

Summer 7-5-2020

Mobile O2O Commerce Platform Quality: Scale Development and Validation

Lin Liu

School of Management Science and Engineering, Anhui University of Technology, China; Research Centre of Decision and Behavior Science, Anhui University of Technology, China

Fang Wang

School of business, Anhui University of Technology, China; Research Centre of Decision and Behavior Science, Anhui University of Technology, China, 1361295794@qq.com

Haoyue Xu

School of business, Anhui University of Technology, China; Research Centre of Decision and Behavior Science, Anhui University of Technology, China

Jinnan Wu

School of business, Anhui University of Technology, China; Research Centre of Decision and Behavior Science, Anhui University of Technology, China

Follow this and additional works at: <https://aisel.aisnet.org/whiceb2020>

Recommended Citation

Liu, Lin; Wang, Fang; Xu, Haoyue; and Wu, Jinnan, "Mobile O2O Commerce Platform Quality: Scale Development and Validation" (2020). *WHICEB 2020 Proceedings*. 56.
<https://aisel.aisnet.org/whiceb2020/56>

This material is brought to you by the Wuhan International Conference on e-Business at AIS Electronic Library (AISeL). It has been accepted for inclusion in WHICEB 2020 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Mobile O2O Commerce Platform Quality: Scale Development and Validation

Lin Liu^{1,3}, Fang Wang^{2,3*}, Haoyue Xu^{2,3}, Jinnan Wu^{2,3}

¹School of Management Science and Engineering, Anhui University of Technology, China

²School of business, Anhui University of Technology, China

³Research Centre of Decision and Behavior Science, Anhui University of Technology, China

Abstract: The *Drainage effect* of mobile O2O commerce is closely related to the platform quality. However, to date there has been no measure specifically designed to measure mobile O2O commerce platform quality (MCPQ). The purpose of this study is to develop a scale for measuring MCPQ based on the IS success model. Exploratory factor analysis (study 1) and confirmatory factor analysis (study 2) were performed on 613 samples. Results showed that the scale of MCPQ is a reliable and valid instrument, and that mobile O2O commerce platform quality is a multi-dimensional construct composed of five dimensions, i.e., interface design, operational efficiency, content quality, demand responsiveness, and privacy protection.

Keywords: mobile O2O commerce, platform quality, service quality, IS success model, scale development

1. INTRODUCTION

Mobile devices have radically changed people's daily communication, learning, working and social intercourse models. The new business model represented by mobile commerce has imperceptibly enabled people to have a chance to enjoy different life experiences. Among several different business platforms, mobile O2O commerce is a new e-commerce model emerging after B2B, B2C and C2C^[1], which has been developing vigorously in China and the world in recent years. O2O commerce attracts online users by providing information, services, and booking discounts, afterward, users receive products or experience services through the traditional offline approach. The key to this model is how to turn online users into offline consumers of cooperative merchants through the display of mobile commerce platforms, thus achieving the *drainage* effect^[1]. Therefore, users' perception of service quality of mobile commerce is crucial. However, according to a survey by the Chinese Internet Data and Information Center, among mobile O2O commerce users, 43.0% of them think the responsiveness is too slow; 40.2% of them complain about the inaccurate communication; 37.4% of them are obsessed by system errors. This unpleasant user experience reflects the service quality problems in mobile commerce^[2-4]. The improvement of quality cannot be separated from the scale of evaluation. Hence it is very necessary to explore the measurement system of mobile O2O commerce service quality from a theoretical perspective. Given the particularity of the research situation, mobile O2O commerce service quality normally considers from two aspects: online and offline, but after the practical investigation, we realized that some offline businesses only act as O2O operators cooperation units, not all of those business regulated by O2O operators. Therefore, this study will focus on online service quality, namely the mobile O2O commerce platform quality.

Existing researches is lack of the research results of developing and testing the quality scale of mobile O2O commerce platform through standardized procedures, which leads to people's confusion about the platform quality, impedes the development of theoretical research and management practice. The purpose of this study is to compile the mobile O2O commerce platform quality (MCPQ) scale through standardized programs. After sorting out and integrating relevant studies, we found that no comprehensive theoretical framework has been

* Corresponding author. Email: 1361295794@qq.com (Fang Wang)

developed to measure mobile O2O commerce platform quality, and scholars have a significantly different understanding on the dimensions and levels of mobile or e-commerce service quality^[3, 5-7]. In this regard, based on the IS success model, this study attempts to identify the theoretical structure of MCPQ and develop a scale for assessing MCPQ.

