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Analysis of the Influencing Factors of Consumers' Purchase Intention of Online Knowledge Paid Products: The Case of China's "De Dao" Application

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Abstract

In recent years, China's mobile internet knowledge payment industry has developed rapidly. People's attitude and consumption concept towards high-quality paid knowledge have changed, and their willingness to pay for high-quality content has become stronger. China's knowledge paying users are increasing, and the industry market potential is huge. However, in the process of development, the knowledge payment platform has also encountered various problems in its development. For example, how to capture existing and potential users, what kind of network knowledge payment products users are willing to buy, and so on. In this paper, 410 valid questionnaires were collected based on consumer samples. Using the method of regression analysis, this paper empirically analyzes the influencing factors of consumers' purchase intention to buy knowledge paid products from the perspective of user perception. Taking perceived usefulness, perceived entertainment, perceived cost and technical characteristics as independent variables and purchase intention as dependent variables, a factor model affecting the purchase intention of knowledge paid products is designed. This paper proves that perceived usefulness, perceived entertainment, perceived cost and technical characteristics are positively correlated with purchase intention. Finally, this paper provides some reference suggestions for the development of knowledge payment platform represented by Dedao.

Keywords: Knowledge payment, Perceived value, Purchase intention

Introduction

In the information age, knowledge has become one of the important factors that determine the production and survival of human beings (McCalla, 2013). When basic needs such as "food, clothing, housing and transportation" (Maslow, 1943) is no longer the primary consideration of consumers, the improvement of self-awareness becomes the inevitable choice of consumption at present. More and more people like to find the knowledge and content they need and are interested in from the internet, which corresponds to the huge redundancy of information brought by the information technology revolution (Yang, 2019). Knowledge payment platform helps people to solve the demand of searching for core knowledge in the shortest time from the Internet full of massive knowledge, reduces the time of knowledge acquisition, and improves the efficiency and probability of knowledge reuse (Ying, 2019).

In the white paper on the development of China's knowledge payment industry 2017, knowledge payment is defined as knowledge producers' integration of relevant books, theoretical knowledge and information based on their own cognition. They systematically and structurally sort out the integrated knowledge and produce standardized paid products. Through the payment mechanism of knowledge payment platform, the products are delivered to users to meet their own needs, such as quality training, knowledge accumulation, skill improvement and community communication. Most knowledge payment products take audio as the carrier, and can use fragmented time to learn on mobile phones (Wang, 2018). The white paper defines the knowledge payment platform as a comprehensive knowledge payment platform in the mobile internet era, which uses the knowledge information gap between information producers and

consumers to package the knowledge information into products or services, develops the payment function, and establishes a separate plate and a first-class entrance for it.

According to the survey report of AI media consulting company in 2020, China's knowledge payment market will reach 39.2 billion yuan in 2020. In 2021, it is expected to reach 67.5 billion yuan and 477 million users. With the change of the competition environment, the market competition faced by enterprises is expanding in both breadth and depth. The concept of competition has gradually developed from profit oriented to customer oriented. For an enterprise, no matter big or small, customers are the groups that directly create benefits for the enterprise. How to obtain certain benefits from customers and maintain a long-term good relationship with customers, so as to increase the value of enterprise benefits (Li, 2013), is a headache for enterprises. With the development of the concept of "User-centered" (Norman & et al., 1986), customer resources have become one of the most important strategic resources of enterprises, and every customer resource is extremely important. The marketing strategy of any company largely depends on the behavior of consumers and how they make purchase decisions (Pelau, 2011).

For knowledge payment platform, there are many unfold questions, such as how to grasp the existing users and potential users, what kind of network knowledge payment products users are willing to buy, and so on. By analyzing the factors of users' intention to purchase knowledge payment products, we can find out the problems of the platform in stimulating the purchase of users, which has a strong practical reference value for the development of online knowledge payment platform.

Background

2016 is known as the first year of knowledge payment in China. From this year, online knowledge service platforms such as Zhihu, Dedao and Himalaya FM have successively launched knowledge payment products. According to the 2016 report on knowledge youth, the number of paying users increased rapidly to 50 million in 2016, and the overall economic scale of that year was about 10 billion yuan.

The research object of this paper is Dedao, one of the top 3 knowledge payment platforms launched in December 2015. Dedao's product positioning is to provide audio subscription courses, e-books and other knowledge products and services for users who want to improve themselves (workplace ability, learning ability and quality of life) through knowledge. Let them make effective use of fragmented time learning on mobile phones through this efficient knowledge service platform. Let users form learning habits and get effective knowledge and growth in a short time. In June 2016, the first paid column "Lixiang Business Internal Reference" was launched, with more than 3.5 million users in December of the same year. One year after the platform was launched, the revenue exceeded 100 million yuan. According to Dedao 2020 user data report, the cumulative number of registered users has reached nearly 24 million.

The rapid development of knowledge payment platform and its huge economic value have caused a lot of theoretical research. Most of them focus on the current situation of platform development and business model, such as the rationality of content charging (Lambrecht, 2017), the profit model of knowledge economy and the payment model of platform (Jiang, 2017; Zhang, & et al., 2017), research on the future development trend of content payment (Wen, 2017; Gu, 2017), research on the impact of knowledge payment platform on content marketing (Wang, 2021).

In terms of user behavior research, Wu and Sun (2018) found that personal knowledge management needs, performance expectations, perceived interest and social influence positively affect user behavior by analyzing the user characteristics of online knowledge payment platforms. Zhang et al. (2017) found that individual demand (57.77 %) and information quality (42.23 %) are 2 important factors affecting users' use of knowledge payment platform products, of which individual demand factor accounts for a higher proportion

Dou (2004) found that perceived risk and perceived profit are important factors influencing users' willingness to pay for content. Lopes and Galletta (2006) verified that the expected benefits of paid content are the main factors influencing users' purchase intention by investigating students' willingness to use paid content.

