An Empirical Study of User Intention to Pay for Knowledge in Virtual Communities (Postprint)

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Abstract

[Purpose/Significance] Exploring the influencing factors of users' knowledge payment intention in virtual communities contributes to a deeper understanding of users' knowledge payment behavior in such communities, assists content creators and virtual platform operators in gaining insights into user needs, and provides references for improving knowledge service quality and optimizing resource allocation. [Method/Process] Based on perceived value theory, this study investigates users' knowledge payment behavior in virtual communities, constructs a structural equation model for knowledge payment, and reveals the key factors influencing users' knowledge payment and their underlying mechanisms; using a questionnaire survey method, 321 valid sample data were collected, and based on this, the data were analyzed using the partial least squares structural equation modeling (PLS-SEM) method. [Results/Conclusion] Perceived value of virtual community users significantly positively influences their payment intention; perceived benefits (perceived usefulness, perceived trust) significantly positively affect perceived value, while perceived sacrifices (perceived risk, perceived cost) significantly negatively affect perceived value, and perceived value fully mediates the effect of perceived benefits and perceived sacrifices on users' payment intention; word-of-mouth negatively moderates the effect of perceived value on payment intention.

Full Text

Preamble

Empirical Study on Users' Knowledge Purchase Intention for Virtual Community

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Abstract

[**Purpose/Significance**] Exploring the factors influencing users' knowledge payment intention in virtual communities helps deepen understanding of user behavior regarding knowledge payment, assists content creators and virtual platform operators in comprehending user needs, and provides references for improving knowledge service quality and optimizing resource allocation. [**Method/Process**] Based on perceived value theory, this study investigates knowledge payment behavior among virtual community users, constructs a structural equation model for knowledge payment, and reveals the key factors and mechanisms affecting user knowledge payment. Using a questionnaire survey method, 321 valid sample data points were collected, and partial least squares structural equation modeling was employed for data analysis. [**Result/Conclusion**] Virtual community users' perceived value significantly and positively influences their payment intention. Perceived benefits (perceived usefulness and perceived trust) significantly and positively affect perceived value, while perceived sacrifices (perceived risk and perceived cost) significantly and negatively affect perceived value. Moreover, perceived value fully mediates the relationship between perceived benefits/sacrifices and payment intention. Word-of-mouth negatively moderates the effect of perceived value on payment intention.

Classification Number: G203
Keywords: Knowledge Payment, Perceived Value, Word-of-Mouth, Payment Intention

1. Introduction

H. Rheingold [1] first defined virtual community in 1993 as "a social aggregation on the Internet where people regularly discuss common topics, develop emotional connections, and form interpersonal networks." The flourishing development of virtual communities has broken through physical limitations on knowledge and information exchange, facilitating knowledge sharing among individuals. Currently, the most common virtual communities are professional or practice-based communities where users voluntarily exchange and share knowledge. However, knowledge shared in these communities is considered a public good, freely accessible to all users, and thus cannot generate economic value [2]. The demand for economic rewards among knowledge contributors in virtual communities has motivated platform operators to explore knowledge payment models to realize the economic value of knowledge monetization. The essence of knowledge payment is transforming knowledge into products or services and selling them via the Internet to achieve commercial value.

According to the "China Sharing Economy Development Report 2017"[4] released by the State Information Center Sharing Economy Research Center, China' s knowledge sharing market has already reached considerable scale, with transaction volume in the knowledge and skills sector reaching approximately 61 billion yuan in 2016, representing a 205% year-over-year increase, and approximately 300 million users. An iResearch report indicates that the number of Chinese content payment users reached 98 million in 2016 and is projected to reach 292 million by 2018 [5]. Knowledge payment users are growing rapidly, and the market is facing explosive growth, making knowledge payment a new "hotspot." However, the 14th National Reading Survey Report [6] shows that only 25.2% of mobile reading users are willing to pay for content. This low payment intention stands in stark contrast to the rapidly growing payment market, raising the question: what factors influence users' payment intention? Therefore, investigating the factors affecting virtual community users' payment intention holds important practical significance.

