Model construction and empirical study on mobile commerce user satisfaction

Chaoyi Xu, Providence Alimasi Mongo & Sherif Abdul Ganiyu

ONLINE FIRST

Springer

Springer

Model construction and empirical study on mobile commerce user satisfaction

Chaoyi Xu[1] · Providence Alimasi Mongo[1] · Sherif Abdul Ganiyu[1]

Abstract

Nowadays, China's economic development has entered a new normal and mobile commerce development is very rapid. It is very important for business website operation and mobile business performance to focus on the user satisfaction today. The paper has studied the influencing factor and changing process through building the theoretical model of mobile commerce user satisfaction. From the static perspective the influencing factors of six dimensions are first comprehensively stated and based on the time axis from the dynamic perspective the changing process of user satisfaction is analyzed. The model is tested using data and the hypotheses are supported by the data. The result shows under the new normal mobile commerce user satisfaction is a multidimensional, dynamic variable. The influencing factors are complex and its changing process is to follow the law. The six factors dimensions are reasonable and the changing process is scientific.

Keywords Mobile commerce · User satisfaction · Influencing factor · Changing process

Introduction

At present, in the context of the new normal, the network economy represented by mobile commerce has become an important engine of China's economic development. People use smart tools such as mobile phones to complete shopping, entertainment, marketing, ticket booking, OA, online payment, customer management and other business activities around the clock. The popularity of mobile commerce activities has brought great challenges to our living habits and working methods. However, with the rapid development of business activities, people also gradually began to pay attention to whether its application can meet our expectations, that is, user satisfaction. As for the satisfaction of users of mobile commerce, most scholars at home and abroad focus on the static analysis of the influencing factors at a certain point, instead of systematically studying the changing process of

user satisfaction, influencing factors and their mutual constraint relationship. Therefore, this paper will build a new user satisfaction evaluation model and carry out empirical research. In addition, what we want to emphasize here is that mobile commerce satisfaction especially refers to the satisfaction of users who complete business activities through smart phones, tablets and other mobile smart devices rather than traditional PC.

Research Review

Research on Influencing Factors of Mobile Commerce User Satisfaction

Since Hoppe (1930) and Lewin (1936) studied customer satisfaction, in the traditional manufacturing and service sector, many scholars have discussed the influencing factors of customer satisfaction, and their research conclusions, though not completely consistent, but in general, mainly include the "customer expectations", "brand image" and "perceived quality", "expected value" and "market conditions" and "corporate image" and other factors. More importantly, many scholars (Oliver 1980; Crosby and Stephens 1987) think that user satisfaction should be a complex and multi-dimensional structural variable. In this way, it can be summarized the factors that affect user satisfaction in the traditional environment into

✉ Chaoyi Xu
  3910379@qq.com

  Providence Alimasi Mongo
  providenceal@yahoo.com

  Sherif Abdul Ganiyu
  abdulganiyusherif1@gmail.com

[1] Anhui University of Science & Technology, Huainan, Anhui, China

three aspects: product, transaction and psychological emotion. However, for the new mobile commerce model under the new normal, considering its constantly developing and changing industrial value chain, as well as relatively complex transaction objects, processes and environment, etc. Therefore, on the basis of referring to the classification criteria of factors affecting user satisfaction under the traditional environment, the paper divides the system of factors affecting user satisfaction of mobile commerce into six dimensions: customer behavior (CB), psychological emotion (PE), information technology (IT), product (PR), transaction (TR) and system (SY).

