefore, it is the single-transaction feature of Zhihu's consulting services that causes a disconnect in user services, so much so that the platform's corresponding peripheral recommendation services cannot be realized.

- (1) The evaluation mechanism lacks standards. The lack of effective evaluation standards for both user-generated knowledge and IP-based answers has led to uneven content on the platform.
- (2) The platform's governance mechanism is not perfect. It should be said that the greatest core resource of the Zhihu platform is the content of questions and answers on various topics produced by users since the platform's inception. However, the quality of these huge numbers of questions and answers varies, and without appropriate governance, the platform's development will stop there. Therefore, the quality of content on the platform needs to be governed to filter out high quality content.

5.2.2 Inadequate Payment Mechanisms

There are two main ways of pricing knowledge payment platform products: one is monopoly pricing by knowledge producers; the other is pricing after negotiation between knowledge producers and the platform (Roy, 2009). Platforms often choose producer monopoly pricing because they lack unified measurement standards and can only give producers a complete monopoly on the pricing power of the products they produce. The price set for this monopolistic approach is generally very high, such as the “Lo Hammer” which is worth several thousand dollars at the drop of a hat. This type of pricing, which is much higher than general knowledge, is very detrimental to the long-term development of the platform.

(1) The product pricing mechanism is unreasonable. As we know from the pricing mechanism of Zhihu platform, it gives most of the pricing power of knowledge Q&A to the answerers. For Zhihu, this is a great way to increase the motivation of respondents and the quality of their answers. However, even the highest quality answers should not be encouraged and rewarded at a price much higher than the average market price. Secondly, quality is highly subjective, and it is difficult to equate “price with effectiveness” at a high price, which in the long run will make this feature lose favour with the mass market.

(2) No standardised product. Without governance of the content on the Zhihu platform, it is impossible to develop high-quality content and standardised products, and the absence of standardised product content will only discourage knowledge consumers and reduce the number of transactions, resulting in a lack of stable revenue and profits for the platform and knowledge providers.

5.2.3 Poor Interactive Experience Services

With the upgrading of Internet technology, users are tired of knowledge content in the form of text or voice only. Especially with the rise of short-form video platforms, Zhihu’s space for survival has been greatly squeezed (Rathnayake & Winter, 2017). At the same time, with the doubling of the speed of internet broadband, users have raised higher demands on the presentation of knowledge. In response to the rapid onslaught of short-form video, how the original knowledge payment platforms can retain their stable market share has become an inescapable problem for all platforms. In Ai Media’s survey on users’ satisfaction with the content of platform services, the satisfaction level of comprehensive knowledge payment platforms is higher than that of audio and vertical categories, reaching 74%, which shows that the service experience provided by platforms has a great influence on users’ selection of platforms (as shown in Figure 5-9).



Figure 5-9. Quality of Service Content of Integrated Knowledge Payment Platform

Source: Hand-crafted by the author based on the 2020 China Knowledge Payment Industry Development Special Report by Aimedia Entertainment Industry Research Center.

(1) Technology upgrade and audio-video port competition. With the grabbing of users' time by Jieyin Express short videos, the time left for pure text-to-speech form of knowledge content platforms is getting less and less. At the same time, knowledge answers obtained through voice text, short video platforms provide a more interesting, more informative and logical mode of explanation. Existing knowledge payment platforms are facing huge challenges.

(2) Formalisation of after-sales service. In the Zhihu platform, although paid products can be used for product feedback through private chat and reviews, the daily operation staff of the products respond slowly and in a single way, which cannot meet the personalized needs of users arising at any time, and with the accumulation of time, users will eventually switch to other platforms.

6. Strategies for Optimising the Business Model of Knowledge Payment Platforms

This chapter explores the logical path of business model optimisation strategies from three levels. The three levels are: the anatomy of the deeper reasons for the problems of the business model by the new business model theory, the in-depth combination of experiential marketing theory, long tail theory and value co-creation, and the proposal of business model optimisation strategies.

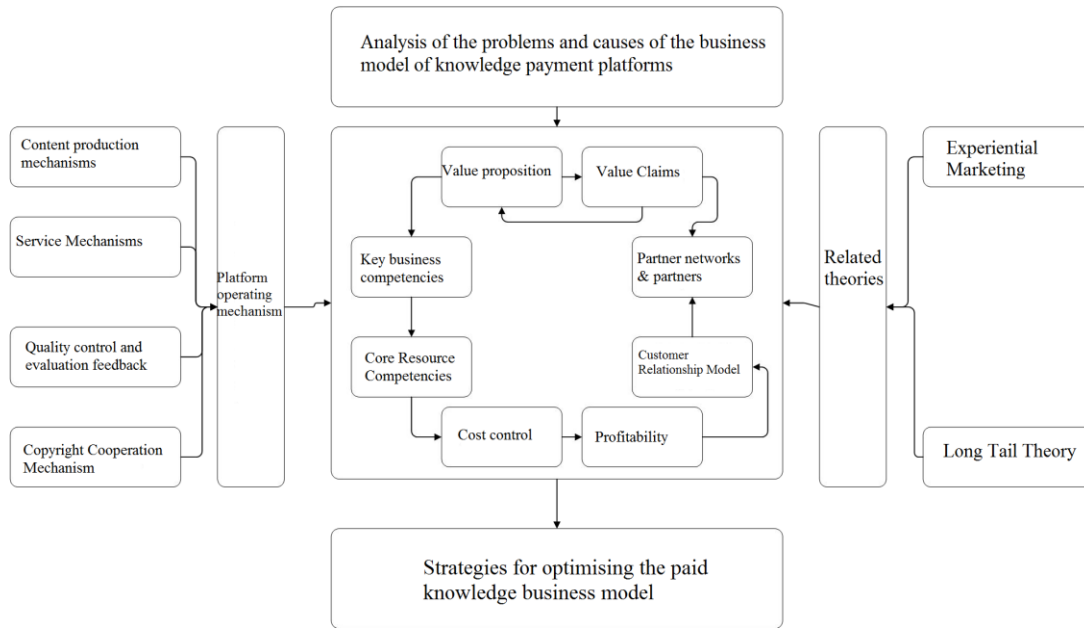


Figure 6-1. Business Model Optimization Logic

As shown in Figure 6-1, from the description and analysis of the problems of Zhihu’s business model in the previous chapter, we have summarized seven problems: the heavy fragmentation of the product; the tendency of the content to be entertaining; the lack of depth and integration; the serious homogenization; the serious problem of product content infringement; the formal recommendation service; the imperfect payment mechanism; and the poor interactive experience service (Westerik et al., 2006). To address these seven problems, this section will systematically analyse them from the perspective of the “eight elements” of the new theoretical model of business models, and propose corresponding optimisation strategies accordingly.