Most existing research focuses on free knowledge sharing [11], with insufficient in-depth study of knowledge payment. Information overload has made truly valuable knowledge scarce, making knowledge payment an inevitable trend. Zhang et al. [12] used grounded theory to explore factors influencing knowledge payment, Zhou et al. [13] examined knowledge payment behavior based on social capital theory, Zhao et al. [14] investigated factors influencing continuous usage of knowledge payment apps, and Liu et al. [15] explored operational models of paid knowledge communities. In summary, research on knowledge payment remains in its infancy. This study will deeply explore the influencing factors of users' knowledge payment intention, which will help enrich the theoretical system of knowledge payment and holds important theoretical significance.

The commercial potential of knowledge payment depends on users' motivation to continuously purchase and use paid knowledge products. Existing research indicates that enabling users to perceive value in paid knowledge products is crucial. However, the virtual nature of knowledge payment makes user behavior more complex, and factors influencing Internet payment intention differ significantly from those affecting traditional physical purchase behavior. Therefore, studying the influencing factors of virtual community users' knowledge payment intention is essential. Based on perceived value theory and considering the particularities of knowledge payment, this study introduces relevant contextual factors to construct a model of factors influencing virtual community users' knowledge payment intention, aiming to accurately identify these factors and help content creators and virtual platform operators understand user needs, thereby improving knowledge service quality and optimizing resource allocation.

2. Theoretical Foundation and Research Model

2.1 Theoretical Foundation

2.1.1 Payment Intention Payment intention (PI) refers to the likelihood of users purchasing a specific product or brand [16] and has been proven to be an important indicator for predicting consumer behavior. Many e-commerce studies have shown that user payment intention is a key indicator for participating in e-commerce transactions [17]. Synthesizing previous research, this study defines payment intention as virtual community users' subjective willingness to purchase knowledge products or services. Previous research on payment intention has mainly focused on three aspects: (1) studies based on consumer attitude theory [18-19]; (2) studies based on planned behavior theory [20-21]; and (3) studies based on perceived value theory [22-23]. This study will examine knowledge payment intention from a perceived value perspective to explore the formation mechanism of virtual community users' payment intention.

2.1.2 Perceived Value Recent research on payment behavior has increasingly recognized the importance of perceived value. Perceived value (PV), originating from consumer behavior studies, was defined by V.A. Zeithaml [24] as the result of users' comparative evaluation of benefits gained versus costs incurred during consumption. W.B. Monroe et al. [16] further refined this concept, viewing perceived value as the ratio between perceived benefits and perceived sacrifices. Value can be increased by either enhancing benefits or reducing the sacrifices associated with purchase and use [25]. In e-commerce environments, many scholars have confirmed that perceived value positively influences consumer payment intention and consider it the most critical factor affecting user payment intention [26-28]. Knowledge payment, termed "knowledge e-commerce," can be viewed as a special form of e-commerce. While typical e-commerce sells tangible goods requiring warehousing and logistics, knowledge e-commerce sells intangible knowledge products without such requirements. However, empirical research on this special form of e-commerce remains scarce. This study incorporates users' perceived value as a key factor influencing payment intention in constructing the theoretical model of factors affecting virtual community users' knowledge payment. Perceived usefulness and perceived trust are used to measure perceived benefits, while perceived cost and perceived risk measure perceived sacrifices, constructing a framework of perceived value' s influence on users' knowledge payment intention, as shown in Figure 1 [Figure 1: see original paper].

2.2 Research Model and Hypotheses

This study focuses on factors influencing virtual community users' knowledge payment intention. Based on perceived value theory and incorporating word-of-mouth, the research model explores the effects of perceived usefulness, perceived risk, perceived cost, and perceived trust on perceived value, and subsequently examines the effect of perceived value on payment intention, while also testing

the mediating role of perceived value and the moderating role of word-of-mouth. The research model is shown in Figure 2 [Figure 2: see original paper].