2 THEORETICAL BACKGROUND

2.1 Mobile O2O commerce

By cooperating with offline merchants, O2O operators provide mobile users with information, discounts, orders, and other services, thus transforming online users into offline consumers. Mobile O2O commerce has specific advantages, including accurate positioning of consumer groups, traceable transaction processes, reduced logistics costs and promotion of localized industry development; Achieve sustainable revenue growth by providing value-added services to attract long-term customers^[1]. O2O commerce usually focuses on the life service field, and the inherent location correlation in the life service field determines that mobile terminals are more suitable for the development of O2O commerce. The portability of mobile phones is consistent with the real-time demands of users' daily life. The smartphone has characteristics combined portability, location traceability and identity uniqueness of mobile terminals; they are utilized to facilitate users to search and find the required services at any time.

2.2 Mobile commerce service quality

Service quality of mobile commerce is defined as the overall performance that reflects various service links and final service effect in the process of mobile e-commerce. It is the comprehensive perception and direct experience of customers. Based on the SERVQUAL model, Kar et al. applied these five dimensions (reliability, responsiveness, user interface, trust, and customization) to assess the quality of service in unstable mobile environments, and then puts forward some design methods of service quality to solve the unstable environment problem^[8]. Huang proposed a multidimensional model of M-S-QUAL^[3], the construction concluded with five factors (contact, responsiveness, fulfillment, privacy, and efficiency) for the supporting services in the process of virtual product shopping and four factors (contact, responsiveness, fulfillment, and efficiency) for the supporting services in the process of physical product shopping. Based on the uniqueness of mobile commerce, Zhang et al.^[9] proposed a three-tier model for measuring mobile service quality, which has three main dimensions: (interaction quality, environmental quality, and result quality) and ten sub-dimensions (attitude, expertise, problem-solving, information, equipment, design, location, punctuality, visibility, and rejection values). Choi extracted six factors concerning mobile service quality: network coverage, mobile device, value-added services, billing system, convenience, and price structure. Lu et al.^[10] used mobile brokerage services as an example and proposed an instrument for mobile service quality measurement. These researchers identified three mobile service quality factors that customers perceive when making use of such brokerage services, namely interaction quality, environmental quality, and outcome quality. With the continuous development of information technology, the service contents and methods of all walks of life have changed a lot, website interface design, operational efficiency, privacy protection, information content, and system quality have also become high-frequency terms in the field of information system service quality measurement^[5-7]. It can be found that the multi-dimensional and multi-level measurement method could better describe the complexity of users' perceived behavior process. It also reflects the service quality measurement standards of different industries. In summary, researchers have not reached a consensus on the dimensions contained in the service quality of mobile commerce. This study believes that the academic community ignores the difference between mobile service quality and mobile platform quality. Therefore, this study focuses on the quality of mobile O2O commerce platforms. Based on the IS success model, we start from the three dimensions (i.e.,

system quality, information quality, and service quality), and develop the mobile commerce platform quality scale in the O2O context.

2.3 IS-Success Model

The IS success model was first proposed by DeLone and McLean. In 2003, DeLone and Mclean revised the existing successful model of information systems, with the core of the modification being the inclusion of quality of service in the important reference dimension of information systems themselves^[11]. Since users are also consumers, they believe that the quality of service is exceeding important in the e-commerce environment, providing high-quality service could bring more consumers and higher sales. Since then, the information system (IS) success model^[11] considers three dimensions of system quality, information quality, and service quality has been widely used and extended to measure the success of e-commerce systems^[12]. O2O mobile commerce is a typical mobile commerce information system. This study takes three dimensions, namely system quality, information quality, and service quality, as the theoretical framework to develop the MCPQ scale.