Sun and Fu (2018) found that for consumers, the price of knowledge is usually regarded as an important indicator of buyer's cost. This means that for most ordinary consumers, the price of knowledge

products affects the purchase decision. Zhang and Zhang (2019) believes that customers with different professional knowledge have different customer satisfaction with knowledge price and historical knowledge consumption transaction. Customers with professional knowledge background are less sensitive to price, and new customers without professional background are more likely to be affected by price fluctuation. This means that in the knowledge payment platform with higher knowledge specialization, customers with professional knowledge background are more likely to have consumption behavior, and they don't care much about the price of knowledge products.

Davenport and Prusak (1998) found that the reason why knowledge can be traded or shared in the knowledge market is that all participants believe that they can obtain utility in it. They stressed that trust is the core of knowledge exchange. By integrating trust theory and social identity theory, Su et al. (2019) found that consumers' recognition and trust of knowledge platform significantly positively affect consumers' purchase intention. Gremler et al. (2001) proved that trust plays a positive role in recommendation. Customer trust has a positive impact on repurchase intention and word-of-mouth. The more customers trust a company, the more likely they are to recommend it to others. Xie and Wu (2019) believe that trust plays a dominant role in various factors affecting consumers' online knowledge payment behavior, and there is a strong star effect in online knowledge payment.

The existing research literature on knowledge payment platform mostly focuses on the platform model and consumer behavior. Most of the selected objects are the whole knowledge payment platform industry or Zhihu platform and Himalayan platform with stronger perceived interest and more users. There are few studies to explore the user payment tendency of Dedao platform. Consumer behavior studies how a person decides to buy a specific product instead of other products, and what are the potential factors that shape this behavior (Vo & Vo, 2018). Mullet (1990) believes that the attitude of consumers to the purchased goods under the influence of different factors is the purchase intention. Purchase intention is the subjective tendency of consumers to choose goods, and also can directly affect the consumer behavior. It can be seen that purchase intention is a prerequisite for triggering subsequent purchase behavior. How to grasp the existing and potential users of network knowledge payment products, and what kind of network knowledge payment products users are willing to buy, should start with the study of users' purchase intention. From the perspective of users, it is valuable to analyze the problems and Improvement Countermeasures in the hot field of network knowledge payment.

Problem statement

This study aims to explore consumers' purchase intention on Dedao platform, and to identify the influencing factors of consumers' purchase tendency for knowledge payment products provided on Dedao platform.

Objectives and aims

The purpose of this study is to explore consumers' purchase intention of knowledge payment products on Dedao platform, and to deeply understand the factors influencing the purchase intention.

With the large-scale application of mobile payment technology, the purchase of mobile terminal has become the normal purchase behavior of people's life, and the mobile internet has become an important position for consumers to purchase. The formation and growth of knowledge payment products has become an important consumption field in the mobile Internet environment, and it is a new e-commerce model with strategic significance. This study will help to improve the consumer consumption theory in the mobile Internet link, as well as the related theory of knowledge payment product purchase intention research.

The development of online knowledge payment products largely depends on the change of user attitudes. The analysis of online knowledge payment products based on users' purchase intention can deeply understand the consumption motivation, consumption demand and consumption behavior of users. By understanding users' knowledge payment concept and influencing factors, can grasp users' preferences for online knowledge payment products. Combined with the user's consumption attitude and consumption characteristics, can analyze the current problems that affect the purchase intention of knowledge payment

products from the perspective of users and put forward countermeasures to improve the platform and products.

Literature review

Overview of knowledge payment research

Knowledge payment

Knowledge payment is a new economic phenomenon rising in recent years. Knowledge payment is to turn knowledge into products or services in order to realize business value. Knowledge payment is conducive to people's efficient screening of information, and it also encourages the production of high-quality content. Knowledge payment can also be defined as the consumer behavior that users purchase knowledge products to meet their cognitive improvement and self needs (Yang, 2019). Zou and Luo (2017) believe that knowledge payment is an integrated version of knowledge sharing and content payment. Among them, knowledge sharing is a form of sharing communication, which integrates the knowledge, skills and intellectual resources in the professional field, and spreads to the public through a specific way. This process can be charged or free. Content payment is a kind of business model, which can only be read and understood after paying a specific fee.

According to the survey results of penguin think tank in August 2016, people tend to pay for 3 types of content: Skills, advice and quality. Li (2016) has a similar view. He divides knowledge into 3 categories according to users' consumption preferences: One is skill knowledge, that is, practical knowledge that users can learn directly and point to users' short-term practice. The second type is experiential knowledge, which provides users with mid-term decision-making through consultation and suggestions. The third type is intellectual knowledge, which refers to the knowledge that users need to understand slowly and digest and absorb independently according to their own reality. It usually points to the long-term self-growth of users. He believes that in each specific product, there are 3 types of knowledge components, but 1 type is the main one. Fang (2017) believes that "what users need" may be more important than strict classification of information and knowledge.

There is no unified understanding of the types of online knowledge payment from the above research. In fact, the strict classification of knowledge is not important. It is important to recognize the needs of users and the characteristics of this knowledge. Jennifer (2008) found that online content products have significant value, background, repeatability, additivity, interactivity, homogeneity, transportability, technicality and other characteristics. Hanson (2000) believes that the obvious characteristics of online content products are high homogeneity and high experience. Ren and Yue (2020) believes that the knowledge in online knowledge payment has 3 characteristics: One is the high degree of scenario. They believe that people are increasingly willing to pay for solutions for specific scenarios. Therefore, the key to the future development of major knowledge payment platforms is to find out the main scene of the life of users or potential users, and take it as the entry point. Second, it is highly empirical. Knowledge producers accurately link their own experience with the main scene of users' life. In the era of user dominated market, who meets the basic needs and experience of users, who has the main scene of users, who has the market. In the future, the competition for scenarios may need to test the understanding of users' deep needs by major knowledge platforms. Third, it is valuable. Valueless knowledge and knowledge that can't meet the needs of users can't be used as the deliverable of buyers and sellers in knowledge market.