In this study, virtual community perceived value refers to users' overall evaluation of the benefits (get) and sacrifices (given) obtained when using paid knowledge products, as well as the utility of paid knowledge products. V.A. Zeithaml [24] found that when users perceive higher value in a product or service, their payment intention also increases. A. Eggert and W. Ulaga [29] argued that perceived value is the most important factor truly driving user payment behavior. J.L.M. Tam [30] demonstrated that perceived value better predicts purchase behavior than satisfaction. Y.F. Kuo et al. [31] found that perceived value positively affects satisfaction and purchase intention in mobile value-added services. Therefore, it is reasonable to argue that in virtual community environments, when users perceive higher value in knowledge products, these products become more attractive, and users are more willing to pay for them. Thus, this study hypothesizes:

H1: Virtual community users' perceived value of knowledge products significantly and positively affects their payment intention.

2.2.1 Perceived Benefits Perceived benefits can be actual benefits, such as practical utility, or potential benefits, such as perceived quality, perceived enjoyment, or perceived trust. W.B. Zeithaml [24] found that when users perceive higher benefits from a product or service, their perceived value also increases. Based on the characteristics of knowledge products, this study uses perceived usefulness and perceived trust as perceived benefits.

Perceived usefulness (PU) is defined as the degree to which users believe that using new technology will enhance or improve performance [32]. In the virtual community context, usefulness refers to the degree to which users believe knowledge products can improve their knowledge or skills, thereby enhancing work performance. Huang [33] demonstrated that perceived usefulness of mobile payment positively affects perceived value. Zheng et al. [34] confirmed that users' self-efficacy and perceived usefulness of mobile shopping affect perceived value. Y.F. Kuo et al. [31] confirmed that perceived value positively affects user satisfaction and purchase intention when evaluating mobile value-added services. Therefore, it is reasonable to argue that in virtual community environments, when users perceive higher usefulness in knowledge products, they consider them more valuable and are more willing to pay for them. Thus, this study hypothesizes:

H2a: Virtual community users' perceived usefulness of knowledge products significantly and positively affects their perceived value.

H2b: Virtual community users' perceived usefulness of knowledge products significantly and positively affects their payment intention.

Perceived trust (PT) plays an important role in online transactions. Trust is

an implicit belief that one party will rely on another to act in a certain way and is confident that the other party will not exploit its vulnerabilities [35], and is considered an important factor affecting knowledge sharing [36]. In electronic transactions, the lack of face-to-face communication and legal protection makes it difficult for users to pay for knowledge products, making user trust potentially more important than in traditional "real world" transactions. Perceived trust can reduce non-monetary costs such as time and effort [37] and perceived online shopping risks, thereby enhancing perceived value [27]. D.H. McKnight et al. [38] noted that higher trust in online shopping increases purchase likelihood. P.A. Pavlou [39] showed that individual behavioral decisions are primarily governed by behavioral intentions, and that greater trust in online shopping leads to stronger purchase intention. Therefore, it is reasonable to argue that in virtual community environments, when users have greater trust in platforms, knowledge creators, and knowledge products, they perceive higher value in knowledge products and are more willing to purchase them. Thus, this study hypothesizes:

H3a: Virtual community users' perceived trust of knowledge products significantly and positively affects their perceived value.

H3b: Virtual community users' perceived trust of knowledge products significantly and positively affects their payment intention.

2.2.2 Perceived Sacrifices Perceived sacrifice includes monetary and non-monetary costs, referring to the sum of time, money, and effort costs involved in using products or services, as well as risks such as poor product performance and privacy exposure [40-41]. This study uses perceived risk and perceived cost to measure perceived sacrifice.

Perceived risk (PR) is an important factor hindering online payment. D.J. Kim et al. [42] defined perceived risk as users' perception of potential uncertain negative factors in online transactions. R.A. Bauer [43] argued that most consumer behavior involves risk-taking, and consumers perceive risk because they cannot predict the outcomes of purchase behavior and their probabilities. In online shopping, there are three main risks: financial risk, product risk, and information risk [44], which have been shown to significantly negatively affect consumer behavioral intention [45]. J.C. Sweeney et al. [46] found that perceived risk plays an important negative role in perceived value. S. Agarwal et al. [47] argued that perceived performance risk and financial risk negatively affect perceived value and moderate the relationship between perceived quality/sacrifice and perceived value. Therefore, when users in virtual communities perceive risks such as the inability to continuously provide high-quality knowledge or substandard product quality, their perception of product value may decrease. Thus, we propose:

H4: Virtual community users' perceived risk of knowledge products significantly and negatively affects their perceived value.