3 SCALE DEVELOPMENT

3.1 Conceptualization and developing a preliminary scale

Mobile O2O commerce is carried out around the transaction platform, and a well-designed trading platform can not only facilitate users to obtain information about products and services they need, reduce searching time, but also establish their preference for the platform^[13]. In this study, platform quality is defined as users' perceived efficiency and convenience of O2O application, as well as their satisfaction with APP visual experience and content presentation. Based on the theoretical framework of the IS success model, the initial scale was determined according to the frequency of key indicators and the characteristics of MCPQ. In this study, interface design and operational efficiency are two dimensions for reflecting system quality; information quality usually appears as content quality; responsiveness and privacy protection occur most frequently in service quality dimension. The following sections will respectively elaborate on the subscales of each structural dimension and its measure items in this study.

3.1.1 Subscale of information quality

Information quality refers to the applicability of the information to users and the degree to which it meets their specific needs. Based on a large number of informational system research literature, usefulness is considered as one of the important antecedents for the adoption of information technology. It refers to the extent to which information is useful to users and meets their needs, reflected in the reliability, accuracy, relevance, and matching of information. In the Internet era, the value of information is closely related to its timeliness, and no matter information is updated in time is also an important indicator to consider the quality of information. With the development of content recommendation technology in the era of big data, it is also crucial for mobile O2O commerce to accurately match personalized information for users. This study uses six items to measure content quality according to Zhou's scale^[7], for example, "The information provided by the mobile APP is easy to understand".

3.1.2 Subscale of system quality

Zhou pointed out in his study that a high level of system quality should have a reliable system, effective navigation and a clear layout of the interface^[14]. Applications with easy-to-navigate interfaces are seen by users as highly efficient and help users build trust in the process. Chow (2004) et al. believed that higher response speed, a scientific navigation design system and a friendly user terminal experience would help promote the ordering process of users. In this study, we selected interface design and operational efficiency as attribute dimensions of system quality, both of which have been highly cited in the literature on mobile commerce and have been verified to be highly correlated with information system quality^[3, 15]. Adapted from Huang^[3] and

Hoehle ^[15], six items were used to assess interface design, for example, "the display effect of the mobile APP interface is very good". The operational efficiency was measured with four items, for example, "this mobile APP allows me to load the web page quickly".

3.1.3 Subscale of service quality

This study focuses on the measurement of service quality indicators in terms of the E-S-QUAL, E-RECS-QUAL, and mobile-service-quality model ^[3]. Three dimensions of demand responsiveness, contact and privacy protection were determined. In this study, three items were used to assess demand responsiveness, for example, "the service provider provides convenient options for my return and exchange". Contact was measured with five items, for example, "the service provider arranges the personnel of the service to help solve the problem". The privacy protection assessed with three items, for example, "the service provider can effectively protect my personal privacy information".

3.2 Pretesting

A pretest questionnaire survey was administered to ensure the quality of our scale instrument. During the test, a total of 60 questionnaires were issued, and 54 valid questionnaires were recovered. Statistical analysis was conducted on the questionnaire results, and the test results were basically in line with expectations. Ten randomly selected subjects were interviewed by our researchers. During the interview, most of the subjects expressed that the questionnaire was readable and could be completed smoothly, but some of them could not understand a few nouns clearly. Combined with questionnaire analysis and interview results, in this study, some measurement items were modified to ensure the content validity of the measurement scale, and the expressions of some items were adjusted slightly to minimize ambiguity, ensure the readability and accuracy of the questionnaire. After repeated discussion, trial filling and modification, a total of 27 measurement scales were finally compiled in the officially released questionnaire, including two dimensions of system quality (operation efficiency and interface design). Three dimensions of quality of service (contact, demand responsiveness, and privacy protection) and one dimension of information quality (content quality). Exploratory factor analysis and confirmatory factor analysis are performed on the collected data in two studies.

3.3 Study 1: Initial Administration

3.3.1 Descriptive statistics of the sample

Through a professional online questionnaire survey platform (www.wjx.cn), we conducted an electronic survey. To study questionnaire for college students and a dissemination group centered on this group, it took one week to collect 235 questionnaires, excluding 23 invalid ones and 212 valid ones left. Among the effective samples, male students account for 53.3%. The age distribution was mainly concentrated in 20~29 years old (80.66%). The disposable monthly income of the sample population was distributed at different consumption levels, with less than 1000 yuan accounting for 41.04%, occupations are found in all walks of life, students account for 48.58% of the total. The samples in this stage are used for exploratory factor analysis.