From the perspective of value positioning and value demands: The root cause of the generalized entertainment, homogenization and infringement problems of Zhihu platform is the high overlap between the value positioning of Zhihu and other content platforms. There are three reasons for the high overlap in value positioning:

① High overlap in customer groups. The major knowledge payment platforms serve a new generation of internet users aged between 20 and 40, who have a certain cultural base and social occupation, who have long-term plans and thoughts about their careers, and who follow the development of the internet. These customer groups have been receiving all kinds of information from the Internet since the early days of the portal, and their acceptance of the Internet has been deeply rooted in their bones after more than ten years of precipitation, so they have a strong acceptance of Internet-derived knowledge payment.

② The market demand is not clear or changes frequently, which leads to the platform pursuing short-term interests and satisfying customers’ short-term needs while ignoring or abandoning their

long-term needs.

③ The value demands of customer groups are not clear, strong and distinct, making it difficult for the platform to sustain commercial realisation. Users are used to being satisfied with the fast iterative news and consultation on the Internet.

They are used to the pleasure of information brought by the rapid iterations of the Internet, but are confused and disoriented to varying degrees by the paid knowledge that provides high-quality information.

Analysis at the level of core competencies and key business activities: the root cause of the imperfect payment mechanism and formal recommendation services on knowledge payment platforms is the inconsistency between customers' continuous value demands and the platform's own positioning. Customers' demand for Internet information gradually changed from free and fragmented curiosity exploration in the early days to systematic and paid knowledge of career and workplace-related fields (Amit & Zott, 2001). The platform is aware of the rapid changes in customer needs, but does not improve the corresponding product content production mechanism, resulting in the lagging of product content and service capacity, coupled with the lack of effective evaluation standards and evaluation mechanisms for product quality, and the inability to standardize and batch products, resulting in a continuous decline in customer experience of platform products, and the platform eventually loses customers (Baghai et al., 2009). Analysis of the customer relationship model: the root cause of poor interaction experience is the lack of long-term operation of the platform for customer needs. Without long-term operation of customer needs, the platform loses timely understanding and response to customers' continuous needs, resulting in a decrease of customers' viscosity to the platform, and the platform eventually loses customers.

Analysis of the three levels of cooperation network and partners, profitability and cost control: it should be said that the first four levels of problems led to the results of these three levels, that is, when the value positioning and value demands do not match, the core competence resources and key business activities can not accurately match the changing user needs, coupled with the failure to provide continuous comprehensive customer relationship maintenance services, can not continue to follow up on customer ideas, and ultimately caused Unsustainable profitability and fragile partnership networks (Chesbrough & Rosenbloom, 2002). In terms of value, the first four are value proposition, value co-creation and value maintenance, while the last three are value realisation. To solve the problem, strategies need to be developed at the level of value proposition and value claims, core competencies and key business activities and customer relationship models.

6.1 Optimisation Strategies for Value Proposition and Value Claim

The analysis of the above business model shows that in order for Zhihu to achieve sustainable competitiveness in a market with high customer overlap and unclear customer demands, it is necessary to first gain insight into users' brand perceptions of Zhihu's content community-based platform, and secondly, after gaining insight into users' brand perceptions, it is necessary to tightly grasp the brand

image and work hard to establish a core competitive advantage with the brand as the core. The results of the research report on the value of Zhihu's content over the period 2021-2022 from the Cato platform clearly show that users choose Zhihu as a platform for daily knowledge acquisition, product information consultation and product reviews because the content produced by Zhihu is highly professional, in-depth and rigorous compared to other platforms (see Figure 6-2). At the same time, the main purpose of using Zhihu is to learn and gain knowledge (see Figure 6-3), and users gain a greater sense of self-improvement, knowledge and help after using the platform (see Figure 6-4). Therefore, to improve the professionalism and richness of the platform and to give users a more continuous sense of gain is the direction in which the value positioning and value claims of the Zhihu platform need to be optimised.

