

User Willingness to Pay for Knowledge on Chinese Online Q&A Platforms: An Individual-Community Perspective (Postprint)

Authors: Chi Zhao, Xiang Fei

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Abstract

[Purpose/Significance] From an individual-community perspective, this study investigates the influencing factors of users' knowledge payment intention on online Q&A platforms, providing theoretical reference for the sustainable development of knowledge payment platforms from a user research standpoint. [Method/Process] Integrating the Technology Acceptance Model and Perceived Value Theory, a theoretical model was constructed. Relevant data were collected via questionnaire surveys, and SPSS, AMOS, and other software were employed for reliability and validity testing as well as structural equation modeling analysis to verify the research hypotheses based on the analytical results. [Results/Conclusion] The research results confirm the feasibility of the theoretical model and examine the path coefficients of factors influencing users' knowledge payment intention on online Q&A platforms. Perceived usefulness, practical value, hedonic value, economic cost, and interpersonal influence exert positive effects on users' knowledge payment intention.

Full Text

Research on Users' Willingness to Pay for Knowledge in Domestic Online Q&A Platforms from the Individual-Community Perspective

Zhao Chi, Xiang Fei

School of Medicine and Health Management, Huazhong University of Science and Technology, Wuhan 430074

Abstract

This study explores the influencing factors of users' willingness to pay for knowledge in domestic online Q&A platforms from an individual-community perspective, providing theoretical references for the sustainable development of knowledge payment platforms from the user research level.

[Method/Process] Combining the Technology Acceptance Model (TAM) and Perceived Value Theory, this research constructs a theoretical model. Relevant data were collected through questionnaire surveys, and reliability and validity tests as well as structural equation model analysis were conducted using SPSS, AMOS, and other software to verify research hypotheses based on the analysis results.

[Result/Conclusion] The results validate the feasibility of the theoretical model and examine the path coefficients of factors influencing users' payment intentions in online Q&A platforms. Perceived usefulness, practical value, hedonic value, economic cost, and interpersonal influence all exert positive effects on users' knowledge payment intentions.

Keywords: knowledge payment; Technology Acceptance Model; Perceived Value Theory; structural equation model; community attributes

Introduction

With the rapid development of internet technology, China's consumption structure has shifted from focusing on basic survival needs to pursuing high-quality knowledge and information. As a new model of the sharing economy, knowledge payment has experienced swift growth, with domestic knowledge payment users exceeding 400 million in 2019 [1]. Knowledge payment refers to a novel information interaction model where consumers pay for fragmented online knowledge with clear learning objectives, and respondents share their knowledge resources through internet platforms to obtain income [2]. This development has also driven innovation in online knowledge Q&A platforms. Traditional Q&A platforms were typically free, but as the industry evolved, paid Q&A models emerged [3]. In paid knowledge Q&A platforms, questioners can pay for targeted consultations with specific professional respondents in an independently associated model, providing customized service environments with specificity and timeliness. Moreover, research by T. C. Lin et al. [4] demonstrates that paid questions receive higher-quality answers compared to free ones. Consequently, paid online Q&A platforms have become important media for internet users to acquire knowledge [5].

Current research on payment intentions in online Q&A platforms primarily examines user behavior from a single dimension. For instance, W. Dou et al. [6] studied users' knowledge payment intentions based on Perceived Value Theory, using the commodity attributes of knowledge payment as the research entry

point and measuring users' perceived value by comparing costs paid before using the product with benefits obtained after use. A. Bandura [7] employed the Theory of Planned Behavior from an individual intention perspective, examining users' purchase intentions through subjective norms and behavioral attitudes. Xia Qingsong [8] investigated continuous usage intentions of online teaching platforms based on TAM, treating the platform as a new technology product and analyzing user intentions through its perceived usefulness and ease of use. However, knowledge payment products represent both a new technology product in the internet era and a paid commodity in the competitive market, possessing both technological and commercial characteristics. Therefore, examining users' payment intentions from only one characteristic perspective lacks comprehensiveness and accuracy. Additionally, existing knowledge payment research typically adopts an individual perspective, studying users' payment intentions solely from personal subjective norms and value judgments while neglecting the increasingly prominent community attributes.