Knowledge payment platform

From the existing research, we can find that knowledge sharing and acquisition can be realized through 2 ways or forms: Knowledge market and community (social interaction). The concept of knowledge market first appeared in the work of Davenport and Prusak (1998). They use knowledge market to describe the phenomenon of knowledge exchange and flow within or between organizations. They believe that knowledge will be operated by market forces, just as there are buyers and sellers in the market. In an organization, the existence of knowledge market is just like that of physical goods. In the knowledge market, the reason why knowledge can be traded (shared) is that all participants believe that they can obtain utility in it. With the development of modern information technology, the cost of acquiring and sharing

knowledge through knowledge market is lower, and the existence of knowledge market is more common (Quinn, 1992). DeSouza et al. (2005) defined knowledge market as an environment in which buyers and sellers can trade expertise within a certain range of pricing and trading rules. Natalicchio et al. (2014) put forward the concept of general knowledge market. They believe that this is a virtual market, which promotes the display, search and transaction of knowledge assets with potential economic value between individuals or organizations. In such a market, there are 3 core units: Knowledge, knowledge owner and knowledge acquisitor.

For the field of online knowledge payment, Ren et al. (2020) thinks that it is an online knowledge market, which is a general knowledge market mediated by internet knowledge platform. The transaction subject includes knowledge producer, knowledge consumer (user) and knowledge platform. Among them, knowledge payment platform is the connector and coordinator of knowledge producers and users. The object of transaction is knowledge, which has the characteristics of high scene, experience and value. Yang (2019) described knowledge payment platform as an online service platform connecting knowledge payment products and product buyers, which can realize content presentation, content payment, content dissemination, user management, evaluation system, etc.

China's knowledge payment industry can be roughly divided into 3 stages: Exploration period (2012 - 2014), early stage (2014 - 2016) and high-speed development period (2016 to now). Before 2014, education industry, consulting industry and publishing industry provided a solid foundation for the birth of knowledge payment products. The popularity of the Internet provides the soil for the development of knowledge payment (Wang, 2018).

From 2014 to 2016, mobile payment technology gradually matured and popularized, and users began to get used to online payment. A large amount of capital has brought development opportunities and technical support for the knowledge payment industry. Since 2016, with the rapid development of the knowledge payment industry, a large number of knowledge payment platforms have sprung up to compete. The scale of users has increased year by year. China's intellectual property protection policy has further deepened the value of content. The field of knowledge payment has ushered in a favorable situation. Dedao platform launched audio subscription course products, attracted a lot of popularity. Zhihu platform has a large fan base. Himalaya platform launched a number of paid subscription products, see **Table 1**. These platforms have shown great potential and development momentum. Knowledge payment has entered into the membership mode, and the enthusiasm of content producers for content creation and knowledge realization is unprecedented. While building personal brand and forming fans' foundation, more and more emphasis is put on the value-added of knowledge and skills and the sense of user acquisition. Mature business model began to appear, the market entered the stage of rapid development.

Table 1 Comparative analysis of representative platforms of knowledge payment.

Category	Himalaya	Zhihu	Dedao
Online time of payment mechanism	June 2016	May 2016	December 2015
Platform positioning and mode	Integrated audio sharing platform	Comprehensive knowledge interactive community	Rigorous professional knowledge service platform
Paid column	16 categories of paid top-quality products and 10,000 paid courses	Zhihu live, paid consulting, appreciation, e-book	Subscribe to columns, excellent courses, listen to books every day, e-books
Pricing model	Paid subscription, 188 yuan per year	Dynamic pricing of word production content by content producers	328 yuan per year for listening books members and 178 yuan per year for e-book members. Column courses are priced according to the number of sections, generally between 90 - 298 yuan.

Category	Himalaya	Zhihu	Dedao
Content production	CO production + anchor stay	Professional organization + celebrity + user made	The team invited celebrities to co-produce
Service form	On the basis of free to launch paid boutique zone	On the basis of free communication and sharing, it provides consultation, course learning and other paid services	Knowledge news is free. Pay for excellent services such as columns, courses and audio e-books

From the comparative analysis of the 3 domestic knowledge payment platforms, there are differences in the positioning mode, paid content and paid columns of the platforms. On the whole, these platforms are relying on traffic to provide users with targeted paid subscription knowledge service content, focusing on quality audio courses.

In terms of industry development, according to the research and analysis report on the operation and development of China's knowledge payment industry and user behavior in 2020, the product homogeneity among platforms is becoming more and more obvious. The product has the characteristics of popularization and wide coverage, but it cannot meet the needs of users' deep learning, and it is difficult to improve the user stickiness. Therefore, verticality and differentiation are becoming the development trend in the field of knowledge payment. Popular platforms and products are gradually transformed to professional segmentation, and the scene of knowledge payment is constantly expanding. In addition, a large number of knowledge service platforms focusing on IT, workplace, finance, health and other hot fields have emerged in the market, aiming at accurately solving the core knowledge needs of users.

In order to achieve sustainable development, the future online knowledge payment platform also needs to understand users' behavior and attitude, and understand users' psychological characteristics (Li, 2018), especially the payment intention, satisfaction and continuous payment intention of users, and the cultivation of users' learning habits (Yan et al., 2019).

Dedao platform

Dedao is a paid platform launched by the logic thinking team, which was launched in December 2015. Initially, it mainly pushed knowledge news, providing e-books, audio books and other services. In May 2016, the launch of the paid content "Lixiang business reference" represented that Dedao platform really began to explore the field of knowledge payment. Now the platform has 6 main services: Listening to a book every day, excellent class, e-book, brocade bag, live broadcast and online shopping mall.