3.3.2 Exploratory factor analysis

SPSS17.0 software was used to conduct exploratory factor analysis on 27 questions, and the statistical results showed that the KMO value was 0.897. Bartlett's sphericity test ($P < 0.001$) showed that exploratory factor analysis was appropriate. Then, the Principal component analysis and Promax oblique rotation method was used to obtain the factor loading matrix. In the process of analysis, items that meet one of the following conditions were deleted: (1) the common degree is less than 0.5; (2) factor loading is less than 0.6; (3) a span loading exceeds 0.3^[16]. After several iterations of principal component analysis, it has been found that there are five factors with the eigenvalue greater than 1. Since the two-factor loadings of "demand responsiveness" and "connection" are close to each other, they belong to one dimension in terms of a theoretical construct, so the two factors are combined and represented by "demand responsiveness". The factor loadings of two other items were

Table 1 Exploratory factor analysis results

Items	Communalities	Interface Design	Demand Responsiveness	Content Quality	Privacy Protection	Operational Efficiency
The service provider handles customer complaints in a friendly manner.	0.551	-0.049	0.73	0.063	0.117	-0.1
The service provider will arrange customer service representatives to solve problems.	0.581	-0.199	0.779	0.202	-0.087	0.021
The service provider can ensure consistent advice from customer service representatives.	0.522	-0.21	0.771	0.153	-0.122	0.035
The service provider provides me with convenient options for returning items.	0.591	0.141	0.71	-0.107	-0.008	0.055
The service provider handles product returns well.	0.697	0.205	0.77	-0.166	0.012	0.028
The service provider offers a meaningful guarantee.	0.648	0.192	0.655	-0.103	0.13	0.032
The APP loads its pages quickly.	0.651	0.034	0.054	-0.009	0.076	0.729
This APP makes it easy to find what I need.	0.843	-0.006	-0.024	0.006	-0.017	0.938
The APP enables me to complete a transaction quickly.	0.682	-0.034	0.06	0.02	-0.048	0.812
The service provider does not share my personal information with other sites.	0.891	-0.076	-0.005	0.04	0.972	-0.055
The service provider protects information about my web-shopping behavior.	0.858	0.045	-0.053	-0.005	0.952	-0.032
The service provider protects my credit card information.	0.753	-0.052	0.046	0.032	0.798	0.109
In general, the interface of the mobile APP is designed well.	0.662	0.698	0.124	0.078	-0.014	-0.008
I like the graphics displayed on the interface of the mobile APP.	0.773	0.856	0.057	-0.001	-0.013	-0.006
The APP has very good user interface.	0.651	0.823	-0.031	-0.062	-0.02	0.099
I appreciate the overall design of the APP.	0.64	0.859	-0.064	-0.064	0.057	-0.01
I think the APP is well designed.	0.644	0.689	-0.101	0.278	-0.05	-0.086
I am very satisfied with the input mechanisms of the APP.	0.615	0.728	-0.044	0.148	-0.082	-0.02
The information provided by the APP is accurate.	0.671	0.057	-0.009	0.702	0.019	0.134
The information provided by the APP could satisfy my needs.	0.65	0.156	-0.119	0.61	0.042	0.216
There is no out-of-date information on the APP.	0.656	-0.016	0.057	0.791	0.019	-0.006
The information provided by the APP is personalized.	0.5	0.099	0.055	0.672	-0.008	-0.124
This APP provides real-time information.	0.657	0.225	0.122	0.611	0.047	-0.093
Eigenvalue		9.564	2.971	1.733	1.518	1.155
Cumulative % of variance		41.583	54.5	62.036	68.637	73.66

deleted because they were less than 0.6, and the remaining 25 items were factor structures with good discriminability. Next, to further explore the potential factor structure, Principal Axis Factoring and Promax rotation were applied to these 25 questions [16]. Based on the 0.6/0.3 item retention principle, two more items were deleted. As shown in Table 1, the remaining 23 questions were well distributed among the five factors of demand responsiveness, operation efficiency, privacy protection, interface design, and content quality, explaining a total of 73.66% variance.