As internet technology advances, various community organizations have permeated daily life, such as WeChat groups, forums, and Weibo, continuously influencing users' lifestyle and consumption habits. For example, users habitually refer to other users' evaluations before consumption, consult others' experiences on social media like Moments, and enjoy sharing their own usage experiences to recommend well-performing products to others. Knowledge payment users possess not only individual attributes but also community attributes. User behavior is no longer solely influenced by personal consciousness but also by mutual influences among community members. In summary, this study integrates TAM and Perceived Value Theory to comprehensively analyze factors influencing users' payment intentions, while introducing community-related latent variables—"online word-of-mouth" and "interpersonal influence"—to examine online Q&A platform payment intentions more comprehensively from different levels, thereby enriching existing theoretical models and providing new research perspectives.

Literature Review and Theoretical Model

Technology Acceptance Model

The Technology Acceptance Model (TAM), developed by American scholar F. D. Davis [9] in 1986 based on the Theory of Reasoned Action, is primarily used to analyze and predict users' cognition, attitudes, and behaviors toward new technologies. TAM identifies perceived usefulness and perceived ease of use as the main factors influencing users' intentions to adopt new technologies. Perceived usefulness refers to users' subjective belief that using the technology can improve their work performance, thereby generating behavioral intention and actual usage. Perceived ease of use refers to users' judgment of how easy the technology is to use, which affects their behavioral intention and actual usage. Many TAM-based studies on factors influencing users' payment intentions indicate that perceived usefulness and perceived ease of use have the greatest

impact. For example, Xia Qingsong [8] verified that perceived usefulness positively affects usage intentions among vocational students using online teaching platforms, while subjective norms and satisfaction indirectly influence continuous usage intentions. Zhao Feifei [10] found that perceived ease of use is one of the main factors influencing knowledge payment intentions in online Q&A communities.

Online Q&A platforms represent a new technology that has emerged in recent years. Users typically evaluate rationally whether such products can further improve their work efficiency compared to traditional technologies, thereby affecting their usage intentions. Therefore, this study primarily examines factors influencing domestic users' payment behaviors on online Q&A platforms from individual and community perspectives, using perceived usefulness based on TAM [10].

Customer Perceived Value Theory

Customer Perceived Value Theory was proposed by American scholar V. A. Zeithaml [11], referring to users' overall evaluation of a product or service by weighing the benefits and sacrifices involved. This theory is widely applied in user payment behavior research. For instance, Li Wu et al. [12] explored factors influencing users' paid questioning behaviors on online paid Q&A platforms from a perceived value perspective, finding that both perceived benefits and perceived sacrifices effectively influence perceived value. Chen Hao et al. [13] constructed a conceptual model of consumer knowledge payment behavior by integrating Expectation-Confirmation Theory and Perceived Value Theory, discovering that perceived benefits significantly affect consumer satisfaction with knowledge services.

Users paying for online Q&A need to invest time, effort, and money while obtaining certain value. Their willingness to pay depends on whether the trade-off between obtained value and sacrificed costs is worthwhile. Therefore, this study borrows concepts from Perceived Value Theory, such as perceived benefits and perceived sacrifices, to examine factors influencing online Q&A payment intentions [10].

Research Hypotheses

Perceived Usefulness and Payment Intention. As various knowledge payment products continue to emerge, increasing numbers of users expect to use these new platforms to improve their learning performance. This study examines the degree of perceived usefulness users experience with online Q&A platforms and its influence pathways on payment intentions. When users believe that using online Q&A platforms helps them acquire knowledge, their payment intentions strengthen. Therefore, this study proposes:

H1: Users' perceived usefulness has a significant positive effect on online Q&A payment intention.

Perceived Value and Payment Intention. In this study's context, perceived value of online Q&A platforms refers to users' evaluation comparing the knowledge and Q&A experience obtained with the time, effort, and money costs paid [14]. Existing research shows that perceived value positively affects users' payment intentions. Li Weiqing et al. [15] found that perceived value plays a major role in influencing users' payment intentions. Scholars typically treat perceived value as a mediating variable between latent independent variables and payment intention. Therefore, this study hypothesizes:

H2: Perceived value has a significant positive effect on payment intention.