Perceived cost (PC) refers to all costs users perceive when purchasing products

or services. P.E. Murphy et al. [48] divided perceived cost into monetary costs such as equipment and transaction fees, and non-monetary costs such as time and effort. Y. Sun et al. [49] divided perceived cost into actual cost and opportunity cost, demonstrating that opportunity cost affects knowledge contribution intention more than actual cost. Cost is an essential factor in evaluating mobile Internet value [50]. V.A. Zeithaml [24] showed that reducing user costs can enhance their perceived value. If users can easily access product information, they can save time and effort, obtaining higher perceived value. C.W. Chu et al. [51] found that perceived price negatively correlates with perceived value of online music. Therefore, in virtual communities, higher perceived cost of knowledge products leads to lower perceived value. Thus, this study hypothesizes:

H5: Virtual community users' perceived cost of knowledge products significantly and negatively affects their perceived value.

2.2.3 Word-of-Mouth Word-of-mouth (WOM) refers to informal communication between users about products or services [52], and information exchange among users through Internet media [53]. Previous e-commerce research has shown that online reviews and other forms of electronic word-of-mouth may affect user purchase decisions [54]. L.Y. Lin et al. [55] studied the effects of corporate image, relationship marketing, and trust on purchase intention, finding that positive word-of-mouth moderates the effect of trust on consumer purchase intention. X. Li et al. [56] confirmed that word-of-mouth moderates the effect of supplementary forms on consumer purchase intention. R. Nongnuch [57] found that word-of-mouth moderates the effect of perceived value on payment intention in relationship marketing research. Based on these studies, this study hypothesizes:

H6: Word-of-mouth about knowledge products in virtual communities negatively moderates the effect of perceived value on payment intention.

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3. Research Methods

3.1 Questionnaire Design

The research model includes nine first-order reflective latent variables. To ensure content validity, all latent variables and measurement items in this study were derived from or adapted from existing literature. Specifically, perceived usefulness was adapted from F.D. Davis [32] with contextual modifications; perceived trust was adapted from R.C. Mayer et al. [58]; perceived cost from A. Kankanhalli et al. [59]; perceived risk from D.J. Kim et al. [42]; perceived value from Y.F. Kuo et al. [31] and H.W. Kim et al. [27]; word-of-mouth from M. Lee et al. [60]; and payment intention from H.W. Kim et al. [27]. Each latent variable consists of 3-4 measurement items. The questionnaire uses a seven-point Likert scale, with 1-7 representing "strongly disagree" to "strongly agree." The constructs and items are shown in Table 1 .

3.2 Data Collection

After initial questionnaire design, it was published on Wenjuanxing and distributed via WeChat to 20 users with knowledge payment experience for a pilot survey. Based on respondent feedback, ambiguous concepts in measurement items were carefully revised to ensure respondents could understand the items and respond accurately during the formal survey. The formal large-scale survey was then launched, restricting participation to users with knowledge product usage experience and offering a 5 RMB red envelope with a 30% winning rate to encourage participation. The survey was open to all Wenjuanxing users, who could participate without invitation. Additionally, we randomly selected respondents through QQ groups, WeChat groups, and email invitations. The questionnaire was administered from March 15, 2016, for six weeks, ultimately collecting 321 valid responses. Respondent demographic information is shown in Table 2 . The sample characteristics are: males account for 43.4% and females for 56.7% of the total sample; most respondents are aged 18-45, consistent with Baidu Index data showing that 90% of knowledge payment users are aged 20-49 [61].

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4. Data Analysis

4.1 Measurement Model Analysis

We evaluated the measurement model' s validity through reliability and validity tests. Composite reliability (CR) and Cronbach' s alpha were used to test reliability; generally, the minimum value for both should be 0.7 [62]. Table 3 shows that all CR values exceed 0.866, and the minimum Cronbach' s alpha is 0.725, indicating good reliability.