The first dimension is customer behavior, which refers to the personal attributes that influence user satisfaction behavior. As the satisfied party (buyer) of the transaction activity or service, the purchasing behavior of the user will directly affect its satisfaction degree. Many scholars (Lee and Turban 2001; Wen 2019; Hsu et al. 2007) have studied this. The second dimension is psychological emotion. In this paper, it refers to the psychological factors that promote or hinder users' transactions, such as personal preference and expected quality. From previous literatures (Oliver 1980; Oliver 1997) it's learned that scholars once measured users' preferences and emotions based on the emotion model, and the results proved that psychological emotion had an important impact on user satisfaction. The third dimension is information technology. This paper refers to the technical features to ensure the normal transaction of mobile commerce. It mainly discusses the user's experience of business activities from a technical perspective, such as whether the data transmission is efficient and fast, whether the information performance is complete and effective, whether the terminal is safe to use and so on. The influence of information technology on user satisfaction has been studied in depth by the technology acceptance model proposed by Davis (1989) et al. The fourth dimension is the product. In this paper, it refers to commodity characteristics that affect users' transactions, such as brand, quality and perceived value. Moreover, many scholars, such as Kennedy (1983) and Kano et al. (1984), believe that product itself significantly affects user satisfaction. The fifth dimension is the transaction, and this article refers to the relevant attributes to ensure the normal operation of mobile commerce activities, mainly including payment efficient software is convenient, logistics distribution and after-sales service are in good condition. Such as the scholars Mcknight et al. (2002), Lin and Wang (2006), Zhang (2018a) and others have confirmed trading links in business activities play a critical role in the shaping of a user's trust, which directly affects the user satisfaction. The sixth dimension is the system. This paper refers to the coordination and guarantee mechanism to promote the normal development of business activities, such as corporate reputation, third-party certification bodies, and legal authorization and so on. The scholars Woodruff & Gardial (1996) and others have expounded the influence of institutional environments such as corporate image and legal authorization on user satisfaction.

Research on the Changing Process of Mobile Commerce User Satisfaction

At present, many scholars and experts believe that user satisfaction is not only influenced by complex factors, but also constantly changing. In addition, when studying marketing and consumer behavior, scholars usually define user satisfaction with specific transaction satisfaction (STS) and cumulative satisfaction (CS). Specific transaction satisfaction usually refers to the user's evaluation of a particular consumption or service experience. In contrast, cumulative satisfaction is considered to be a process evaluation from the beginning of a business activity to a certain point in time. Usually, at this time, scholars study user satisfaction from a dynamic perspective. When analyzing specific transaction satisfaction and cumulative satisfaction from a dynamic perspective, it can be seen that although they are regarded as different types of user satisfaction, they are more complementary than mutually exclusive. Prior to the twentieth century, specific transaction satisfaction was the focus of many scholars and experts. After the twentieth century, more and more scholars and experts began to focus on cumulative satisfaction. However, they mainly studied the causes and results of these two types of satisfaction, and did not explore the connection between them. Generally speaking, scholars and experts believe that the course of consumer services under the normal conditions mostly includes three interrelated and different stages, namely, pre-transaction, transaction and post-transaction. Similarly, when studying the measurement of value chain performance, T. S. Chan (2005) believes that user satisfaction should include three stages: pre-transaction satisfaction, in-transaction satisfaction and post-transaction satisfaction. It can be seen that user satisfaction is a process that changes with time, which indirectly confirms the feasibility of studying user satisfaction from a dynamic perspective. Later, with the emergence of relationship marketing and CRM, more and more scholars and experts began to pay attention to relationship satisfaction (RS). In conclusion, based on the research results of Giese and Cote (2000), this paper will study the changing process of mobile commerce user satisfaction under the new normal from a dynamic perspective with time as the axis.

Research Model and Hypotheses

Research Model

Based on the above literature analysis, this paper integrated the two perspectives of user satisfaction and proposed a research model of mobile commerce user satisfaction, as shown

in Fig. 1. As it can be seen from the Fig. 1, there are six dimensions of influencing mobile commerce user satisfaction identified from the static perspective in the large rectangular box on the left. And there are three changing processes of mobile commerce user satisfaction identified from the dynamic perspective in the large rectangle on the right. The dynamic perspective mainly studies the changing process of user satisfaction (specific transaction satisfaction → cumulative satisfaction → relationship satisfaction) on the basis of considering the time factor. In reality, there may be a special case that user satisfaction directly changes from specific transaction satisfaction to relationship satisfaction, but this paper does not focus on it. The static perspective involves the factors influencing the satisfaction of mobile commerce users. Through literature review and considering the characteristics of mobile commerce, this paper identifies six dimensions, and each dimension has different degrees of influence on each stage of user satisfaction under the dynamic perspective, and determines the transition between the stages. In the research model, the three types of user satisfaction under the dynamic perspective are restricted by the six dimensions of influencing factors under the static perspective, which reflects the integration of dynamic and static to some extent.