In terms of products, Dedao focuses on the production of professional content, which is more learning and systematic. The choice of paid products has common topics, such as art, culture, finance, science and technology, workplace, parent-child, education and so on. Through the team carefully polished to meet the "content value" conditions. The platform invites experts, scholars and leading figures in various fields of the industry to settle in the platform to produce knowledge payment products in relevant fields, such as quality courses, to provide knowledge services to the public and realize knowledge realization. According to the special analysis of China's Pan knowledge payment market, 48 % of the respondents are willing to pay for high-quality content.

Professionals are the core pillar of Dedao, and their long-term output of high-quality paid content is the cornerstone of the platform's sustainable development. Most of them are key opinion leaders in the vertical field, coming from science and technology circle, investment circle, university scholars or professors, etc. The same characteristic of them is that they are professional and authoritative in their related fields, and some of them often have a large number of fans. They hope that there is a better channel to make use of their professional knowledge, service and influence, not only to spread their ideas to the public, but also to get more rewards.

There are 4 reasons why Dedao is so popular in China (Xie & Zhou, 2017). One is the brand endorsement of the founder. The founder of Dedao is Luo Zhenyu, a well-known TV host and producer in China. His talk show 'logical thinking' began to broadcast on major domestic video platforms in 2012, with a total demand of more than 1 billion people. Luo Zhenyu created the image orientation of "low-key, interesting and informative", and created a "charming personality" with his own attitude and action. So when Dedao was first launched, most of its users came from the founder's fans. The second is accurate user positioning. According to the product analysis report of Dedao app, at present, the main user groups of Dedao are 24 - 40 years old with college degree or above. The main characteristics of this age group are high career pressure and urgent desire for learning knowledge and self-growth. They are usually busy with their work and have no time to study. They are typical users of products. The advantage of audio course products is that they can use fragmented time to listen repeatedly, have no requirement for time consistency, and avoid eye fatigue. Dedao's products well meet the needs of the main consumer groups. Third, strictly control the authoritative and high-quality content. The content providers of all columns on the platform are top figures in the field, with professionalism and authority. Fourth, digital marketing, using the platform internal community forum and other social platforms for word-of-mouth marketing. The platform uses reading notes, learning plans, user medals, credits and other ways to gradually increase users' sense of learning achievement and encourage users to share word-of-mouth. The user stickiness is improved by using precise algorithm push and community live broadcast sharing.

Purchase intention

On the major knowledge payment platforms, why are users willing to pay to become trial users? Users' payment motivation, intention and behavior have always been the focus of scholars and practitioners.

Purchase intention refers to the probability of consumers' voluntary purchase behavior. Mullet (1990) believes that the attitude of consumers to the purchased goods under the influence of different factors is the purchase intention. It is not only the subjective tendency of consumers to choose goods, but also can directly affect consumers' consumption behavior. Dodds et al. (1991) believes that when consumers consume a certain product, the subjective possibility of consumption is purchase intention.

Purchase intention will change. Hawkins et al. (2010) defined intention as a variable, which stimulates and promotes consumers to purchase products or services. Kim and Thorndike (2000) pointed out that purchase intention is a tool to measure consumers' purchase behavior. In addition, Morwitz and Schmittlein (1992) show that purchase intention can be used to predict consumers' purchase decision behavior. Product and brand awareness also play a role in the formation of purchase intention (Park et al., 2007). Bourdeau (2002) pointed out that the Internet brings pleasure to many internet users and makes them feel valuable. This pleasant sense of value may further affect their online purchase of goods they need. Kim (2009) found that purchase intention will be affected by 2 kinds of perceived value: return and risk. The greater the perceived value, the stronger the purchase intention.

This study reviews the previous research on users' purchase intention of online knowledge payment products, and sorts out the factors influencing users' purchase intention. The results are shown in **Table 2**.

Table 2 The main factors that affect users' intention to purchase knowledge payment products.

Main influencing factors and influencing direction	Author
Purpose of online content, brand awareness of online content website, user's experience of online payment with credit card (+). Free mentality (−)	Dou (2004)
Perceived convenience, necessity, added value, quality of service and usage frequency of a given service (+). Perceived injustice (−)	Wang et al. (2005) Zhou and Tan (2017)
Impact of credibility, interactivity, personalization and page navigation (+). Perceived cost (−)	Wolk and Theysohn (2007)

Main influencing factors and influencing direction	Author
Perceived usefulness, perceived pleasure (+)	Kim et al. (2009) Wang (2018); Song (2018)
Perceived benefits, subjective norms, perceived behavior control (+). Free mentality, perceived cost (−)	Lin et al. (2013)
Network externality and social capital (+)	Lin and Liu (2014)
User income and education, age and gender (+)	Punj (2015)
Utility value and entertainment value (+)	Zhang et al. (2017)
Reputation, competence and integrity of knowledge contributors (+)	Zhao et al. (2017)
Perceived usefulness, perceived ease of use (+)	Peng (2018)
Individual needs, individual cognition, information quality, subjective norms, convenience, substitutes and economic factors	Zhang et al. (2017)
Experience factors (including professionalism, interest, convenience and subjective norms), demand factors (including external demand and internal demand) (+)	Du and Xu (2019) Zhao et al. (2018)
The dimensions of perceived value (quality value, social value, price value and income value) (+)	Li et al. (2017) Zhou et al. (2017) Zhang et al. (2019) Chen et al. (2019)

The results show that the sense of value, trust, personal characteristics of users (including gender, age, education, income, etc.), cost and convenience brought by brands and products are all factors affecting purchase intention. The research object involves online music users, e-book users and various online payment and online knowledge payment users. However, whether these factors are applicable to users of Dedao online knowledge payment platform needs further verification.

User value acceptance model

Kim (2009) integrated customer perceived value theory (CPV) and Technology Acceptance Model (TAM) to establish user value acceptance model (VAM), as shown in **Figure 1**, when studying the use of mobile internet based on perceived value. The results show that various factors affect purchase intention through perceived value, which directly affects consumers' willingness to use mobile Internet.