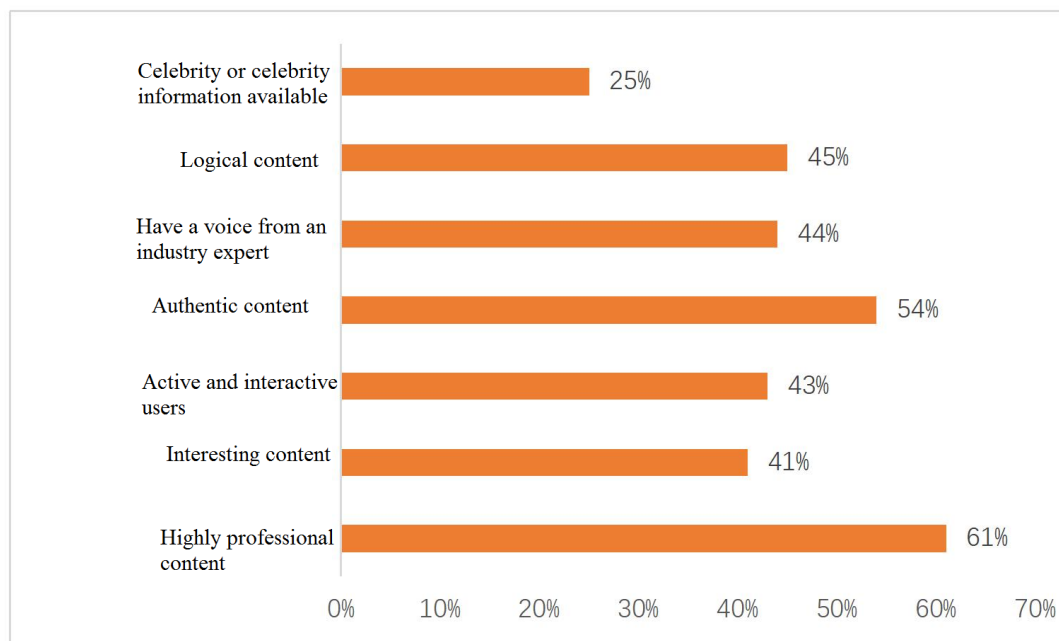


Figure 6-2. The Main Reasons for Using Zhihu Platform

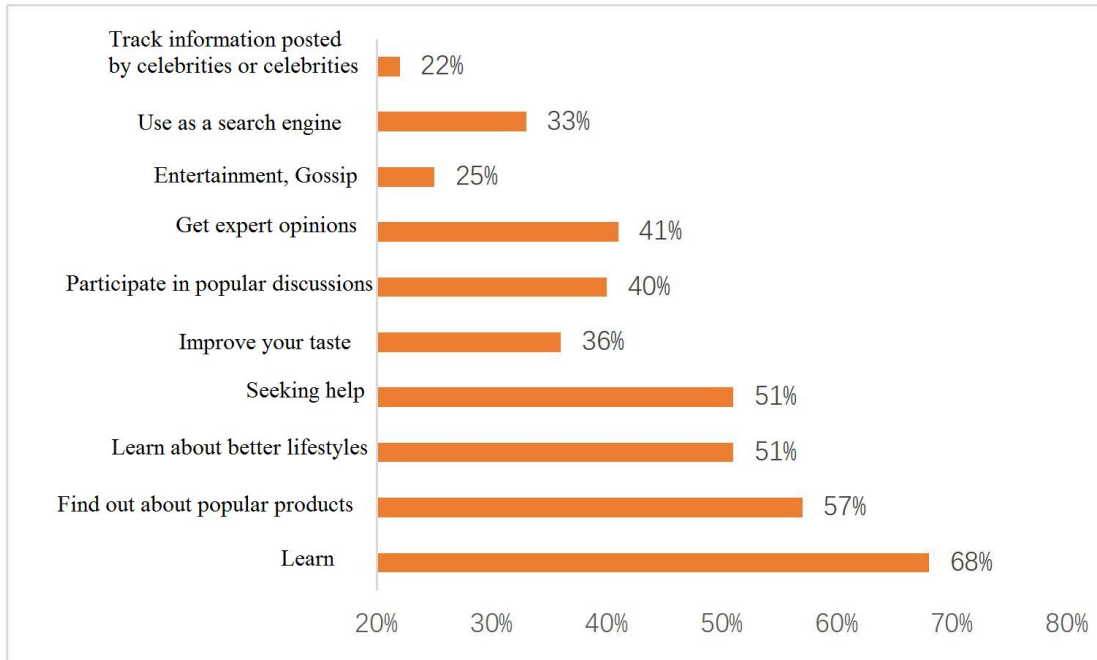


Figure 6-3. Purpose of Using Zhihu Platform

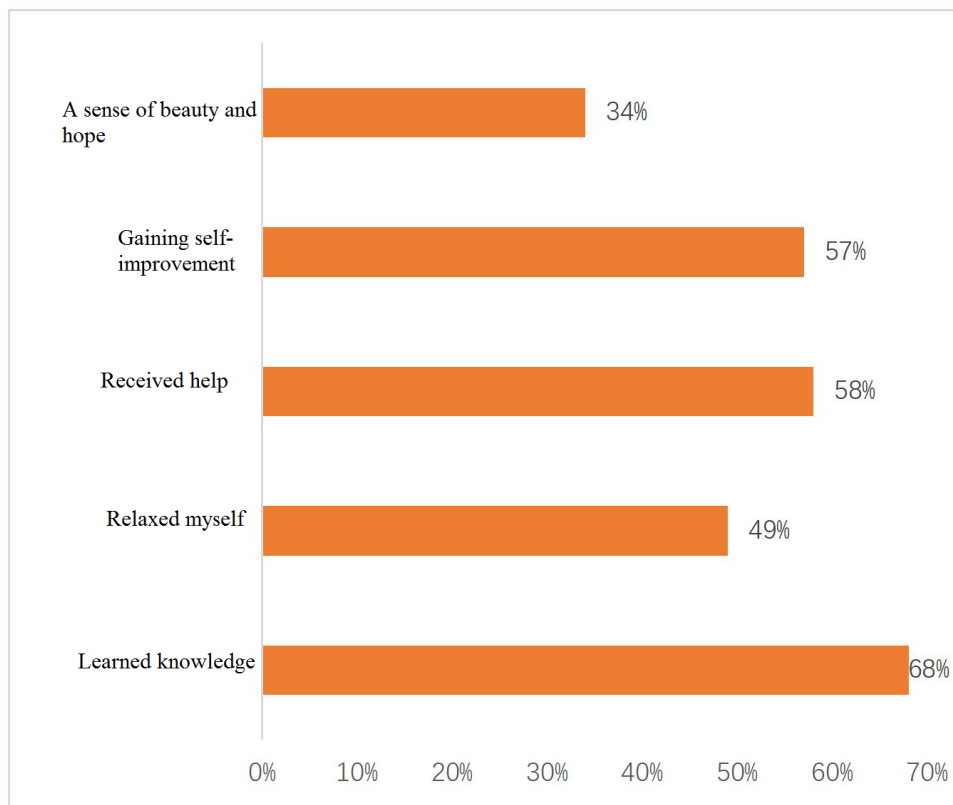


Figure 6-4. Feelings after Using Zhihu Platform

(1) Positioning knowledge payment as knowledge service. From the perspective of business model, transforming the value proposition of knowledge payment from knowledge payment to knowledge