3.4 Study 2: Scale Validation

3.4.1 Descriptive statistics of the sample

In the second study, questionnaires were collected for two weeks. To ensure the questionnaires could cover target samples as much as possible, samples were collected by random and snowball methods. A total of 486 samples were collected, of which 401 were valid questionnaires, and the effective rate was 82.5%. The sample distribution was as follows: the ratio of male to female was almost the same (male: 45.89%, female: 54.11%). The age distribution was mainly between 20 and 39 years old (92.27%). The samples have different distributions at different consumption levels; education background is mainly undergraduate (80.8%). The valid samples cover more than a dozen different professions, including IT, government, finance, healthcare, construction, retail, education, advertising, manufacturing, and logistics. Therefore the influence of industry attributes on research results can be minimized.

3.4.2 Confirmatory factor analysis

The 401 samples were used to test the fitting indices of the measurement model obtained by exploratory factor analysis to the actual observed data. The AMOS17.0 software was used to perform confirmatory factor analysis by using maximum likelihood estimation to test the structural validity of the scale. Test the difference between the CFA model after the original item and the deleted item, if the Chi-square Difference is significant

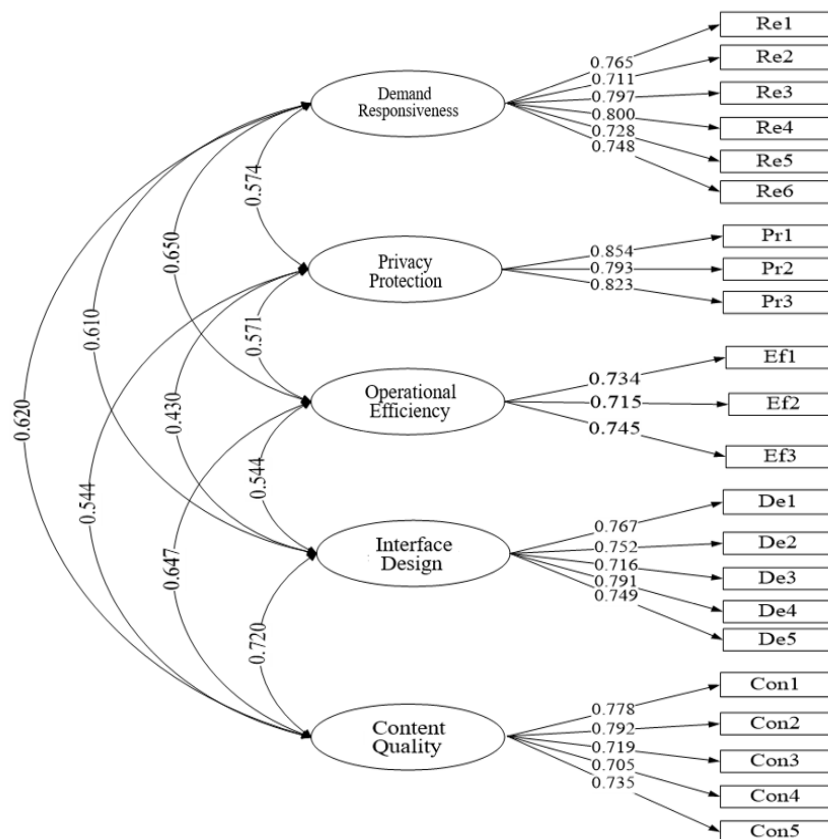


Figure 1 Results for the measurement model.

and the AGFI increases, the deleted item is considered to have a better fitting result. Repeat the process until: (1) the Chi-square test has no significant difference (2) the AGFI does not increase. It was found that the first item of the interface design was deleted and the fitting result was better. Finally, 22 items were retained, the fitting result of the final model is $\chi^2=353.272$ (df=198), approximate root mean square error RMSEA = 0.044, residual root mean square RMR=0.022, the goodness of fit index GFI=0.926, revised standard fitting index IFI=0.970, comparison of fitting index CFI=0.969 (recommended threshold value of GFI, AGFI, NNFI and CFI ≥ 0.90 , the acceptable threshold level of SRMR and RMSEA ≤ 0.08). It indicates that the fitting degree between the data and the measurement model is excellent^[17]. The confirmatory factor analysis results of the model are shown in Figure 1. Besides, Cronbach α was used to measure the reliability of the scale. According to Nunnally^[18], a coefficient greater than 0.7 indicates a high consistency or stability of the evaluation results. The reliability analysis results showed that the Cronbach α coefficient of the five factors was between 0.885 and 0.932, all of which were greater than 0.7, indicating that the scale had high reliability.