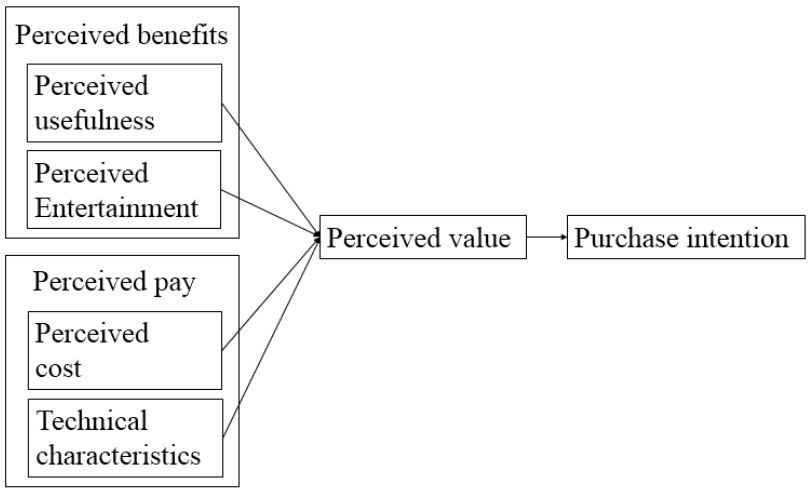

Figure 1 User value acceptance model.

Among the independent variables, perceived value is the core variable of the model. In the model, perceived benefit and perceived pay together constitute perceived value. Perceived benefits include perceived usefulness and perceived entertainment. Perceived usefulness refers to whether consumers feel that using this commodity or service has an effect on 1 aspect of themselves. Perceived entertainment refers to whether consumers experience fun and pleasure in the whole process. Perceived pay refers to the judgment of the cost that consumers need to pay, including perceived cost (economic cost) and technical characteristics (non-economic cost). Perceived cost refers to the perceived economic cost; technical characteristics are the feelings brought to consumers by the technology used by consumers in the consumption process, including the perceived ease of use, reliability and so on.

Research framework

According to the relevant literature affecting users' purchase intention and the user value acceptance model, the variable structure affecting users' purchase behavior of online knowledge payment products can be summarized.

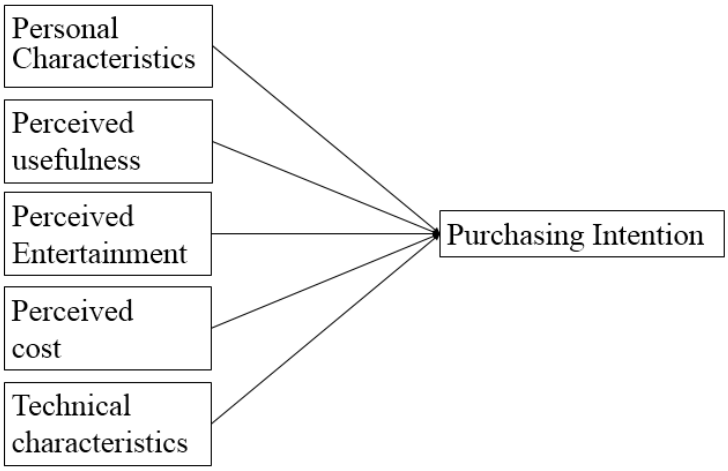

Figure 2 Research framework.

Hypotheses

Perceived usefulness in this study refers to the extent to which users believe that buying and learning knowledge paid products can help them improve their work efficiency and cognitive level. When studying the impact of perceived value on consumers' mobile shopping intention, Liu and Tang (2015) confirmed that "perceived usefulness has a significant positive impact on perceived value". Huang (2017) proved that "perceived usefulness has a positive impact on attitude and attitude has a positive impact on purchase intention" when studying online community knowledge services. Based on the above, this study hypothesizes that;

H1: Consumers' perceived usefulness of knowledge paid products has a positive impact on purchase intention.

Perceived entertainment refers to the subjective feelings and emotions of users when consumers buy knowledge paid products. It is the entertainment state perceived by consumers. Lee (2005) studied the learning media of the Internet and found that perceived entertainment can have a positive effect on attitude. Huang (2017) proved that perceived entertainment has a positive effect on attitude and attitude has a positive effect on purchase intention when studying online community knowledge services. Based on the above, this study proposes that:

H2: Consumers' perceived entertainment of knowledge paid products has a positive impact on purchase intention.

Perceived cost is the psychological feeling of consumers about the price of consumer goods. Many scholars have proved that perceived cost has a direct impact on purchase intention. Dodds believes that the reason why consumers can't face the real value of goods is likely to be caused by unreasonable prices. Swatman and others believe that an important factor why online consumers can consume is a reasonable price. Based on the above, the research assumptions are as follows;

H3: Consumers' perceived cost of knowledge paid products has a positive impact on purchase intention.

Technical characteristics refer to the technical cost involved in the process of using knowledge payment products. Specifically, it includes the convenience, ease of use, reliability and efficiency of operation. When studying the impact of perceived value on consumers' mobile shopping intention, Liu and Tang (2015) confirmed that perceived ease of use has a significant positive impact on perceived value, and perceived ease of use belongs to a part of the technical characteristics of this paper. Wang (2017) confirmed that in the process of we media information content effect, perceived ease of use has a positive impact on perceived usefulness and information content consumption intention.

H4: Consumers' perception of the technical characteristics of knowledge paid products has a positive impact on purchase intention.

Methodology

Research design

This paper collected data from users who have purchased knowledge payment products on Dedao platform as the research object to study consumers' purchase intention. Through the literature retrieval and reading of knowledge-based payment products and consumers' purchase intention, this paper analyzed the factors affecting consumers' purchase intention by using correlation and regression. Find out the shortcomings of previous studies, and determine the research perspective and entry point of this paper.