service can fundamentally solve the problem of fragmentation and homogenization of knowledge payment. Knowledge payment itself focuses on the production and consumption of knowledge, but tends to neglect the continuous after-sales and customer relationship maintenance after knowledge consumption, resulting in the value proposition of knowledge payment not being able to continuously follow the ever-changing customer value demands. In addition, transforming short-term knowledge payment into long-term knowledge services means that knowledge payment platforms need to do two things: 1. continuously follow up with customers and maintain customer relationships; and 2. continuously provide corresponding services through customer feedback. This means that the platform needs to reconsider the knowledge production mechanism, knowledge consumption, maintenance and after-sales mechanism. While implementing the new value proposition, the platform addresses the long-term demand of customers for systematic knowledge, thus breaking the impression of customers' fragmented knowledge on the platform. At the same time, continuous follow-up of customer needs and long-term customisation of services for customers help the platform break through the fate of homogenisation.

(2) Positioning from catering to desire to interest guidance. The value appeal of knowledge payment platforms is the key to attracting users and retaining them. In the early days of knowledge payment platforms, the biggest goal of their development was to grow their user base, so the value claims were set to meet the needs of users. Some platforms set their value propositions in a way that catered to users' desire for vulgarity in order to get more user traffic faster, driving platform maintainers and regulators to turn a blind eye to the quality of the platform's content, leading to the generalisation of the platform's content. However, sacrificing content for traffic is only a temporary expedient for business development. If the platform does not transform its value proposition, transforming the desire to cater to interests, it will only be completely abandoned by users. No user will always choose a platform that only satisfies their simple desires. Once the user's mind is mature, the platform will be completely abandoned.

6.2 Optimisation Strategies for Core Competencies

Core competence resources are one of the core elements of the value co-creation process of the knowledge payment platform business model, mainly including the content production mechanism and interaction mechanism of the knowledge payment platform. The core competence resources of the platform determine the platform attributes and the interactive relationship network of the platform content, which is the core competitiveness of the platform. According to the analysis in the previous section, the core competency resources of Zhihu platform are content production mechanism and content matching algorithm (Hedman & Kalling, 2003). According to a research report on the choice of knowledge/content platforms by Cato, 94% of users believe that good content influences their purchase decisions, which is an important reason why users prefer knowledge/content platforms to obtain information, as shown in Figure 6-5. The research report shows that users' favourite content formats of knowledge payment platforms are "reviews or comparisons of multiple products" and "scientific

knowledge”. “Therefore, providing specialised content for users and accurate recommendations to users in need is a challenge for the business model of Zhihu platform. Therefore, providing specialised content to users and recommending it accurately to users who want it is a challenge for the platform’s business model.