Research Hypothesis

As a static structural variable, user satisfaction is affected by six dimensions including customer behavior, psychological emotion, information technology, product, transaction and system, as shown in Fig. 1. They point to each stage of user satisfaction by arrow, that is, each type of user satisfaction evaluation can be obtained by judging six influencing factors and then summarizing them. However, from a static perspective, the dimensions proposed in this paper are not limited to specific types of user satisfaction, but suitable for any type of user satisfaction. Therefore, we propose the following hypothesis:

H1: Factors such as customer behavior, psychological emotion, information technology, product, transaction and system will have an impact on specific transaction user satisfaction, cumulative user satisfaction and relational user satisfaction.

In addition, for each type of user satisfaction, it can be seen from Fig. 1 that the six influencing factor dimensions all point to them through the arrow. By means of the regression analysis, the regression coefficient of the influencing factor dimension of each user satisfaction can be obtained, that is, the structure weight. However, in terms of the nature of the structure weight, they indicate that the six dimensions have different effects on the satisfaction of each type of the users. Therefore, through these structural weights, we can not only analyze each type of user satisfaction at a deeper level, but also help us identify the importance degree of the individual influencing factor dimension in each type of user satisfaction. It can be seen from Fig. 1 that for each type of user satisfaction, each influencing factor dimension has a structure weight, and the different structure weights indicate that the same influencing factor has different effects on the satisfaction of the three types of users. In a sense, although these three types of user satisfaction are related to each other, they should be considered as different structural variables in essence. Different types of user satisfaction firstly indicate that the users make user satisfaction judgments in different environments, and also indirectly reflect that the users evaluate user satisfaction in different time ranges. In terms of the same influencing factor dimension, different users' judgment criteria are not different, and their corresponding structure weights are necessarily different. In addition, the users generally evaluate user satisfaction from different perspectives based on their experiences. Then, for the same user satisfaction type, the static analysis of six influencing factor dimensions should have different structural weights. However, considering that there are no available research results to support the six influencing factor dimensions proposed in this paper,

Fig. 1 Theoretical model of mobile commerce user satisfaction
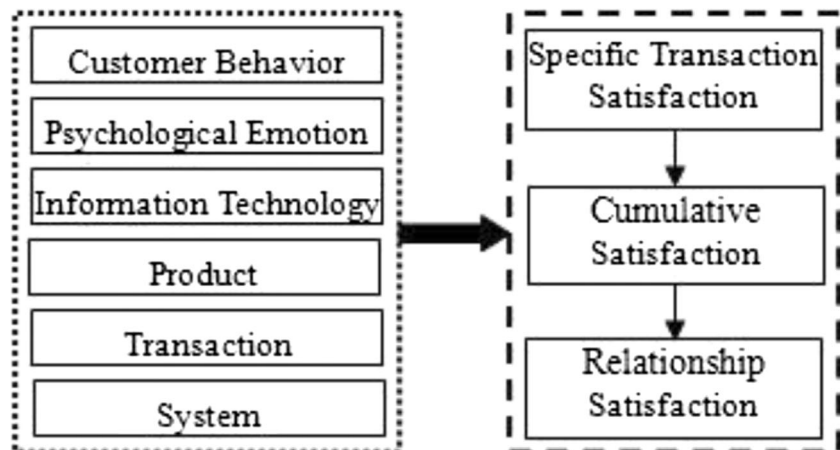
in order to test the structure weight in the above two cases, the paper proposes the following hypothesis:

> H2: In terms of the same influencing factor dimension, its effect (structural weight) on the satisfaction of three types of users should be different.
> H3: In terms of the same type of user satisfaction, the structural weights of its six influencing factors should be different.

Specific transaction satisfaction refers to the user's evaluation of consumption or service process experienced in a specific environment, while cumulative satisfaction refers to the user's evaluation of consumption or service process in a period of time after a certain point in the past. At present, it has become the consensus of academia to study user satisfaction by treating specific transaction satisfaction and cumulative satisfaction as different structural variables (Chan and Chan 2005). For cumulative satisfaction, the users tend to evaluate based on the results and experience of previous consumption services. In fact, every time the users consume and buying the services, they will acquire new knowledge from the process of consumer services. In this way, every time they consume the services, they will constantly accumulate the knowledge and increase their knowledge. Accordingly, their consumption expectation level will also rise accordingly. Generally speaking, cumulative satisfaction is gradually developed and formed on the basis of specific transaction satisfaction. The number of users' specific transactions and the quality of the results directly or indirectly affect the judgment of users' cumulative satisfaction. In other words, cumulative satisfaction is a function of specific transaction satisfaction. Considering the continuous development and change of user satisfaction, their judgment of cumulative satisfaction will change accordingly after each consumption service experience. It is not difficult to see that the cumulative satisfaction at point t on the time axis is the cumulative result of the satisfaction of all specific transactions prior to point t. This study mainly discusses the difference and relationship between specific transaction satisfaction and cumulative satisfaction at time t-1. When studying the relationship between specific transaction satisfaction, cumulative satisfaction and repurchase, Jones and Suh believe that specific transaction satisfaction positively and significantly affects cumulative satisfaction (Jones and Suh 2000). Based on this, the following hypothesis is proposed in this paper:

> H4: The specific transaction satisfaction at t-1 point directly affects the cumulative satisfaction at t point.

Similarly, in essence, the scholars should consider cumulative satisfaction and relational satisfaction as different structural variables. Through the relevant theories and practices of relationship marketing, we know that the establishment of a relationship between consumers and merchants usually needs to go through several stages (Dwyer et al. 1987). Accordingly, both specific transaction satisfaction and cumulative satisfaction are stage results in the process of relationship development. It should be emphasized that the past consumer service experience plays a very important role in the cumulative satisfaction evaluation of the users. In the process of purchasing goods and services for many times, the users can better communicate with the merchants, enhance their relationship with each other, and make them more trust and understand each other. In this way, their relationship will continue to develop and mature. Olsen's research shows that the relationship is the result of continuous accumulation of satisfaction (Olsen 2002). Wang and Head believe that cumulative satisfaction has a positive and significant impact on user relationship motivation (Wang and Head 2017). In addition, when analyzing the relationship between cumulative satisfaction and relationship satisfaction from the perspective of time value, it can be found that the relationship satisfaction at time t is mainly affected by the cumulative satisfaction at time t-1. On the one hand, cumulative satisfaction, as an indispensable stage in the formation and development of relationship satisfaction, has a direct effect on it. In addition, the former cumulative satisfaction will also affect the relationship strength between users and merchants, which indicates that the former cumulative satisfaction can indirectly affect the relationship satisfaction by adjusting the relationship strength between users and merchants. To sum up, it can be concluded that relationship satisfaction is affected by cumulative satisfaction directly and indirectly. Therefore, this paper makes the following assumptions:

> H5: Cumulative satisfaction at t-1 point positively affects the relationship satisfaction at t point.

Research Methods

Questionnaire Design

In this paper, the theoretical model is tested by collecting data from questionnaires. The questionnaire is mainly composed of two parts, one is to study the demographic characteristics of the respondents, and the other is to set the measurement item of structural variables in the theoretical model. In order to ensure the accuracy and reliability of the measurement, Likert five-level scale was used for questionnaire design. The respondents chose 1 (strongly disagree) to 5 (strongly agree) to score relevant questions. The measurement items of all the variables are extracted on the basis of referring to the existing literature, which can effectively guarantee the validity of the content of the questionnaire. The measurement

items of customer behavior, psychological emotion, information technology, product, transaction and system mainly refer to the research of Kim et al. (2004), Xu et al. (2018), Yao (2019), Mu et al. (2018), Lin et al. (2012), Zhen & and Li (2017). The measurement items of specific transaction satisfaction come from Smith & Bolton (2002), Zhang (2018b), Wang & Zhang (2017) and other literatures. The measurement items of cumulative satisfaction come from Fornell (1992), Wang Yuding (2019) and other literatures. The measurement of relationship satisfaction refers to the study of Dwyer et al. (1987), Rust & Oliver (2003), Bian Ruijuan (2018) et al. After designing the questionnaire, scholars and experts in the relevant field will review it and modify it according to their suggestions. Then, ten graduate students were invited to participate in the pre-test of the questionnaire. At the same time, according to their feedback results, some ambiguous problems were also made corresponding corrections.

Data Collection

In this paper, the university students and graduate students are selected as the survey samples. Considering the dynamic changing process of user satisfaction, the data collection is divided into three stages. The period was approximately 1 year (September 2018 to August 2019) and the sample set for each stage was the same. 450 questionnaires were issued at each stage, and only the respondents who responded effectively at all three stages were qualified samples. In order to ensure the objectivity, fairness and accuracy of the survey data, the authors use the following three criteria to judge whether the questionnaire is valid. The answers of the same kind of multiple-choice questions cannot be exactly the same; all the questions must be answered; the respondents use mobile commerce for no less than 1 year. After screening and sorting, a total of 303 valid questionnaires were obtained, and the recovery rate was 67.3%. The sample situation is shown in Table 1.