3.4.3 Convergent validity

The convergence validity was tested by standardized factor loading and average variance extraction (AVE). According to the results of the first-order five-factor model, as shown in Table 2, the standard factor load values of all observed variables are higher than the threshold value of 0.5, in addition, AVE of all potential variables was greater than 0.5, and composite reliability values were between 0.775 and 0.891, all higher than 0.7^[18]. The above results show that the five subscales of mobile quality of service have preferable convergent validity.

Table 2 Convergence validity test

Factor	Items	Factor Loadings	AVE	C. R
Demand Responsiveness	DR1~DR6	0.711~0.800	0.576	0.891
Operational Efficiency	OE1~OE3	0.715~0.745	0.535	0.775
Privacy Protection	PP1 PP3	0.793 ~0.854	0.679	0.864
Interface Design	ID1~ID5	0.716~0.791	0.571	0.869
Content Quality	CQ1~CQ5	0.705~0.792	0.557	0.863

3.4.4 Discriminant validity

The discriminant validity of the scale was tested by comparing the square root of AVE with the correlation coefficient between variables. The discriminant validity of the scale was tested by comparing the square root of AVE with the correlation coefficient between variables. The results, shown in Table 3, show that the square root of AVE of each factor is greater than the correlation coefficient of corresponding factors, indicating that the scale has a preferable discriminative validity.

Table 3 Discriminant validity test

Variable	Mean	SD					
Demand Responsiveness	3.918	0.770	0.724				
Operational Efficiency	4.067	0.691	0.650**	0.731			
Privacy Protection	4.015	0.792	0.574**	0.571**	0.824		
Interface Design	3.988	0.685	0.610**	0.544**	0.430**	0.756	
Content Quality	4.048	0.674	0.620**	0.647**	0.544**	0.720**	0.746

4 DISCUSSION

This study empirically analyzed the theoretical structure of MCPQ and developed its scales, and found that MCPQ is composed of system quality, service quality, and information quality. System quality is reflected by the interface design and operation efficiency of O2O platform. Service quality is measured by two dimensions: privacy protection and demand responsiveness. Information quality is reflected by content quality. Exploratory factor analysis and confirmatory factor analysis showed that the theoretical structure of the scale fits the actual data well.

Efficiency means the site of APP responds quickly and easy to use. Interface design refers to the user's overall perception of the visual presentation and interactive experience of the mobile APP interface. Zhou^[14] pointed out in his study that the system quality should have a reliable system, effective navigation and clear layout of the interface, applications with easy-to-navigate interfaces are seen as efficient and help users build trust in their use. Obviously, a system that is easy to use and navigate efficiently results in a completely different buyer/seller relationship. The quality of content depends on the availability of timely, accurate, and comprehensive data, and the relevance and usefulness of the information conveyed to the user. Mobile O2O is characterized by real-time, mobility and location correlation; its significant advantage is: it can carry out a series of services to users based on their personal information, such as providing products and pushing personalized services, so as to obtain greater benefits^[19]. The definition of privacy is the degree to which customers perceive the site to be safe and the extent to which their personal information is protected. Mobile O2O service providers can provide users with products and push personalized services based on their personal information. However, for mobile commerce users, they are also faced with problems such as improper collection, processing and use of personal privacy information. Many studies have shown that perceived privacy protection can significantly affect users' attitudes and consumption behaviors^[3]. Responsiveness means the effectiveness of the site's problem-handling process, return policy as well as the availability of telephone assistance and online representatives. Whether service providers can timely feedback and effectively solve users' relevant needs (return, exchange consultation ,and operation) will affect users' satisfaction and loyalty^[20, 21].

Existing researches on the quality measurement of the mobile O2O platform are quite limited. Previous studies mainly focused on the service quality assessment model in the field of mobile commerce^[3]. Discussions on tourism, mobile library, and other situations, as well as the research on the service quality of a certain type of mobile commerce are characterized by functions^[2, 12]. Based on the successful model of the information system, this study established the theoretical structure and measurement system of MCPQ, narrowed the gap between the existing theoretical research and management practice, and provided practical tools for further research of the O2O industry.