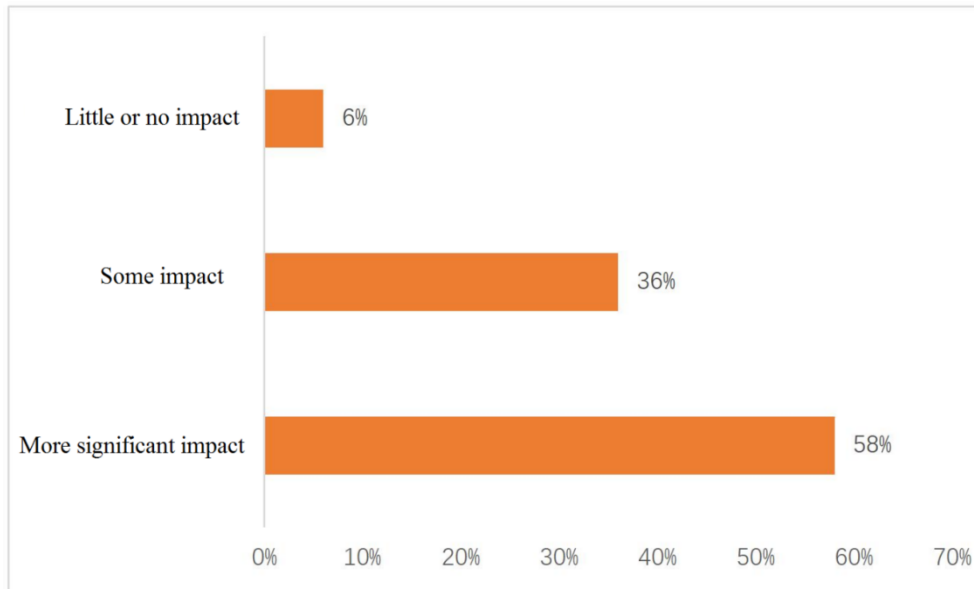


Figure 6-5. The Influence of Knowledge Content Platform on Consumption Decision

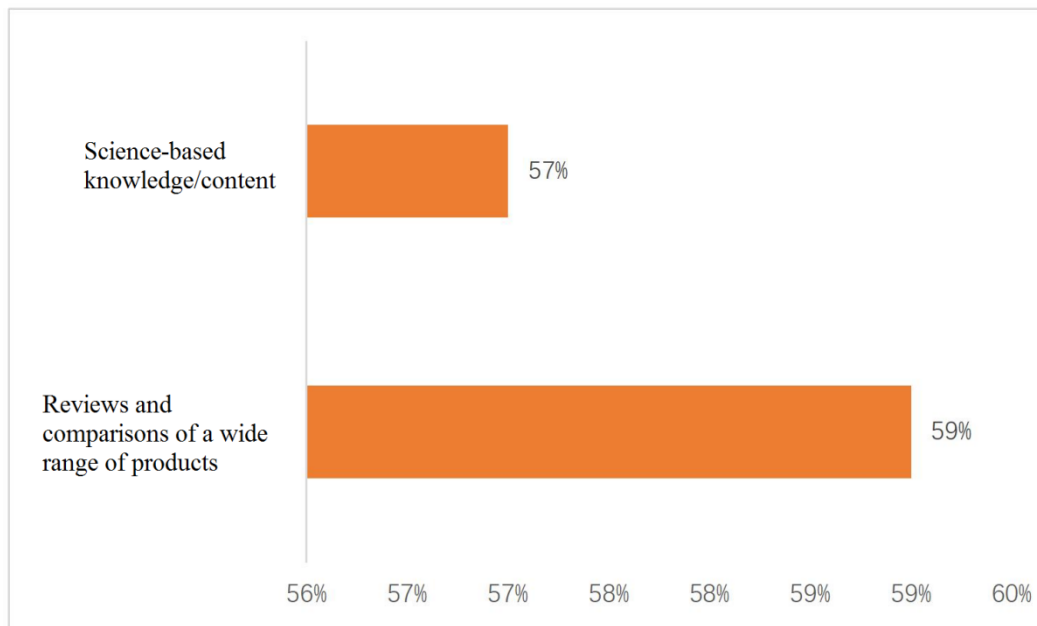


Figure 6-6. Content Forms That Users Are Most Interested in

Based on this, the following strategies have been developed to address product and service issues.

(1) Content production, vertical specialization and rich long-tail in parallel. The most successful mechanism for producing content on the Zhihu platform is the independent discussion of registered users, and the corresponding mechanism behind it is the user self-production mechanism. The greatest benefit of the user-production mechanism is that it is knowledge-rich, social, easy to understand and actionable. However, the biggest disadvantage of user self-production is that it is fragmented and difficult to aggregate. We all know that conversation is not knowledge, but conversation can produce knowledge. So how to make the countless conversations on Zhihu and the knowledge behind them work for the users themselves in the right way requires a deeper understanding of knowledge. Therefore, in order to resolve the irreconcilable conflict between the self-production mechanism of users and the nature of knowledge, the platform needs to work on two fronts simultaneously: on the one hand, through the overlapping content of conversations, it selects the most popular topics and knowledge, and then deepens and verticalizes this knowledge to provide systematic knowledge to users (Johnson et al., 2008). On the other hand, we continue to enrich the various types of original topics to cover as many topics as possible that are likely to be voted on by the general public, taking advantage of the value premium brought by the long-tail theory to increase the overall value of the platform (Osterwalder, 2004).

(2) Content matching, establishing data standards and improving data governance. For the core resources of the Zhihu platform, the degree of algorithmic matching between questions and responders is at the core of it. Not all questions are assigned to all users to answer, and not all respondents are assigned all questions from all users. The degree of matching between questions and answers relies on three elements: 1. the precise definition and classification of the content; 2. the precision of the algorithmic model; and 3. the behavioural patterns of the respondent (Kothandaraman & Wilson, 2000). Of these two elements, the precise definition and classification of content is more important than the algorithmic model, i.e. if the definition of content is not precise and the classification of content is not possible, then it is tantamount to losing the core resources of the Zhihu platform. The core to achieving accurate definition and classification of content is to establish standards. Establishing data standards, through data governance and standardised fields and standardised platform data, will enable accurate definition and matching of content distribution.

6.3 Optimisation Strategies for Key Business Activities

Key business activities are one of the core competencies of knowledge payment platforms that cannot be replicated. They determine the key to the survival of the platform and are a key constraint to its continued development. In the previous sections, we analysed in detail the problems of the key business activities of Zhihu platform, which are due to the imperfection of various mechanisms, resulting in the poor usefulness of the recommendation service and the imperfection of the payment mechanism of Zhihu platform (Petrovic et al., 2001). Therefore, improving the payment mechanism and recommendation algorithm is the direction that Zhihu needs to be optimized. In addition, a study by Cato on the influence of Zhihu on users' choices and decisions shows that multi-dimensional user

feedback is a key factor influencing users' decisions, with the use of the platform's commenting and sharing feedback function being a typical and important factor, as shown in Figure 6-7. The research report also found that the platform is not only a good place to share feedback, but also a good place to share it. The research report also shows that users increasingly prefer to use multiple platforms alternately to verify each other's knowledge content, as shown in Figure 6-8, which requires Zhihu to build up information copyright mechanisms with more other platforms.