Empirical Test

Reliability and Validity

In order to test the reliability and validity of the sample data, the authors used the maximum variance rotation method proposed by Hair et al. (1998) for the principal component analysis of the sample data. The KMO (Kaiser-Meyer-Olkin) value of the sample data was 0.872, which was higher than the recommended value of Kaiser (1974) of 0.5, indicating that the collected data met the conditions for the principal component analysis. From the results of principal component analysis, it can be seen that a total of 9 factors were extracted, which explained the variance of 62.1%. In addition, all measurement items

Table 1 Statistical table of sample characteristics ($N = 303$)

Variable	Option	Number	Frequency (%)
sex	male	190	62.7
	female	113	37.3
age	<18	4	1.3
	18–24	267	88.2
	25–30	30	9.9
	>30	2	0.6
Degree of education	Junior college	56	18.5
	Undergraduate	204	67.3
	Postgraduate or above	43	14.2
Usage time (year)	1–3	53	17.5
	3–5	159	52.5
	>5	91	30.0
Mobile operator	China Mobile	125	50.2
	China Unicom	62	20.5
	China Telecom	116	38.3

have large standard load values on their correlation factors and show the characteristics of low cross load, which indicates that their convergent validity and discriminated validity are good.

In order to better test the theoretical model, the authors adopted the two-step method of structural equation model. For the measurement model, the confirmatory factor analysis was used to test the reliability and validity of the measurement term. The results are shown in Table 2. After screening, the authors finally used 29 measurement items to measure 9 potential variables: customer behavior, psychological emotion, information technology, product, transaction, system, specific transaction satisfaction, cumulative satisfaction and relationship satisfaction. In general, Cronbach's alpha value is used by the scholars to evaluate the reliability of each factor in the model, and composite reliability (CR) is taken as an index to measure the internal consistency of each measure item. After the calculation, the authors know that Cronbach's alpha value and CR value of 9 factors were both greater than 0.7, which indicates that the reliability of the measure term was good (Nunally 1978). In addition, all the standard loads were above 0.6 and were significant at the 0.05 level. In addition, it should be noted that after calculating the average variance extracted (AVE) of all the factors, the authors found that their values were all greater than 0.5, which also proved from the side that the convergence validity of the measure term was good. At the same time, after comparing the square root of AVE value of each factor with the correlation coefficient of the same factor, the authors found that the correlation coefficient of each factor was smaller than the corresponding square root of AVE value, which also reflected good discriminated validity.

Table 2 Reliability and validity analysis

Factor	Measurement item	Standard load	T value	AVE	CR	Cronbach's alpha
CB	CB1	0.76	15.53	0.62	0.70	0.85
	CB2	0.71	15.51			
	CB3	0.75	15.69			
PE	PE1	0.72	17.77	0.58	0.79	0.84
	PE2	0.80	16.51			
	PE3	0.75	16.22			
IT	IT1	0.68	15.36	0.55	0.73	0.77
	IT2	0.62	16.59			
	IT3	0.69	15.17			
PR	PR1	0.82	15.33	0.62	0.75	0.81
	PR2	0.76	17.91			
	PR3	0.74	15.24			
TR	TR1	0.81	17.58	0.71	0.82	0.90
	TR2	0.77	17.37			
	TR3	0.73	16.67			
	TR4	0.72	13.71			
SY	SY1	0.76	15.60	0.66	0.72	0.83
	SY2	0.78	13.15			
STS	STS1	0.76	16.94	0.69	0.84	0.80
	STS2	0.76	15.11			
	STS3	0.74	13.43			
CS	CS1	0.71	13.02	0.61	0.71	0.84
	CS2	0.80	14.32			
	CS3	0.76	14.36			
RS	RS1	0.73	15.61	0.65	0.80	0.88
	RS2	0.80	15.86			
	RS3	0.78	16.54			
	RS4	0.83	15.19			
	RS5	0.76	16.73			

Hypothesis Test

For the above model hypothesis, we tested it with LISREL software. Through the analysis of the fitting index results of the structural model in Table 3, we can see that most of the fitting index values are within the allowed recommended value range. Therefore, the fitting degree between the research model we proposed and the sample data is still relatively good.