Perceived Benefits and Perceived Value. Perceived benefits refer to the gains users experience at both practical and spiritual levels when paying for online Q&A platforms [16]. This study divides perceived benefits into practical value and hedonic value. Practical value refers to the functional utility users perceive from paid online Q&A, such as high-quality teaching experiences during trial periods and the practicality of acquired knowledge. Chen Hao et al. [13] clarified the important role of practical value in consumption intentions. Therefore, it is reasonable to infer that users' perceived value of online Q&A payment is positively correlated with their perceived practical value. This study hypothesizes:

H3: Practical value has a significant positive effect on perceived value.

Hedonic value refers to emotional factors such as spiritual pleasure and self-fulfillment that users experience through paid behaviors on online Q&A platforms. Yang Yi et al. [17] verified the positive effect of hedonic value on purchase intentions, while Zhao Yuxiang et al. [1] showed that hedonic value is one of the most significant factors affecting perceived value. Therefore, it is reasonable to infer that users' perceived value of online Q&A payment is positively correlated with their perceived hedonic value. This study hypothesizes:

H4: Hedonic value has a significant positive effect on perceived value.

Perceived Sacrifices and Perceived Value. Perceived sacrifices of online Q&A payment refer to the monetary and time costs users pay when using online Q&A platforms [12]. This study divides perceived sacrifices into economic cost and compilation cost. Economic cost refers to the money users pay to use online Q&A platforms. Li Wu et al. [12] noted that online Q&A platform users are relatively sensitive to cost expenditures. H. W. Kim [18] showed that perceived value is inversely affected by perceived price. Therefore, it is reasonable to infer that users' perceived value of online Q&A payment is negatively correlated with their perceived economic cost. This study hypothesizes:

H5: Economic cost has a significant negative effect on perceived value.

Compilation cost refers to the time or effort users spend using online Q&A platforms. After paying for online Q&A, users still need to invest time and effort to use the product, including processes such as knowledge externalization and visualization. Therefore, besides monetary payment, online Q&A payment also

involves editing questions, searching for answers, and tipping or following up on responses, generating compilation costs. C. W. Chu et al. [19] found that compilation cost significantly affects users' knowledge payment. Therefore, it is reasonable to infer that users' perceived value of online Q&A payment is negatively correlated with their perceived compilation cost. This study hypothesizes:

H6: Compilation cost has a significant negative effect on perceived value.

Community Influence and Payment Intention. For online Q&A platforms, user behavior is typically influenced by social relationships, such as classmates and friends [9]. Based on TAM and Customer Perceived Value Theory, this study adds the variable of community influence, which refers to users' behavior being affected by the behaviors of surrounding communities. Users are often willing to share valuable answers obtained through payment with friends or family and refer to surrounding groups' opinions when selecting online Q&A platforms. Zhao Feifei et al. [10] showed that community influence has the strongest effect on users' payment intentions. Cui Xuelian et al. [20] demonstrated that online word-of-mouth with good trust relationships can effectively influence information dissemination and user behavior among community relationships. Existing research also indicates that interpersonal relationships are important factors in community influence [10]. Therefore, this study divides community influence into online word-of-mouth and interpersonal influence.

Convergent effect is a mechanism in system evolution where subjects influence each other to conduct similar adaptive learning activities [21]. In this study's context, users live in their respective communities and circles, where other members' behaviors and consciousness exert strong homogenous influences on users' own behaviors and consciousness. Therefore, it is reasonable to infer that users' perceived value of online Q&A payment is positively correlated with the interpersonal influence they experience. This study hypothesizes:

H7: Interpersonal influence has a significant positive effect on payment intention.

Online word-of-mouth refers to evaluations users conduct on online Q&A platforms. Currently, online user comments have become important references for new users before using online Q&A platforms. H. V. D. Heijden et al. [22] discussed the relationship between online word-of-mouth and consumer perceived risk, finding that referring to trustworthy online reviews can effectively reduce consumer decision-making risks. Platforms with better word-of-mouth evaluations typically mean other users have obtained good Q&A payment experiences, serving as important references during user decision-making. Previous research has confirmed that negative online word-of-mouth has a stronger impact on purchase decisions than positive word-of-mouth. Fang Aihua et al. [23] noted that online word-of-mouth negatively moderates the effect of perceived value on payment intention. Therefore, it is reasonable to infer that users' perceived value of online Q&A payment is positively correlated with the evaluation level of platform online word-of-mouth. This study hypothesizes:

H8: Online word-of-mouth negatively affects users' payment intention.