This paper uses empirical research and quantitative research method. Collect the required basic data in the form of questionnaire survey. The research objects are users who have voluntarily purchased knowledge payment products and learned on Dedao platform through mobile phones. The questionnaire refers to the questionnaire of Wang (2018); Kim (2009); Song (2018) and others. The relatively mature items with high confidence in previous studies are selected for reference, and the situational modification is carried out in combination with the research object of this paper

There are 24 questions in the questionnaire, and the first 8 questions are the basic information of the respondents. The last 16 questions are related to variables. The 4 independent variables include perceived usefulness, entertainment, cost and technology. Each variable selects 3 questions. One dependent variable, purchase intention, selected 4 questions.

Questionnaires (including scenarios and scales) were distributed through the Internet and wechat circle of friends to collect data. The title options of the scale are measured by Likert's 5-point scale, in which 1 means "Totally disagree" and 5 means "Totally agree". The larger the number, the higher the degree of agreement.

Table 3 Cronbach alpha (N = 410).

Variable	Number of items	Corrected Item-Total Correlation (CITC)	Cronbach α
Perceived usefulness	3	0.914	
Perceived entertainment	3	0.915	
Perceived cost	3	0.915	0.972
Technical characteristics	3	0.923	
Purchase intention	4	0.927	

According to the test results in **Table 3**, the Cronbach's α value of perceived usefulness is 0.914, with good reliability. The Cronbach's α value of perceived entertainment is 0.915 and the reliability is good. The Cronbach's α value of perceived cost is 0.915, with good reliability. The technical Cronbach's α value is 0.923, and the reliability is good. The Cronbach's α value of purchase intention is 0.927, with good reliability. The overall Cronbach's α value of the scale is 0.972, and the reliability is good, indicating that the internal consistency of each variable of the questionnaire is good.

Scale design

The variables involved in this study mainly include 4 independent variables: Perceived usefulness, entertainment, cost and technology, as well as 1 dependent variable, purchase intention. The final scale is obtained by referring to the relatively mature scale and according to the concept definition of variables in this study. The variables and corresponding measurement questions are shown in the table below.

Table 4 Specific questions of the questionnaire and corresponding reference sources.

Variable	Code	Measurement item	Indicator source
Perceived usefulness	U1	Using knowledge payment products makes me complete tasks faster.	Kim (2009); Wang (2018)
	U2	Using knowledge payment products enhances my performance in the task.	
	U3	Using knowledge payment products has broadened my horizons.	
Perceived Entertainment	E1	The paid content of knowledge purchased is very interesting.	Song (2018); Wang (2018)
	E2	Learning knowledge makes me happy.	
	E3	Make my life and study more interesting by using knowledge products.	
Perceived cost	C1	The pricing of knowledge payment products is particularly high, which is difficult for me to accept.	Song (2018)
	C2	Compared with free knowledge, I think knowledge paid products are a waste of money.	Wang (2005); Song (2018)
	C3	Knowledge payment products do not shorten the time and energy for me to master information and knowledge.	
Technical characteristics	T1	I think it is very convenient to use the knowledge payment platform.	Kim (2009); Wang (2018)
	T2	It's very easy to find the knowledge paid products I want.	
	T3	The platform for providing knowledge payment products is reliable and stable.	
Purchase intention	PI1	I think buying paid knowledge is a wise choice.	Song,2018
	PI2	In the future, I will maintain the frequency of purchasing paid knowledge and even increase it.	
	PI3	I will buy more kinds of knowledge payment products in the future.	
	PI4	I will recommend some knowledge payment products to my friends.	

Data analysis

Collection of sample data

The survey object of this study is Dedao platform users who have paid. The questionnaire was distributed and collected from October 1 to October 27, 2021. A total of 430 questionnaires were collected through the questionnaire star website (https://www.wjx.cn). After excluding the invalid questionnaires

with the same scores and obvious mutually exclusive answers, the final valid questionnaires were 410, and the qualified rate of the samples was 95.35 %.

Descriptive statistics of variables

In this study, SPSS 21.0 was used to conduct descriptive statistical analysis on the gender, age and occupation of the sample, as shown in **Table 5**.

Table 5 Demographic data.

Demographic Variable (N = 410)	**Categories**	**Frequency**	**Percent (%)**
Gender	Male	189	46.10
	Female	221	53.90
Age	Less than 21 years	37	9.02
	21 - 30 years	129	31.46
	31 - 40 years	87	21.22
	41 - 50 years	96	23.41
	51 - 60 years	45	10.98
	More than 61 years	16	3.90
Career	Student in school	80	19.51
	Enterprise employees	209	50.98
	Civil servants or employees of public institution	74	18.05
	Individual industrialists and businessmen	27	11.46
	Other		
Education level	High school degree or below	26	6.34
	College degree	156	38.05
	Bachelor degree	197	48.05
	Master's degree or above	31	7.56
Monthly income (including living expenses given by parent) (Unit: Yuan)	≤ 5,000	173	42.20
	5,001 - 10,000	128	31.22
	10,001 - 20,000	69	16.83
	≥ 21,000	40	9.76
Type of paid knowledge purchased	Culture	145	35.37
	Skill	220	53.66
	Mother and child/ parent-child	222	54.15
	Business/ finance	208	50.73
	Career related	136	33.17
	Art	47	11.46
	Healthy	64	15.61
	Entertainment	18	4.39
	Others	16	3.90
Paid content from purchased	Paid audio (courses, lectures, columns)	183	44.63
	Listening to books	235	57.32
	E-books	237	57.80
	Wise counsel	178	43.41
	Training camp	119	29.02
	Paper published books	74	18.05
	Others		
Why start using Dedao	Knowledge anxiety from oneself	158	38.54
	Fan of a lecturer or columnist	231	56.34
	See a lot of praise from the network evaluation	224	69.51
	Recommended by people who have important influence (such as leaders, superiors, teachers, classmates, family, etc.)	183	44.63

	Many people around are using it	139	33.9
	Advertisement	73	17.8
	Others		

1) In terms of gender, the proportion of female samples is relatively large, accounting for 53.90 %, and that of male samples is 46.10 %.