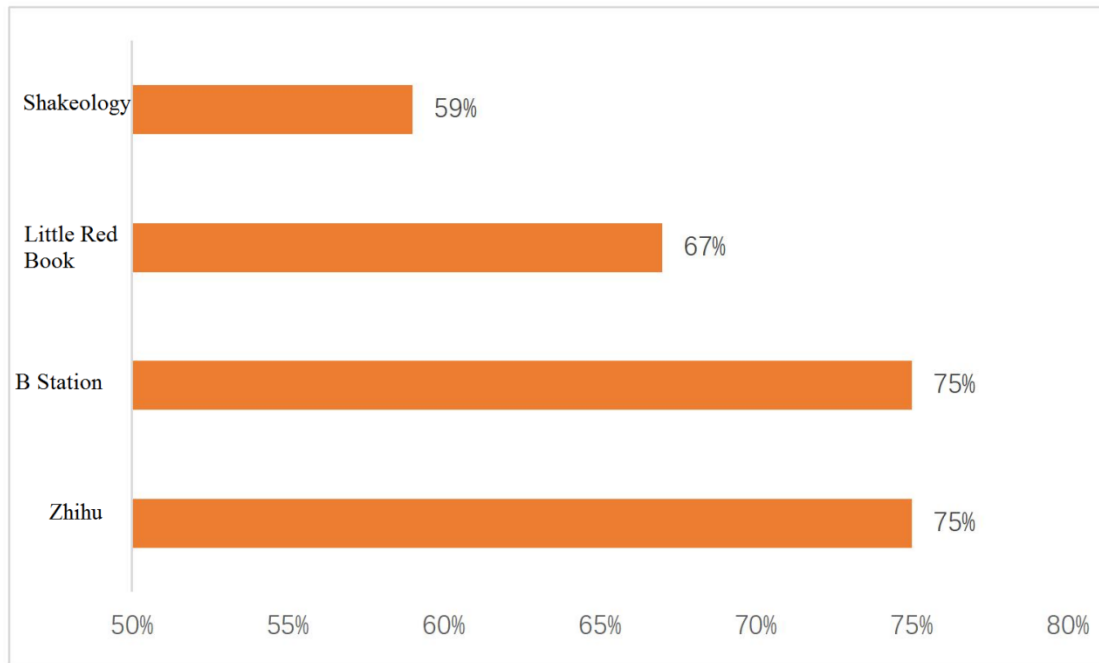


Figure 6-7. The Extent of Using Comments and Sharing

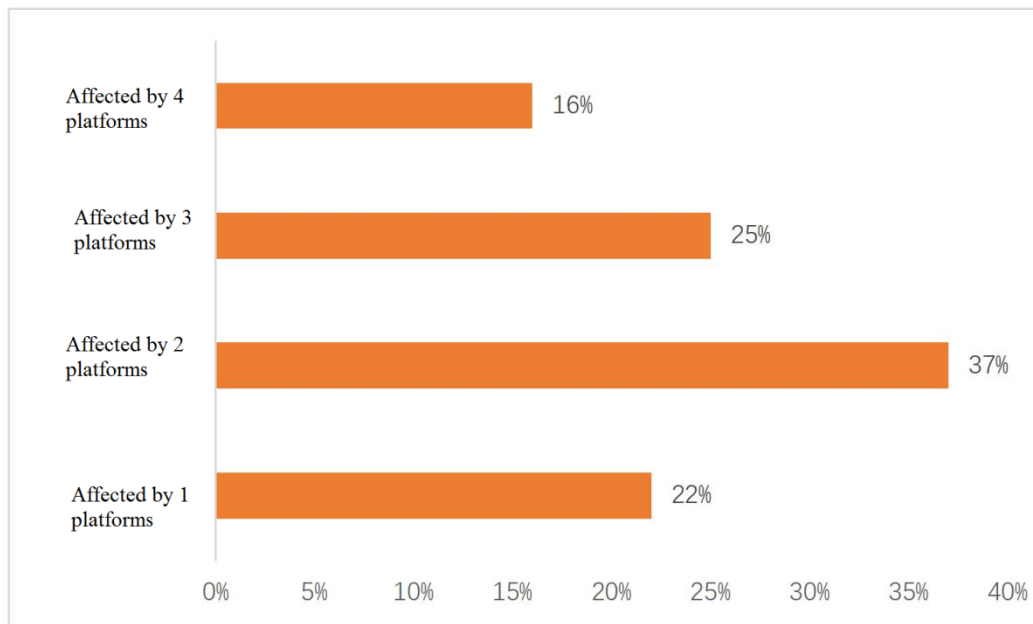


Figure 6-8. Number of User Decisions Affected by Platform

Based on this, the following strategies are formulated for product and service issues, from the perspective of platform mechanism construction.

(1) Establish a product quality monitoring and feedback mechanism. The core part of a knowledge payment platform is the provision of content and services, so the quality of the platform's content must be improved in order to sustain the platform's competitiveness. The content produced by the UGC and PUGC (expert-generated content) mechanisms should be monitored and feedback mechanisms established to screen out low-quality and vulgarised content in a timely manner to avoid the continued amplification of the broken window effect on the platform.

(2) Deepen the evaluation mechanism. Compared to physical products, the experience cost of most products on knowledge payment platforms is relatively large, due to the immaturity of the knowledge payment market and the subjective nature of knowledge products. Users can only have a certain understanding and knowledge of product quality after purchasing and using platform products, which leads to users relying entirely on their own trust in the brand power of knowledge platforms when purchasing knowledge products. This purchase dilemma has led to a large number of purchases being concentrated on a few head platforms in the knowledge payment industry on the one hand, and on the other hand, it has also led to the head platforms squeezing the survival space of the tail and middle platforms (Teece, 2010), contributing to the unhealthy development of the industry. Once the quality of the top platforms declines, the industry will see a shrinking demand market. Therefore, we should deepen the evaluation mechanism of existing knowledge payment platforms, incorporate product quality evaluation into the selling price system of products, and continue to deepen the free trial mechanism to increase users' understanding and advance experience of product content.

(3) Jointly build copyright mechanisms with other platforms. It should be said that the issue of knowledge copyright on internet knowledge payment platforms is an issue that the whole industry needs to face together, which also leads to the inability of individual platforms to complete the construction and management of copyright on their own platforms alone, and the inability to effectively protect the rights of defenders. Therefore, platforms should join together to establish a unified copyright mechanism, standardise the definition of copyright and form a unified industry constraint.

6.4 Optimisation Strategies for Customer Relationship Models

According to the four types of experience in experience marketing theory: culture, scenario, emotion and process experience, for the maintenance of customer relationship, a breakthrough can be implemented from several levels such as building community culture, expanding service scenario, deepening emotional experience and extending the experience process to effectively solve the problems of audio medium crisis and port migration (Timmers, 1998). According to a research report by Cato on the content forms of interest to users of the Zhihu platform, users prefer "popular knowledge of products", "in-depth analysis of products by professionals", "hardcore parameters of products", "analysis of technical parameters", and "hardcore parameters of products". It can be seen that users on the Zhihu platform are accustomed to or prefer interactive communication to learn about products and

products. It can be seen that users on the Zhihu platform are used to or prefer to learn about knowledge or confirm the purchase of a product through an interactive exchange. Therefore, the strategy for optimising the customer relationship model on Zhihu is to build a pleasant and relaxed community environment and communication atmosphere. The specific strategies are as follows.