In order to test the effect of factors such as customer behavior, psychological emotion, information technology,

Table 3 Results of fitting index of structural model

Fitting index	Recom_mended value	Covariance test of influencing factors			Influence factor and user satisfaction path coefficient test	Dynamic visual angle inspection
		Specific transaction satisfaction	Cumulative satisfaction	Relationship satisfaction		
χ/df^2	≤3	1.32	1.56	2.07	2.33	2.97
RMSEA	≤0.08	0.09	0.05	0.08	0.08	0.06
AGFI	≥0.80	0.82	0.83	0.89	0.87	0.91
CFI	≥0.90	0.91	0.92	0.95	0.92	0.96
NFI	≥0.90	0.90	0.91	0.94	0.94	0.97
RFI	≥0.90	0.97	0.92	0.93	0.95	0.95
RNI	≥0.95	0.96	0.97	0.96	0.95	0.96

product, transaction and system on any stage of the dynamic change of user satisfaction, the authors regard the six influencing factor dimensions as equivalent structural variables, which are in parallel relationship. By analyzing the covariance among the six influencing factors in each stage of user satisfaction with LISREL software, the authors found that the covariance between any two structural variables in any stage of user satisfaction was distributed within the range of 0.71–0.90, as shown in Table 4 ($p = 0.05$). Moreover, all fitting index values of the research model also meet the requirements of recommended values, which indicate that the model and data fit well. It can be seen that factors such as customer behavior, psychological emotion, information technology, product, transaction and system will influence each stage of user satisfaction, that is, hypothesis H1 is true.

From Table 5 the results of path coefficients between influencing factor dimensions and each type of user satisfaction, it can be found that structure weight is significantly different between the same dimension and different influencing factors of customer satisfaction in customer satisfaction type, on the other hand, for the same type of user satisfaction, the dimension of each influence factor of the structure weight is not the same, namely the hypothesis H2 and H3 are established.

Through the analysis of Fig. 2, the authors can see that the specific transaction satisfaction positively and significantly affects the cumulative satisfaction ($\beta = 0.63$, $t - value = 15.51$), and the cumulative satisfaction has a very significant influence on the relationship satisfaction ($\beta = 0.77$, $t - value = 16.39$). In addition, the contribution rate of specific transaction satisfaction to the variance of cumulative satisfaction is 47%, and the contribution rate of cumulative satisfaction to the variance of relationship satisfaction is 65%. Thus, H4 and H5 are assumed to be supported.

Table 5 Path coefficients between influencing factor dimensions and each type of user satisfaction

	STS	CS	RS
CB	0.62	0.80	0.83
PE	0.77	0.82	0.65
IT	0.79	0.76	0.81
PR	0.93	0.87	0.83
TR	0.81	0.82	0.90
SY	0.76	0.74	0.78

Conclusion and Revelation

Though many scholars and experts believe that user satisfaction is a multi-dimensional and dynamic structural variable, there is little systematic and comprehensive research on the influencing factors of mobile commerce user satisfaction and its changing process under the new normal. The above research results show that the influencing factors of mobile commerce user satisfaction under the new normal are more complex, but the changing process is regular.

Main Conclusions

First, compared with the traditional environment, the influencing factors of mobile commerce user satisfaction under the new normal are more complex, which are summarized in this paper as customer behavior, psychological emotion,

Table 4 Covariance between influencing factor dimensions

	Specific transaction satisfaction	Cumulative satisfaction	Relationship satisfaction
CB - PE	0.76	0.82	0.78
CB - IT	0.80	0.79	0.82
CB - PR	0.79	0.83	0.86
CB - TR	0.77	0.83	0.79
CB - SY	0.82	0.89	0.85
PE - IT	0.71	0.79	0.83
PE - PR	0.83	0.81	0.89
PE - TR	0.78	0.80	0.90
PE - SY	0.81	0.84	0.73
IT - PR	0.88	0.87	0.83
IT - TR	0.76	0.84	0.82
IT - SY	0.74	0.81	0.77
PR - TR	0.80	0.86	0.83
PR - SY	0.82	0.84	0.80
TR - SY	0.75	0.86	0.86

Fig. 2 Test results of user satisfaction from the dynamic perspective

follows the main line of specific transaction satisfaction → cumulative satisfaction → relationship satisfaction and keeps extending forward. This paper assumes that H4 and H5 exactly confirm the dynamic changing process of mobile commerce user satisfaction the authors proposed. At the same time, it also indicates that specific transaction satisfaction is the basis and premise of evaluating cumulative satisfaction, which has an important influence on the evaluation of relationship satisfaction. In fact, the authors can also study the influence of specific transaction satisfaction on relationship satisfaction through alternative models (adding the relationship line of specific transaction satisfaction and relationship satisfaction on the basis of Fig. 2), but this paper does not focus on the study.