Content validity, convergent validity, and discriminant validity were used to assess measurement model validity. All items were adapted from existing literature and pre-tested, suggesting good content validity. Average variance extracted (AVE) measures convergent validity, with values greater than 0.5 indicating ideal convergent validity [62]. Table 3 shows the minimum AVE is 0.619, indicating satisfactory convergent validity. The square root of each latent variable' s AVE exceeds its correlation coefficients with other latent variables, demonstrating good discriminant validity [62], as shown in Table 4 .

Given that data were collected in the same measurement environment from homogeneous respondents, common method bias may exist. We conducted Harman' s single-factor test [63] using principal component analysis in SPSS. The results showed the first factor accounts for 47% of variance, not constituting the majority. Additionally, following H. Liang et al. [64], we created a common method bias latent variable, allowing all items to load on this method factor and tested the coefficients of both paths for each item. The results show that each item is primarily explained by substantive path coefficients rather than method

path coefficients (see Table 5). Therefore, common method bias is not present in this study.

4.2 Structural Model Analysis

We analyzed the data using partial least squares structural equation modeling and tested the structural model and hypotheses using SmartPLS 2.0, with bootstrapping (1,000 resamples) to test path coefficient significance. The model results are shown in Figure 3 [Figure 3: see original paper]. Perceived value (R^2 = 0.507) and payment intention (R^2 = 0.420) indicate good predictive power [62]. Except for the non-significant effects of perceived usefulness and perceived trust on payment intention, all other hypothesized relationships were supported.

As shown in Table 4, the correlation coefficients between perceived usefulness/perceived trust and payment intention are 0.436 and 0.585 respectively, with significant independent effects. However, Figure 3 shows H2b (β = 0.030, p > 0.100) and H3b (β = 0.082, p > 0.100) are not supported, suggesting the effects of perceived usefulness and perceived trust on payment intention are masked by other constructs. To explain this phenomenon, we conducted hierarchical regression analysis. Tables 6 and 7 show that when perceived value is not in the model, perceived usefulness/trust significantly affects payment intention; when perceived value is included, these effects become non-significant.

4.3 Mediating Effect Detection

We used Baron and Kenny' s [65] causal steps method to test mediating effects: (1) test the effect of independent variables on the dependent variable; (2) test the effect of independent variables on the mediator; (3) when the mediator is included, test the effect of independent variables on the dependent variable—if both independent and mediator variables are significant, partial mediation exists; if only the mediator is significant, full mediation exists. The results in Table 8 show that perceived risk (β = -0.217, p < 0.001) and perceived cost (β = 0.205, p < 0.001) significantly affect payment intention, but when perceived value is included as a mediator, perceived risk (β = -0.044, p > 0.100) and perceived cost (β = 0.069, p > 0.100) have no significant effect, indicating full mediation. Perceived usefulness (β = 0.414, p < 0.001) and perceived trust (β = 0.499, p < 0.001) significantly affect payment intention; when perceived value is included, both perceived usefulness (β = 0.123, p < 0.05) and perceived value (β = 0.208, p < 0.001) have significant direct effects, suggesting partial mediation. However, in the full model, perceived usefulness/trust has no significant effect on payment intention (see Figure 3), indicating that perceived value fully mediates the effects of perceived usefulness and perceived trust on payment intention.

4.4 Moderating Effect Test of Word-of-Mouth

The study found that word-of-mouth (β = -0.110, p < 0.01) significantly negatively moderates the effect of perceived value on payment intention. To more accurately demonstrate this significant interaction, we further tested the effect of perceived value on payment intention under high and low word-of-mouth conditions. Following K.J. Stewart [66], we used the mean of word-of-mouth to divide the sample into groups and conducted linear regression for perceived value and payment intention in each group using SPSS, judging the moderating effect through regression line slopes. As shown in Figure 4 [Figure 4: see original paper], under high word-of-mouth conditions, the relationship between perceived value and payment intention is significantly negative. Conversely, low word-of-mouth not only weakens this relationship but shows a positive slope (k = 0.993), indicating a positive trend between perceived value and payment intention. The comparison reveals that word-of-mouth has a significant moderating effect on the relationship between perceived value and payment intention. In other words, when word-of-mouth levels are high, users tend to ignore the influence of product perceived value on payment intention.