The theoretical model constructed in this study is shown in [Figure 1: see original paper].

Research Design

Measurement Items

This study collected sample data through questionnaire surveys. Based on existing mature scales and combined with latent variables related to perceived usefulness and perceived value theory, the questionnaire was designed. Each latent variable includes 3-4 measurement items, recorded using a five-point Likert scale. The questionnaire contains 9 latent variables and 30 measurement items, as shown in .

The questionnaire was designed through the “Wenjuanxing” platform and distributed through social network platforms, including QQ groups, WeChat groups, and Weibo. To ensure reasonable age distribution, survey links were selectively distributed to groups with different age structures when sent through group chats. The questionnaire distribution lasted approximately two months, with 650 responses collected. After eliminating invalid questionnaires with excessively short completion times or too many conflicting answers, 571 valid questionnaires were retained.

Data Analysis

Descriptive Statistical Analysis

The demographic characteristics of the 571 sample data in show the distribution of survey respondents, where the mean represents central tendency and standard deviation represents fluctuation. According to the frequency results of each variable, the distribution basically meets sampling survey requirements. The 571 respondents have balanced gender ratios, primarily consisting of students, enterprise employees, and public servants, characterized by youthfulness, medium-to-high consumption levels, and concentration in first- and second-tier cities.

Reliability and Validity Tests

This study used SPSS software to measure questionnaire scale reliability using Cronbach's Alpha. Composite Reliability (CR) and Average Variance Extracted (AVE) were calculated to measure convergent validity. As shown in , the standardized internal consistency coefficient is 0.950, with each latent variable's internal consistency coefficient greater than 0.7, each latent variable's composite reliability greater than 0.7, and AVE greater than 0.5, indicating good internal consistency and convergent validity. The KMO test coefficient ranges from 0 to 1, with questionnaire validity proportional to the KMO value. shows

the KMO test coefficient is 0.969, indicating good questionnaire validity. The significance of Bartlett's sphericity test approaches 0, rejecting the null hypothesis and demonstrating good questionnaire validity.

The square root of each latent variable's AVE and correlation coefficients can be used for discriminant validity testing. shows the discriminant validity test results, where each latent variable's AVE square root is greater than its correlation coefficients with other variables, indicating good discriminant validity among latent variables.

Model Fit Test

This study conducted structural equation model analysis using AMOS to verify model hypotheses. After fit modification, the model fit indices are shown in . All important fit indices are within recommended acceptable standards, indicating good model fit.

Structural Equation Model Path Analysis

This study conducted path analysis on the research model using AMOS, employing maximum likelihood estimation. Based on the obtained path coefficients and P-values, the model and research hypotheses were validated. Path analysis results show that except for "Compilation Cost \rightarrow Perceived Value" ($P=0.552 > 0.05$) and "Online Word-of-mouth \rightarrow Payment Intention" ($P=0.107 > 0.05$), all other path coefficients between latent variables reached significant levels ($P < 0.05$), verifying most path relationship hypotheses in the model. Specific results are shown in [Figure 2: see original paper].

Results Analysis

Based on TAM, Customer Perceived Value Theory, and using SPSS and AMOS, this study validates hypotheses and model feasibility through path analysis of 571 survey responses, yielding the following conclusions:

Perceived Usefulness and Perceived Value as Direct Factors. Perceived usefulness (path coefficient = 0.487, $P=0.000$) significantly and positively affects online Q&A payment intention, supporting H1. This result is consistent with other scholars' findings [8,10,31-32]. As a new technology product in the internet era, users primarily employ knowledge payment platforms to solve work or learning problems or enhance their skills. Therefore, whether online Q&A platforms can help users acquire knowledge and improve learning performance is key to their payment decisions. Perceived value (path coefficient = 0.548, $P=0.000$) significantly and positively affects payment intention, supporting H2, consistent with Li Wu, Yang Yi, and other scholars [12,17]. The value of paid Q&A platforms lies in providing more professional and accurate information than free models [1]. Only when users feel they have received value for money will they be willing to pay.