Theoretical and Practical Enlightenment

In theory, this paper on the basis of the literature and theoretical deduction from the static angle proposed the six factors that affect mobile commerce user satisfaction, discussed the three stages of the change process of user satisfaction from the dynamic perspective, made a breakthrough on the static or dynamic perspective in the previous research on user satisfaction, provided some ideas for later research, and enriched the research achievements of customer satisfaction at the same time.

In practice, based on the relevant research conclusions, mobile commerce service providers should not only treat the factors that affect the satisfaction of mobile commerce users comprehensively and scientifically, but also pay more attention to the changing process of the satisfaction of mobile commerce users. From now on, the merchants should provide users with satisfactory products and services every time. At the same time, the merchants should, based on the long-term, improve the accumulated satisfaction of users, establish mutually beneficial relations of cooperation and enhance the satisfaction of relations, so as to gain long-term competitive advantages.

information technology, product, transaction and system. At the same time, hypothesis H1 also verifies that the factors the authors proposed affecting the satisfaction of mobile commerce users are relatively reasonable.

Second, for the same type of user satisfaction, the structural weight coefficients of influencing factors are often different. In a certain stage of specific transaction satisfaction, the weight coefficient of product influencing factor dimension is much larger than that of other influencing factor dimensions. Generally, when users evaluate the process of purchasing a certain product (service), they are most concerned with the quality of the product (service) they have obtained at present, rather than the past and future. In the stage of relationship satisfaction, transaction is the decisive factor that affects the evaluation of relationship satisfaction. This is derived from the essence of relationship satisfaction, which mainly reflects the cooperative and reciprocal relationship between users and mobile commerce service providers. In the process of establishing a long-term relationship, mobile commerce service providers and users communicate with each other through multiple transactions to better understand and recognize each other. However, in terms of cumulative satisfaction, considering the uncertainty of actual consumption times of users in real life, each influencing factor of user satisfaction plays a basically equal role in it, and users tend to evaluate it on the basis of comprehensive balance of six dimensions.

Third, from the dynamic perspective, the satisfaction of mobile commerce users is constantly changing, which usually

Compliance with Ethical Standards

Conflict of Interest No conflicts existing among the co-authors.

Ethical Approval and Informed Consent All the researches have been performed in proper way.

References

Bian, R. J. (2018). *The empirical research on influence factors of customer satisfaction of Mobile Reading*. Nanjing: School of Management, Nanjing University of Posts and Telecommunications.

Chan, F. T. S., & Chan, H. K. (2005). Simulation Modeling for Comparative Evaluation of Supply Chain Management Strategies. *International Journal of Advanced Manufacturing Technology, 25*(9–10), 998–1006.

Crosby, L. A., & Stephens, N. (1987). Effects of relationship marketing on relationship satisfaction, retention and prices in the life insurance industry. *Journal of Marketing Research, 23*(4), 404–411.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Dwyer, F. R., Schurr, P. H., & Oh, S. (1987). Developing buyer-seller relationships. *Journal of Marketing, 51*(2), 11–27.

Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish experience. *Journal of Marketing, 56*(1), 6–21.

Giese, J. L., & Cote, J. A. (2000). Defining Consumer Satisfaction. *The Academy of Marketing Science Review, 1*, 1–24.

Hair, J. F., Anderson, R. E., & Black, W. C. (1998). *Multivariate data analysis with readings*. Prentice Hall: Englewood Cliffs.

Hoppe, E. E. 1930). *Misserfolg, Psicologische Forschung*.

Hsu, C. L., Lu, H. P., & Hsu, H. H. (2007). Adoption of the Mobile internet: An empirical study of multimedia message service (MMS). *OMEGA: International Journal of Management, 35*(6), 715–726.

Jones, M. A., & Suh, J. (2000). Transaction-specific satisfaction and overall satisfaction: An empirical analysis. *The Journal of Services Marketing, 14*(2), 147–159.