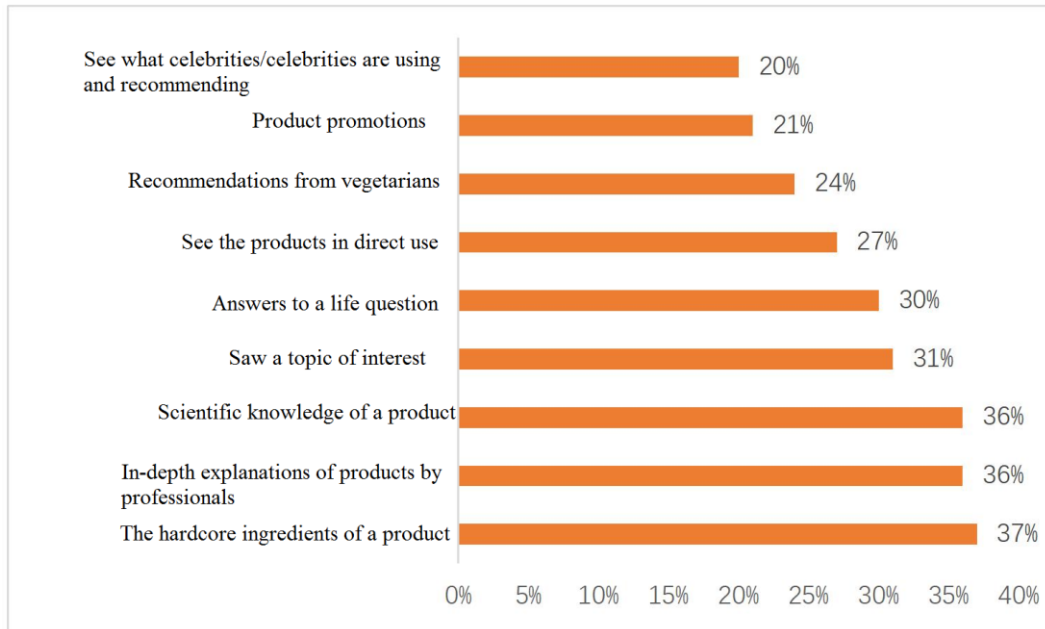


Figure 6-9. Content Forms that Users are Interested in

Strategy 1: Build a community culture and deepen the service experience. The Zhihu platform started as a knowledge-based Q&A community and gradually opened up its business path. However, the nature of the Q&A community is only a point-to-point or point-to-line surface form, lacking a three-dimensional and in-depth form of communication between the line and the point, and unable to meet the deep service experience between the point and the line (Weill & Vitale, 2001). If we look at knowledge as a commodity, the Q&A community itself is like a customer service system, which only solves the customer's understanding of the commodity they need, but does not help them solve their problems, which means that the user value has not been explored and satisfied ^[74]. Therefore, it is necessary to break through Zhihu's original point-to-point single-line model, establish a stable community culture, and deepen the relationship between community points and points. On this basis, we will build a service community, providing users with a more multi-dimensional service experience and establishing an effective evaluation mechanism through the use of responsive shopping mall services and in-depth and systematic consulting services.

Strategy 2: Upgrade and extend the user service experience. The biggest role of big data technology for the platform is that it can help the platform achieve personalised results for thousands of people. However, no matter how many other elements are involved in a knowledge community, its core is still

the community. The essence of a community is social, and communities that lack multi-level social interaction are easily abandoned by users. Therefore, we adopt a big data approach to expand the social attributes of the platform, strengthen its social service function, deepen and extend the connection between points, and complete the deep connection of users to the platform.

7. Conclusion

7.1 Conclusions of the Study

(1) The essence and keys of the business model of knowledge payment platforms are summarised. 1. The essential attributes of the business model of Internet knowledge payment platforms are basically the same as those of traditional knowledge payment, with products and services as the core of their entire system. Therefore, strict control of product quality and systematic and comprehensive improvement of the whole process service mechanism are the keys to the success of the whole business model 2. The paid knowledge of the Internet platform presents different characteristics from the traditional knowledge system in terms of value demands, with short-term and discontinuous nature. Therefore, for the strategic positioning of knowledge payment platforms, in addition to attaching importance to the current needs of knowledge payment users, it is also necessary to continuously track the potential long-term needs of users. Only by meeting the short-term and long-term, current and future needs of users can the platform achieve sustainable and stable development.3. Unlike traditional over-reliance on external marketing channels, the value co-creation process of the Internet knowledge payment platform business model presents a closed-loop profit model, with the community effect of the value network accomplishing a win-win situation for partners, the platform itself and relevant stakeholders. Therefore, it is necessary to focus on and strengthen the key nodes of knowledge communities, actively expand new external nodes, introduce more interest ecological chains and expand the capacity of the value network.4. At present, the conditions that can continuously promote the healthy and good development of platforms are the provision of quality product content and professional and comprehensive community services, the key to these two depends on the speed of platform technology upgrading, the scope of the community effect and the level of IP incubation capacity.