This study also has certain limitations. Although the samples cover different ages and occupations, they are all from China. Considering cultural differences, samples from different countries should be collected in the future to further verify the theoretical model to enhance the robustness and universality of the model prediction results. The research on mobile O2O commerce should not only focus on mobile APP, because many users rely on small programs as the platform entrance when using O2O services. There are some differences between the O2O platform and APP itself through small programs, so small programs can be studied in the future.

ACKNOWLEDGEMENT

This research was supported by the National Natural Science Foundation of China [grant numbers 71371013], the Humanity and Social Science Major Foundation of Education Committee of Anhui province [grant numbers SK2019ZD07], and the Natural Science Foundation of Anhui Province [grant numbers

1908085MG238 and 1908085QG301].

REFERENCES

- [1] Chia-Chen Chen, Kuo-Lun Hsiao, Hsieh C-H. (2019). Understanding usage transfer behavior of two way O2O services. *Computers in Human Behavior*, 100: 184-191.
- [2] Heo J Y, Kim K J. (2017). Development of a scale to measure the quality of mobile location-based services. *Service Business*, 11: 1-19.
- [3] Huang E Y, Lin S W, Fan Y C. (2015). M-S-QUAL: Mobile service quality measurement. *Electronic Commerce Research & Applications*, 14(2): 126-142.
- [4] Parasuraman A, Zeithaml V A, Malhotra A. (2005). E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research*, 7(3): 213-233.
- [5] Blut M. (2016). E-Service Quality: Development of a Hierarchical Model. *Journal of Retailing*, 92(4): 500-517.
- [6] Kaatz C. (2020). Retail in my pocket– replicating and extending the construct of service quality into the mobile commerce context. *Journal of Retailing and Consumer Services*, In press.
- [7] Zhou R, Wang X, Shi Y, et al. (2019). Measuring e-service quality and its importance to customer satisfaction and loyalty: an empirical study in a telecom setting. *Electronic Commerce Research*, 19: 477-499.
- [8] Kar E V D, Muniafu S, Wang Y. (2006). Mobile services used in unstable environments: design requirements based on three case studies. *International Conference on Electronic Commerce*, 302-308.
- [9] Zhang L. (2009). Multi-dimensional and Multi-level Model for Mobile Service Quality Measurement. *Chinese Journal of Management*, 6(6): 722-728.
- [10] Lu Y, Zhang L, Wang B. (2009). A multidimensional and hierarchical model of mobile service quality. *Electronic Commerce Research & Applications*, 8(5): 228-240.
- [11] DeLone W H, Mclean E R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, 19(4): 9-30.
- [12] Sura S, Ahn J. (2019). The effects of service quality determinants on social networking site-based commerce: the Malaysian customers' perspective. *Total Quality Management & Business Excellence*, 30(13-14): 1480-1494.
- [13] Cai Shaohan, Jun M. (2003). Internet users's perceptions of online service quality: a comparison of online buyers and information searchers *Managing Service Quality*, 13(6): 504-519.
- [14] Tao Z. (2011). Examining the critical success factors of mobile website adoption. *Online Information Review*, 35(4): 636-652.
- [15] Hartmut Hoehle, Venkatesh V. (2015). Mobile application usability: Conceptualization and instrument development. *MIS Quarterly*, 39(2): 435-472.
- [16] Matsunaga M. (2011). How to factor-analyze your data right: do's, don'ts, and how-to's. *International Journal of Psychological Research*, 3(1): 97-110.
- [17] Hu L T, Bentler, P.M. (1999). Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6: 1-55.
- [18] Nunnally J C. (1994) *Psychometric theory*. New York
- [19] Zhang R, Chen J Q, Lee C J. (2013). Mobile Commerce and Consumer Privacy Concerns. *Data Processor for Better Business Education*, 53(4): 31-38.
- [20] Cambra-Fierro J, Melero-Polo I, Sese J. (2015). Does the nature of the relationship really matter? An analysis of the roles of loyalty and involvement in service recovery processes. *Service Business*, 9(2): 297-320.
- [21] Chao C M, Cheng B W. (2017). Does service recovery affect satisfaction and loyalty? An empirical study of medical device suppliers. *Total Quality Management & Business Excellence*, (1): 1-17.