2) In terms of age distribution, the age of most samples is between 21 and 30, accounting for 31.46 %, followed by 41 - 50 years old, accounting for 23.41 %. 31 - 40 years old accounted for 21.22 %.

3) In terms of occupational types, enterprise employees are the most, accounting for 50.98 %, followed by students, accounting for 19.51 %.

4) In terms of education level, most of the samples have bachelor's degree, accounting for 48.05 %, followed by college degree, accounting for 38.05 %.

5) In terms of monthly income, the proportion of less than 5,000 yuan is the most, accounting for 42.20 %; 5,001 - 10,000 yuan, accounting for 31.22 %

5) In terms of the types of products purchased, the purchase rates of mother, child, parent, skill, business and finance are all high, 54.15, 53.66 and 50.73 %, respectively.

6) In terms of product form, 57.80 % chose e-books and 57.32 % bought listening to books.

7) As for why Dedao is used, the number of people who choose to use the platform is more affected by network praise, which is 59.51 %, followed by 56.34 % of users because of the attraction of a columnist.

Correlation analysis

Correlation analysis is a commonly used statistical analysis method to measure the closeness of different variables. In this study, Pearson correlation coefficient was used to measure the correlation of variables. The greater the absolute value of the correlation coefficient, the stronger the correlation. The smaller the absolute value, the weaker the correlation. If the correlation coefficient is positive, it means that the change direction is the same. If the correlation coefficient is negative, it means that the change direction is opposite. In this study, SPSS 21.0 was used to analyze the correlation between variables. The results are shown in **Table 6**.

Table 6 Pearson correlation (N = 410).

	Mean	**Std. Deviation**	**Perceived usefulness**	**Perceived entertainment**	**Perceived cost**	**Technical characteristics**	**Purchase intention**
Perceived usefulness	3.821	1.108	1				
Perceived entertainment	3.816	1.091	0.862**	1			
Perceived cost	3.825	1.119	0.869**	0.861**	1		
Technical characteristics	3.849	1.131	0.877**	0.878**	0.873**	1	
Purchase intention	3.816	1.099	0.873**	0.884**	0.882**	0.882**	1

*$p < 0.05$ **$p < 0.01$

All the 4 items of perceived usefulness and perceived entertainment, perceived cost, technical characteristics and purchase intention are significant. The correlation coefficient values are 0.862, 0.869, 0.877 and 0.873, respectively, and the correlation coefficient values are greater than 0, which means that there is a positive correlation between the 4 items.

Regression analysis

The linear regression analysis was carried out by taking personal characteristics, perceived usefulness, perceived entertainment, perceived cost and technical characteristics as independent variables and purchase intention as dependent variables. As can be seen from **Table 7**, the model formula is: Purchase intention = −0.387 + 1.132*Personal characteristics + 0.172*Perceived usefulness + 0.281*Perceived Entertainment + 0.247*Perceived cost + 0.199*Technical characteristics. The R-square value of the model is 0.865, which means that 4 independent variables can explain 86.5 % of the change of purchase intention. During the F-test of the model, it is found that the model passes the F-test (F = 518.307, $p = 0.000 < 0.05$), that is, at least one of the 4 independent variables will affect the purchase intention.

Table 7 Regression analysis.

	Unstandardized coefficients		Standardized coefficients	t	*p*	VIF	R^2	Adj R^2	F
	B	Std. Error	Beta						
Constant	−0.387	0.146	-	−2.657	0.008**	-	0.865	0.863	F(5,404) = 518.307, $p = 0.000$
Personal characteristics	1.132	0.276	0.099	4.107	0.000**	1.740			
Perceived usefulness	0.172	0.044	0.173	3.917	0.000**	5.866			
Perceived entertainment	0.281	0.044	0.279	6.415	0.000**	5.650			
Perceived cost	0.247	0.043	0.251	5.726	0.000**	5.765			
Technical characteristics	0.199	0.045	0.205	4.408	0.000**	6.453			

Dependent variable: Purchase intention
D-W: 2.058
*$p < 0.05$ **$p < 0.01$

Table 8 ANOVA.

	Sum of squares	df	Mean square	F	*p*-value
Regression	427.027	5	85.405	518.307	0
Residual	66.570	404	0.165		
Total	493.597	409			

Specific analysis shows that;

The regression coefficient of personal characteristics is 1.132 (t = 4.107, $p = 0.000 < 0.01$), which means that personal characteristics will have a significant positive impact on purchase intention.

The regression coefficient of satisfactory use is 0.172 (t = 3.917, $p = 0.000 < 0.01$), which means that satisfactory use will have a significant positive impact on purchase intention.

The value of regression coefficient of persevered entertainment is 0.281 (t = 6.415, $p = 0.000 < 0.01$), which means that persevered entertainment will have a significant positive impact on purchase intention.

The regression coefficient value of perceived cost is 0.247 (t = 5.726, $p = 0.000 < 0.01$), which means that perceived cost will have a significant positive impact on purchase intention.

The regression coefficient of technical characteristics is 0.199 (t = 4.408, $p = 0.000 < 0.01$), which means that technical characteristics will have a significant positive impact on purchase intention.

Through summary and analysis, it can be seen that personal characteristics, perceived usefulness, perceived entertainment, perceived cost and technical characteristics will have a significant positive impact on purchase intention.

Table 9 Heteroscedasticity test results.

White test		BP test	
χ^2	p	χ^2	p
24.303	0.229	7.541	0.183

It can be seen from the above table that White test and BP test are used for heteroscedasticity. The original hypothesis is that there is no Heteroscedasticity in the model. The above table shows that both tests accept the original hypothesis ($p > 0.05$), indicating that there is no Heteroscedasticity in the model.