Perceived Benefits and Perceived Value. Perceived benefits consist of practical value and hedonic value. Practical value (path coefficient = 0.583, $P=0.000$) significantly and positively affects perceived value, supporting H3. Hedonic value (path coefficient = 0.346, $P=0.000$) significantly and positively affects perceived value, supporting H4. Research shows that economic benefits obtained by questioners can greatly enhance perceived value, making them more willing to participate [12]. Users' core demand for paying online Q&A platforms is acquiring knowledge that brings economic benefits. Therefore, high-quality knowledge can substantially and positively affect perceived value. Additionally, online Q&A platforms typically introduce entertainment features to enhance user pleasure [33]. This study finds that beyond knowledge attributes, online Q&A platforms possess entertainment characteristics that bring emotional satisfaction and pleasure, thereby strengthening perceived value.

Perceived Costs and Perceived Value. Perceived costs consist of economic cost and compilation cost. Economic cost (path coefficient = -0.536, $P=0.004$) significantly and negatively affects perceived value, supporting H5. Users' subconscious association with Q&A platforms remains in the free model, making them sensitive to the economic costs of questioning. Therefore, the paid price of online Q&A platforms serves as a negative indicator for users balancing benefits and sacrifices; excessively high prices negatively affect perceived value. Compilation cost ($P=0.552$) does not significantly affect perceived value, rejecting H6, consistent with Zhao Yuxiang's findings [3]. In today's fast-paced society, questioners primarily use fragmented time to organize questions, which does not require excessive time or energy [34]. This study speculates that after years of development and optimization, existing online Q&A platforms have relatively mature and simple operation processes, and users do not expend additional effort or time searching for answers. Therefore, compilation cost does not negatively affect perceived value.

Community Influence and Payment Intention. Community influence is divided into interpersonal influence and online word-of-mouth. Interpersonal influence (path coefficient = 0.204, $P=0.000$) significantly and positively affects payment intention, supporting H7. High-reputation evaluations from interpersonal relationships can enhance users' trust and security in virtual products [35]. Community attributes are user characteristics, and positive feedback from friends and community organizations drives users' own payment intentions. Online word-of-mouth ($P=0.107$) does not significantly affect payment intention, rejecting H8. Although users review comments before paying, this study infers that compared to online reviews, users trust evaluations from their social circles or community organizations more because these experiences are more authentic and credible. The authenticity of online platform reviews is difficult to guarantee, leading to decreasing user reliance on online comments and thus diminishing the impact of online word-of-mouth on payment intentions.

Mediation Effect Testing

Using AMOS software and the Bootstrap method with 2,000 samples and a 95% confidence interval, this study tests the mediating effects of factors influencing online Q&A platform payment intentions. Path coefficient analysis shows that compilation cost \rightarrow perceived value is not significant, leaving three mediation paths in the model:

Path 1: Practical Value \rightarrow Perceived Value \rightarrow Payment Intention. The confidence interval does not contain 0, indicating significant mediation. The total effect is 0.7033, with direct effect accounting for 59.31% of the effect size, indicating that perceived value plays a partial mediating role between practical value and payment intention. This aligns with existing research, such as Liu Li's [36] finding that perceived value partially mediates between product quality and purchase intention. Practical value not only directly affects payment intention but also indirectly influences it through perceived value. When users pay for knowledge, practicality is their primary consideration, directly affecting payment intention while also influencing their weighing of benefits and sacrifices, thereby indirectly affecting payment intention.

Path 2: Hedonic Value \rightarrow Perceived Value \rightarrow Payment Intention. The confidence interval's upper limit is 0, indicating non-significant mediation. This differs somewhat from existing research on user payment behavior. For instance, He Wenqian [37] found that perceived value partially mediates between hedonic value and payment intention in online music users, primarily because music platforms' main value lies in entertainment attributes, causing users to weigh hedonic value against perceived costs before paying. However, online Q&A platforms emphasize knowledge attributes, so hedonic value does not affect perceived value but instead acts as a separate variable with smaller direct impact on payment intention.