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5. Conclusions and Implications

5.1 Research Findings

This study examines factors influencing users' knowledge payment intention in virtual communities based on perceived value theory. Perceived usefulness, perceived trust, perceived cost, perceived risk, and perceived value were identified as key factors affecting knowledge product payment intention. The study yields several valuable findings.

(1) Virtual community users'perceived value significantly and positively affects their payment intention. This means that in virtual community knowledge payment contexts, perceived value is a critical determinant. When users are willing to spend time, effort, and money on paid knowledge products, they develop strong payment intention. This finding is consistent with previous research [23, 28, 31].

(2) Virtual community users' perceived benefits (perceived usefulness, perceived trust) and perceived sacrifices (perceived cost, perceived risk) significantly affect perceived value, and perceived value fully mediates the relationship between perceived benefits/sacrifices and payment intention. Specifically, perceived benefits significantly and positively affect perceived value, indicating that benefits motivate users to participate in knowledge payment. Trust is the primary reason users adopt paid knowledge products, having the strongest effect on perceived value. Product usefulness is the second reason for continued use, also significantly and positively affecting perceived value. Users are motivated to continue using and rec-

ommending paid knowledge products because they provide both intrinsic benefits (perceived trust) and extrinsic benefits (perceived usefulness). Perceived sacrifices negatively affect perceived value, indicating that when users perceive high risks and costs in paid knowledge products, the benefits of purchase decrease, reducing their willingness to buy. The mediating effect of perceived value indicates that perceived usefulness, perceived trust, perceived risk, and perceived cost cannot directly affect payment intention—they must be transformed into perceived value to influence payment intention. The trade-off between benefits and sacrifices, namely perceived value, is the key link connecting perceived benefits/sacrifices and user payment intention. Therefore, to maximize users' perceived value, it is necessary to increase perceived benefits and reduce perceived sacrifices.

(3) Word-of-mouth plays an important moderating role in virtual community environments. The study found that word-of-mouth negatively moderates the effect of perceived value on payment intention. When word-of-mouth evaluation levels are high, users tend to ignore knowledge product value and develop payment intention; when word-of-mouth levels are low, users are more likely to consider product value, paying only when they perceive high knowledge value. This finding differs from previous research —R. Nongnuch [57] found positive moderation in relationship marketing. Possible explanations include the relatively low price of knowledge products and users' insecurity and anxiety about information overload, making them more susceptible to high word-of-mouth influence and thus ignoring product value itself.

(4) However, perceived usefulness and perceived trust do not significantly affect payment intention. The reason is that in the full model, perceived value fully mediates their effects. Only when transformed into perceived value can perceived usefulness and perceived trust influence payment intention.

5.2 Theoretical Implications

This study enhances understanding of user knowledge payment behavior in virtual communities and advances theoretical development in this field. Specific theoretical contributions include:

(1) This study develops a model of virtual community users' knowledge payment intention based on perceived value theory, enriching existing research and advancing theoretical development in virtual community knowledge payment. Previous research has primarily focused on knowledge sharing without economic exchange, examining knowledge contribution and search behaviors. Although Y. Sun et al. [49] explored knowledge sharing in transactional virtual communities, emphasizing economic factors over social factors, the fundamental behavioral mechanisms of knowledge payment remain unexplored.

(2) This study extends understanding from free knowledge sharing to paid knowledge sharing by identifying differences between the two and explaining their behavioral motivations. Knowledge sharing and knowledge payment have two key differences: (1) knowledge is considered a public good in sharing behavior but a private good in payment behavior; (2) knowledge sharing follows social exchange principles, while knowledge payment follows economic exchange principles. These differences mean the mechanisms explaining knowledge sharing behavior differ. In knowledge payment, users purchase knowledge products from contributors for economic benefit, making economic exchange the principle. Since users must spend time, effort, and money, they focus more on product value.