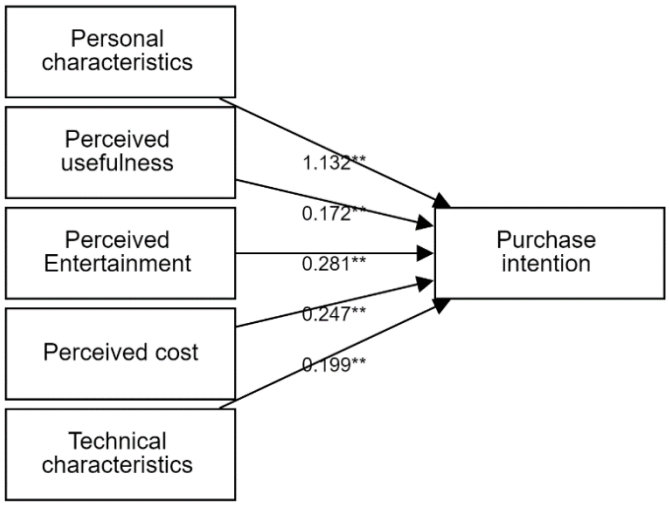

Figure 3 Model results.

Results and discussion

The summary and analysis shows that perceived usefulness, perceived entertainment, perceived cost and technical characteristics will have a significant positive impact on purchase intention.

The summary of hypothesis test results is shown in **Table 10**

Table 10 Summary of Hypotheses test.

No.	Hypothetical content	Results
H1	Consumers' perceived usefulness of knowledge paid products has a positive impact on purchase intention.	Hypothesis test passed
H2	Consumers' perceived entertainment of knowledge paid products has a positive impact on purchase intention.	Hypothesis test passed
H3	Consumers' perceived cost of knowledge paid products has a positive impact on purchase intention.	Hypothesis test passed
H4	Consumers' perception of the technical characteristics of knowledge paid products has a positive impact on purchase intention.	Hypothesis test passed

Conclusions

Usefulness, entertainment, cost and technology are positively affecting users' continuous purchase intention. Usefulness is the user's evaluation of product quality, reflects the utilitarian function and practical value of the product, and is a very important driving factor affecting the user's willingness to continue to use. More and more knowledge payment platforms begin to pay attention to the in-depth mining of knowledge and the creation of individual knowledge system, especially the platform represented by Dedao, which has gone deep into the development of tail knowledge and user accumulation. Various types of knowledge products fully meet the diversified and situational knowledge acquisition needs of users. Dedao organically combines the usefulness and interest of knowledge, innovates the way of knowledge acquisition, and has made good achievements.

Entertainment includes the interest of knowledge products and the pleasant experience brought to users. Users' enjoyment and sense of achievement in the learning process is also one of the important driving factors of continuous use intention.

Perceived cost includes monetary cost and non-monetary cost. It is consumers' perception of the total cost of knowledge products, such as money cost, time cost, energy cost and physical cost. Under the reasonable pricing system, consumers are less sensitive to monetary costs and more sensitive to non-monetary costs.

The technicality shows the user's overall service evaluation of the knowledge platform. The technical level is increasingly becoming the key to whether online users are willing to continue to use and purchase. Whether users are out of their own use needs or users' horizontal comparison when using other platforms, they put forward higher requirements for the operation efficiency of online knowledge payment platform. Especially in the aspects of convenience, safety, stability, aesthetics, timeliness of response, etc. It can be said that technical indicators are becoming the threshold elements of competition, especially the building based on the ease of use of the platform will become the key to attract and retain users.

Countermeasures and suggestions

Combined with the relevant results of this empirical study, this paper puts forward the following suggestions on how to comprehensively improve the user stickiness and repurchase rate of online knowledge payment platform products represented by Dedao;

1) At present, building a user value chain is the top priority of the operation of online knowledge payment platform. Online knowledge payment platform should build a free interactive community that can retain users for a long time on the basis of expanding user recognition and improving the single payment rate of users, so as to meet the needs of users' psychological, social and self-worth realization.

According to the needs of users' individual situational knowledge scenarios, create in-depth integrated knowledge absorption scenarios for them. On the basis of meeting their individual rigid needs, continuously improve users' consumption experience and carry out ecological integrated layout for users' lifelong learning. With the in-depth development of the knowledge payment industry, there are fewer and fewer "early adopters". More users are eager to subdivide the field of knowledge based on the individual's demand for in-depth learning. Users have higher and higher requirements for knowledge acquisition experience and knowledge acquisition results. This poses a great challenge to the future content production of online knowledge payment platform. Therefore, the knowledge payment platform needs to innovate the form and content while ensuring the content quality, and create the knowledge depth and accurate link under the user's individual scene, so as to meet the functional, emotional and social needs under the panoramic view of the user's life. The deep cultivation of content production and the creation of high-quality content provide users with a knowledge-based operation including "long tail knowledge". Cultivate the industry competitiveness of "tail knowledge" according to the potential needs of users.

2) The consumption concept and behavior of users have changed significantly compared with the past. Users no longer simply pursue "free" content, impulsive payment has become rational payment, and users are more willing to pay for the profession. This leads to the intensification of the trend of survival of the fittest in knowledge, and professional content is more preferred. In the face of content homogenization competition, the platform needs to establish a scientific and reasonable screening mechanism. Through the

credit endorsement of the platform, or through the personal knowledge producer to build a brand, to solve the problem of user trust, create a word-of-mouth effect and increase competitiveness.

3) The platform should strengthen the protection of users' privacy and respect and maintain the intellectual property rights of content producers. The platform shall strictly abide by relevant laws and regulations to protect users' personal information from disclosure. Constantly transform the data service system, improve the system safety factor, improve the internal communication mechanism of the platform, and improve the user's sense of security.

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