Kaiser, H. F. (1974). An index of factorial simplicity psychometrics. *Psychometrika, 39*(1), 31–36.

Kano, N., Seraku, N., Takahashi, F., & Tsuji, S. (1984). Attractive Quality and Must-Be Quality. *The Journal of the Japanese Society for Quality Control, 6*, 39–48.

Kennedy, M. (1983). The adoption and diffusion of new industrial products: A literature review. *European Journal of Marketing, 17*(3), 31–88.

Kim, D. J., Song, Y. I., Braynov, S. B., & Rao, H. R. (2004). A multidimensional trust formation model in B2C E-commerce: A conceptual framework and content analysis of academia/practitioner perspectives. *Decision Support Systems, 34*(2), 87–99.

Lee, M. K. O., & Turban, E. (2001). A trust model for consumer internet shopping. *International Journal of Electronic Commerce, 6*(1), 75–91.

Lewin, K. (1936). *Principles of topological psychology*. New York: Mcgraw Hill.

Lin, H. H., & Wang, Y. S. (2006). An examination of the determinants of customer loyalty in Mobile commerce contexts. *Information & Management, 43*(2), 271–282.

Lin, J. B., Lu, Y. B., & Xu, Y. (2012). Research on user satisfaction and loyalty of Mobile banking. *J Journal of Information Systems, 10*(1), 97–107.

McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information Systems Research, 13*(3), 334–359.

Mu, G. Y., Xu, Q., & Si, X. L. (2018). Influence Factors of Social Advertising Information Dissemination on Trust in Social Network Environment. *Information Sciences, 36*(11), 146–149+157.

Nunally, J. C. (1978). *Psychometric theory*. New York: McGraw-hill.

Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research, 17*, 460–469.

Oliver, R. L. (1997). *Satisfaction: A behavioral perspective on the consumer*. New York: McGraw Hill.

Olsen, S. O. (2002). Comparative evaluation and the relationship between quality, satisfaction, and repurchase loyalty. *Journal of the Academy of Marketing Science, 30*(3), 240–249.

Rust, R., & Oliver, R. L. (2003). *Service quality: Insights and managerial implications from the frontier service quality :New directions in theory and practice*. Thousand Oaks: Sage Publicaitons.

Smith, A. K., & Bolton, R. N. (2002). The effect of customers' emotional responses to service failures on their recovery effort evaluations and satisfaction judgments. *Journal of the Academy of Marketing Science, 30*(1), 5–23.

Wang, F., & Head, M. (2017). How can the web help Bulid customer relationship? An empirical study on E-tailing. *Information & Management, 44*(2), 115–129.

Wang, Y. D., & Li, X. D. (2019). Research on the Impact of Network Effect and User Satisfaction on User Loyalty of Business Platform. *Journal of Fujian Institute of Financial Administrators, 1*, 41–49.

Wang, X. F., & Zhang, H. X. (2017). Destruction or rebirth: Communication strategy and consumer trust reconstruction in an industry-wide crisis. *Chinese Journal of Management, 14*(9), 1362–1373.

Wen, X. T. (2019). *Analysis of factors affecting user trust behavior of cross-border E-commerce based on UGC*. Beijing: Beijing University of Posts and Telecommunications.

Woodruff, R. B., & Gardial, S. F. (1996). *Know your customer: New approaches to understanding customer value and satisfaction*. Cambridge: Blackwell.

Xu, J. X., Xu, Y. F., & Liu, Q. Y. (2018). Analysis on influencing factors of college Students' consumption Trust in the Context of Mobile E-commerce. *Journal of Hubei University of Economics (Humanities and Social Science), 15*(11), 32–35.

Yao, G. A. (2019). The Influence of Experience and Corporate Reputation on Consumers' Trust in E-Commerce Companies. *Soft Science, 33*(7), 47–50+57.

Zhang, P. (2018a). *S T Pan*, "corporate social responsibility of the fresh food E-commerce and consumers' trust repair willingness". *Journal of South China Agricultural University (Social Science Edition), 17*(6), 77–91.

Zhang, H. W. (2018b). *The study on user satisfaction of Chinese cross-border E-commerce platform*. Jilin: School of Business, Jilin University.

Zhen, D. J., & Li, M. Y. (2017). Research on the influence of emotions of using Mobile library on users' satisfaction. *Information Studies: Theory & Application, 40*(5), 50–55.