(3) This study is among the few in knowledge payment research that uses perceived value as a mediator between perceived benefits/sacrifices and payment intention; most existing research treats perceived value as an antecedent [22, 42]. This study shows that in virtual communities, both perceived benefits and sacrifices are significant factors, and perceived value better reflects user payment intention than perceived benefits or sacrifices alone. This finding has two important implications: (1) when perceived sacrifice is non-negligible, value does not equal benefits but depends on the benefit-sacrifice ratio, and ignoring either aspect may lead to inaccurate value estimation; (2) benefits and sacrifices cannot directly affect payment intention but must be transmitted through perceived value, making their influence indirect. Recognizing perceived value' s mediating role helps understand the fundamental mechanisms through which perceived benefits and sacrifices affect payment intention. Importantly, this study also identifies word-of-mouth' s moderating role, showing that it significantly negatively moderates the effect of perceived value on payment intention, further enriching perceived value theory.

5.3 Practical Implications

This study offers the following guidance for content creators and virtual platform operators:

(1) Perceived value is the core factor affecting payment intention. Content creators, as knowledge contributors, should recognize individual user differences, provide personalized and valuable knowledge products, and offer incentive rewards to users who complete learning tasks. Virtual platform operators can increase product value by providing bundled knowledge products and free value-added services, or by establishing benchmark prices for knowledge products, enabling users to purchase interesting products at reasonable costs and obtain greater benefits.

(2) Perceived benefits and sacrifices significantly affect perceived value, and perceived value fully mediates their effects on payment intention. Therefore, content creators should target different user groups, provide useful

knowledge, enhance their reputation and expertise, increase user trust, reduce risk perception, exchange the most useful knowledge at the lowest price, and reduce users' cost concerns. As intermediaries between creators and consumers, virtual platform operators should provide adequate support to facilitate information exchange, enhance trust between parties, and achieve win-win-win outcomes. Based on these findings, operators should establish user-friendly interfaces, provide valuable services, meet users' needs for useful knowledge products (knowledgeable, entertaining, and social), increase platform trust, reduce usage costs and actual risks, and help users obtain greater benefits.

(3) Word-of-mouth negatively moderates the effect of perceived value on payment intention. Content creators should build good reputations to attract more users and convert them into fans, as loyal fans are more willing to pay for their favorite creators. For virtual platform operators, establishing good evaluation mechanisms to guide users to actively review knowledge products and share interesting products on WeChat, Weibo, and other social platforms is crucial, as recommendations from acquaintances more easily stimulate payment intention.

5.4 Research Limitations

This study has several limitations: (1) It employs field research rather than controlled laboratory experiments, surveying real users of Chinese virtual community knowledge payment. Future laboratory-controlled studies measuring payment intention would provide more accurate results and stronger support. (2) This study was conducted in Chinese knowledge payment virtual communities. Although similar platforms exist in the U.S. (e.g., Quora, Skillshare, Coursera), the effects of perceived trust and perceived risk on perceived value may differ due to cultural differences, necessitating further research on Western knowledge payment. Future studies could focus on cross-cultural effects on payment intention.

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Author Contributions

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English Abstract

[Purpose/significance] To explore the influencing factors of users' purchase intention for knowledge in virtual communities helps to understand users' knowledge payment behavior in virtual communities, helps content creators and virtual platform operators to understand users' needs, and provides reference for improving the quality of knowledge services and optimizing resource allocation. **[Method/process]** Based on the theory of perceived value, this paper studies the knowledge payment behavior of virtual community users, constructs a structural equation model of knowledge payment, reveals the key factors and mechanisms that affect users' knowledge payment, and uses the questionnaire survey method to collect 321 valid sample data. On this basis, the partial least squares structural equation model method is used to analyze the data. **[Result/conclusion]** The perceived value of virtual community users significantly affects their payment intention. Perceived benefit (perceived usefulness, perceived trust) significantly affects perceived value, and perceived sacrifice (perceived risk, perceived cost) significantly affects perceived value, and perceived value plays a completely mediating role in the effect of perceived benefit and perceived sacrifice on users' payment intention. Word-of-mouth negatively moderates the effect of perceived value on payment intention.

Keywords: pay for knowledge; perceived value; word-of-mouth; purchase intention