(2) To analyse the problems of the platform's business model development with the help of new business model theory, and provide corresponding strategies accordingly. The problems are: the quality of products is fragmented, generalised entertainment and homogenisation, and the products and services are characterised by poor interactive experience, imperfect payment mechanisms and formal recommendation services. On the premise that the theory of the new business model has been validated by the mature platform Zhihu, we analyse the causes of the problems with the help of the elements of the new business model and propose a solution to the dilemma based on business model optimisation by combining the findings of e-commerce and marketing theories. The solution includes strategies focused on the value positioning and value claims of the business model, key business activities and

core competence resources, and customer relationship model. In terms of positioning, the value of the platform is positioned in the direction of knowledge services, so as to passively cater to customers' desires and actively guide their interests; in terms of core competency resources, the vertical specialisation of content and the enrichment of the long tail are used as grasping hands to grasp explicit customer needs and potential long-term customer demands; in terms of key business competencies, the focus is on improving and strengthening various mechanisms of the platform, including the quality governance mechanism of the platform's products, the pricing mechanism of the platform's products, and the feedback processing mechanism of the platform. In terms of key business capabilities, the platform will focus on improving and strengthening various mechanisms, including the platform's product quality governance mechanism, product pricing mechanism, platform feedback processing mechanism and the joint construction of property rights protection mechanisms with other platforms; at the customer relationship model level, the short-term passionate fan effect will be transformed into a long-term sense of identity and belonging to the community culture, and the emotional memory connection between users and the community will be strengthened. In short, only through continuous improvement at all levels can knowledge payment platforms achieve long-term sustainable and stable development.

(3) It provides a new perspective for the study of business model optimisation strategies. Based on the literature on business model optimisation strategies, this paper supplements the original theoretical research perspective of focusing on competition over cooperation, introduces the perspective of "value networks", and proposes a business model model based on value networks, combining the theoretical foundation of the original Lei business model. On this basis, the study takes the knowledge payment industry as a field of exploration, and takes the typical knowledge payment platform Zhihu as a case study to verify the strength of the new business model theory in explaining enterprise practice by revealing the key factors of the success of Zhihu's business model. The study finds that the new business model theory model better explains the essence of the business model of the Internet knowledge payment platform as a complete value co-creation closed-loop structure, and reveals the consistency between the underlying logic of Internet knowledge payment and traditional knowledge payment, which provides a new perspective for the solution of business model problems and the study of business model optimization strategies.

7.2 Research Limitations and Outlook

7.2.1 Limitations of the Research

(1) The case sample is not comprehensive enough. This paper studies business models and their optimisation strategies. In the course of the research, although the more mature Zhihu platform is used as the case study object, the consistency of the essential attributes of the business model of the knowledge payment platform with the underlying logic of traditional knowledge payment is verified. However, due to the limitation of space, a detailed study of other head platforms in the industry and coverage of the central and tail platforms in the industry are lacking, which will also be the direction of

the author's future research.

(2) The new research methodology still needs to be tested. This paper attempts to use the new business model model to analyse and solve the problems of the business model. In the process of research, it combines the experience marketing theory to elaborate on the selection behaviour of Internet users towards products, and tries to propose strategies to solve the problems of the business model from the level of customer thinking. As this method is a kind of experimental exploration for the solution of such problems, the subsequent analysis of user experience data and big data is needed to make the research method more convincing and to play a role of scientific and rigorous inspiration for the real solution of the problems.

7.2.2 Research Outlook

With the continuous upgrading of Internet technology, knowledge payment platforms have shown diversified development, giving rise to various kinds of goods in different forms. Compared with traditional knowledge payment, Internet knowledge payment is the general trend in the Internet information era. Knowledge payment not only solves the development dilemma of traditional portals relying on advertising for profit, but also addresses the inherent demand of online users for quality knowledge information. Even for the development of the industry, knowledge payment has better completed the commercial screening of quality knowledge platforms, breaking the trap of "bad money expelling good money" in the traditional knowledge payment industry, and driving the industry to develop steadily and well. In general, the business model of knowledge payment platforms has gradually matured, but this paper also finds that there are still many challenges and dilemmas behind the mature business model of platforms. In order to achieve a win-win outcome for platforms, content producers and partners, what is needed is not only a legitimate distribution of benefits between the platform and relevant stakeholders, but also the long-term high-quality operation of the platform's content and services. This means that the earlier fan economy business model, which relied on knowledgeable celebrities and traffic stars, can no longer support the long-term interests of platform development. If the platform is to be sustainable and maintain long-term profitability, it must face up to and solve the various content and service problems of the platform. It should be said that "content is king and experience is paramount" is the core of the knowledge payment industry, which means that platforms need to quietly work on user needs and create a value ecosystem that serves users well. At the same time, in order to ensure that the content and services of the platform can accurately meet the needs of users, the platform needs to pay more attention to the establishment and improvement of its governance structure. Only when platforms conceptualise and institutionalise high-quality content and attentive services, and truly implement them in all aspects of the platform, will they gain core competencies that are difficult to replicate and continue to make profits.

However, with the normalisation of the epidemic in recent years, more new characteristics have emerged in the development of knowledge payment platforms, with user online education, medical consultation and psychological counselling being the most notable, which also heralds a new

development space for the knowledge payment industry. The current knowledge payment industry has already seen an obvious head aggregation effect and long-tail effect, which undoubtedly indicates that knowledge payment will show greater economies of scale in the future, and behind the greater economies of scale is the merger and combination of companies. In addition, with the short videos of Jieyin and Racer's knowledge grabbing users' fragmented time and attention, there will be new changes in the text and voice based communication carriers of knowledge payment, which will be an important aspect of the subsequent research.

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Appendix

Statement of Ethics

What is the project title?

A study on the business model optimization strategy of knowledge payment platform: the example of Zhihu

Who is carrying out the project?

Mingqi Wei

What is the project about?

Designing questionnaires on Zhihu's internal operation model and the current state of internal operation, and conducting questionnaires on Zhihu's internal staff to collect corresponding data

Who is being asked to take part, and why?

Internet workers, including Zhihu employees and managers. The reason is that this article takes Zhihu as the research object

What will participants be asked to do?

A questionnaire was designed to survey Zhihu employees to obtain the results.

Take the form of in-depth interview with Zhihu management

What will happen to the information I provide?

The content of the questionnaire includes Zhihu's current situation and projects to be optimized

What will be the outputs or outcomes?

Provide a basis for the problems and suggestions of the subsequent business model of the paper