Path 3: Economic Cost \rightarrow Perceived Value \rightarrow Payment Intention. The total and indirect effects' confidence intervals do not contain 0, while the direct effect's lower limit is 0, indicating significant total and indirect effects but non-significant direct effects. Perceived value plays a complete mediating role between economic cost and payment intention, consistent with Li Na's [38] finding that platform perceived value completely mediates between perceived cost and payment intention. The main reason is that knowledge payment is a payment behavior where price is often the key factor for users judging cost-effectiveness; thus, economic cost affects payment intention entirely indirectly through perceived value.

Research Conclusions and Implications

This study examines domestic online Q&A platform users, constructs a theoretical model based on TAM and Perceived Value Theory, collects original data on user payment intentions through questionnaire surveys, and validates hypotheses and model feasibility through structural equation model path analysis,

reaching the following conclusions:

Perceived usefulness and perceived value are the most direct factors influencing online Q&A platform users' payment intentions, while practical value is the most direct factor affecting users' perceived value. The findings further demonstrate that from both technology acceptance and perceived value perspectives, users are most concerned about whether Q&A results can effectively improve their performance and provide substantive help. Although hedonic value can affect payment intentions to some extent, its priority is lower. Interpersonal influence, as an important manifestation of users' community attributes, significantly affects users' own payment intentions. Meanwhile, price is a major obstacle to user payment, while compilation cost does not significantly affect payment intentions, indicating that users focus on payment prices when acquiring knowledge but do not entirely mind the time and effort spent to obtain desired knowledge.

Online Q&A platforms have entered a bottleneck period, primarily due to uneven content quality and failure to accurately grasp user needs. The prerequisite for breakthroughs is thorough research on user needs and behaviors. Based on these findings, this study offers several thoughts and recommendations for online Q&A platform development:

1. **Improve platform reward mechanisms to enhance paid answer quality.** The results show that practical value has the greatest impact on perceived value (0.583). As user consumption habits become more rational, their perception of product practical value increases, making high-quality answers the core user demand and an area requiring continuous cultivation. Platforms should strengthen control over respondents by reviewing their identities and capabilities, raising entry thresholds to ensure consistent high-quality answers. Simultaneously, platforms can enhance rewards for high-quality answers, appropriately rewarding excellent responses when users tip, and regularly conducting ranking activities for quality respondents. This promotes respondents' willingness to answer, improves overall answer quality, and enables paying users to effectively feel that knowledge payment enhances their learning or work performance, thereby strengthening payment intentions.
2. **Standardize platform pricing and provide value-added services.** Economic cost's negative effect on perceived value (-0.536) ranks second. Therefore, platforms should conduct market research to identify target customers' price tolerance ranges for reasonable pricing. For C2C Q&A, platforms should minimize restrictions on tipping prices, granting users more autonomy in setting reward prices based on answer quality, with rights to deduct payments for unsatisfactory answers. Otherwise, the balance between money paid and answer quality cannot be effectively managed, severely affecting user retention. Standardized pricing helps consumers obtain satisfactory answers at matching prices, reducing economic costs, enhancing perceived value, and promoting payment intentions. Additionally, platforms can provide value-added services like answer retrieval

and information push, accurately recommending related answers based on search records to reduce users' time costs and improve experience, fostering users' perception of "value for money."

3. Enhance platform social features and improve user interaction.

Q&A platform users constantly operate under community influence, where interpersonal influence from community organizations positively affects payment intentions (0.204). Users enjoy sharing interesting consumption experiences in their communities and prefer experiential and interactive consumption. Platforms can establish appropriate incentive mechanisms to encourage user sharing and interaction, such as awarding points for participating in answer evaluations or sharing answers to Moments, redeemable for coupons or gifts. This promotes user interaction enthusiasm, fully leverages the interactive functions of knowledge payment platforms, improves user experience, and achieves effective promotion through interpersonal influence between users and their community organizations.

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Note: Figure translations are in progress. See original paper for figures.

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