



# An Analysis of Mobile APP Evaluation Dimension and Measurement based on User Perspective

Manhui Huang<sup>1\*</sup> and Ye Zhu<sup>2</sup>

<sup>1</sup> Research Institute of Innovation Competitiveness of Guangdong, Hong Kong and Macao Bay, Guangdong University of Finance and Economics, Guangzhou 510320, China

<sup>2</sup> Information Science School, Guangdong University of Finance and Economics, Guangzhou 510320, China

\*huangmanhui@126.com

**Abstract.** APP evaluation based on user perspective has been paid lots of attention in the existing research. This paper analyzes the existing research on mobile APP evaluation based on user perspective, summarizes the relevant APP evaluation dimensions and measurements, analyzes the logical relationships among the dimensions, and proposes an APP evaluation analysis framework based on user perspective. Based on process logic, the relevant evaluation dimensions are divided into four stages: APP acquisition, multidimensional APP use experience, users' overall psychological judgment on APP, and users' continuous APP use. Among the four stages, APP acquisition is the premise of user experience, and user experience affects the overall psychological judgment, while users' psychological judgment affects their continuous APP use. The results show that users' APP use experience includes seven dimensions: functional experience, information content experience, aesthetic experience, service experience, technical performance experience, information security experience, and marketing strategy experience. The research results imply that the successful application of mobile APP is a systematic project, which requires multidimensional optimization based on the user perspective to obtain sustainable competitive advantages.

**Keywords:** Mobile APP, Continuous APP Use, APP Use Experience, APP User, Overall Psychological Judgment.

## 1 Introduction

The successful application of an APP depends on the continuous use of its users. User satisfaction is a key determinant of the continuous use of the APP, and users' experience predicts users' satisfaction[1, 2]. How to improve the experience and satisfaction of APP users and promote the continuous use of APP has become a key issue to ensure the successful application of APP. In view of this, this paper intends to sort out the research on mobile APP evaluation, summarize the dimensions of APP evaluation based on the user perspective, analyze the logical relationship between the dimensions,

and propose an APP evaluation and analysis framework based on the user perspective to provide theoretical basis for relevant research and implications for practice.

## **2 Mobile APP Evaluation based on User Perspective**

As the prerequisite for users to use an APP is to have the conditions for the use of the APP, in view of this, this paper divides the mobile APP evaluation based on the user perspective into four stages according to the logic of time: APP acquisition, multidimensional APP use experience, users' overall psychological judgment of the APP, and users' continuous APP use. The basic logic is as follows: APP acquisition is the premise of APP use experience, and users' APP use experience affects their overall psychological judgment of the APP, and users' psychological judgment affects their continuous APP use.

### **2.1 APP Acquisition**

Obtaining and installing an APP is a prerequisite for users' APP use experience. The cost of users' access to apps will affect users' overall evaluation of apps, which is an important dimension of APP evaluation based on users' perspective. The main evaluation dimensions or indicators include accessibility, compatibility, configuration requirements, storage, etc. For example, in the context of mobile apps of foreign database publishers, by using the method of user review content analysis, the research results show that price rationality is an important dimension of APP evaluation before user experience [3]. In the context of mobile learning apps, the analytic hierarchy process (AHP) is adopted, the research results show that accessibility is an important dimension for users to evaluate apps, and accessibility refers to APP compatibility and offline ability [4].

### **2.2 APP Multi-dimensional Experience**

In general, the dimensions of user experience on apps can be divided into functional experience, information content experience, aesthetic experience, service experience, technical performance experience, information security experience, and marketing strategy experience.

#### ***(1) Functional Experience***

Functional experience refers to the user's psychological feeling about the function of APP module in the process of use. The main dimensions or indicators include the usefulness of the function, ease of operation, easy to learn, and so on. For example, in the context of educational mobile apps, AHP is conducted, and the results show that usability and usefulness are important dimensions for users to evaluate APP functions. In the context of mobile learning apps, Delphi method and questionnaire survey method are adopted to analyze and conclude that usefulness, interactivity and entertainment are important dimensions for users to evaluate APP functions [5]. In the context of social

mobile apps for the elderly, the AHP is adopted to analyze and conclude that ease of learning, use efficiency, social expansion, interactivity and knowledge display are important dimensions to evaluate APP functions [6].

### ***(2) Information Content Experience***

Information content experience refers to the user's experience of the APP information content. The main evaluation dimensions or indicators include information quality, information quantity, information timeliness, information visibility, information credibility, content comprehensiveness, content reliability, etc. For example, in the context of mobile APP, Delphi method and analytic hierarchy process are adopted, and information content is considered as an important dimension to measure the success of mobile APP, including indicators such as content completeness and user manual [7]. In the context of mobile learning APP, Delphi method and questionnaire survey method are adopted to analyze that information quality, timeliness and comprehensiveness are important dimensions of users' APP information content experience[5]. In the context of mobile recruitment APP, questionnaire survey method is adopted to analyze the comprehensiveness and reliability of APP content as an important dimension for users to evaluate the information content of mobile recruitment APP [8]. In the context of mobile apps of foreign database publishers, by analyzing the content of user reviews, the research results show that the rationality of content modules, the correctness of content and the depth of content are important dimensions for users to evaluate APP information content [3].

### ***(3) Aesthetic Experience***

Aesthetic experience refers to user's aesthetic and comfortable experience of the APP interface. The main evaluation dimensions or indicators include the aesthetics of interface design, interface color coordination, interface layout rationality, and interface refinement. For example, in the context of mobile APP, by using Delphi method and analytic hierarchy process, it is believed that interface design is an important dimension to measure the success of mobile APP [7]. In the context of educational mobile apps, the AHP is adopted, and the research results show that interface design is an important dimension for users to evaluate apps, which includes indicators such as moderate abstraction of images, uniform and beautiful style, appropriate size of text and graphics, and appropriate color [9]. In the context of mobile learning apps, Delphi method and questionnaire survey method are adopted to analyze and believe that aesthetics is an important dimension for users to evaluate apps. Indicators of aesthetics include interface color coordination, clarity, simplicity and aesthetics [9]. In the context of mobile education APP, literature analysis and expert interview methods are adopted, and it is believed that the interface design, media presentation, navigation design and visual design of APP are important dimensions for users to evaluate APP [10].

### ***(4) Service Experience***

Service experience refers to user's experience of the APP related services. The main evaluation dimensions or indicators include personalized customization services,

system maintenance services, free/paid services, etc. For example, in the context of mobile learning apps, Delphi method and questionnaire survey method are adopted to analyze that personalized service is an important dimension for users to evaluate apps, in which personalized service refers to personalized customized service with extra fees and different services launched according to users' personal needs [5]. In the context of mobile recruitment APP, questionnaire survey method is adopted to analyze that system maintenance service is an important dimension for users to evaluate the mobile recruitment APP [8]. In the context of mobile education apps, literature analysis and expert interview methods are used, and it is believed that free/paid services, offline/online services and big data evaluation services provided by apps are important dimensions for users to evaluate apps [10]. In the context of the mobile venue APP, expert interviews and questionnaire surveys are used, and it is believed that personalized content push service is an important dimension for users to evaluate apps [11].

### ***(5) Technical Performance Experience***

Technical performance experience refers to user's experience of the technical performance of the APP. The main evaluation dimensions or indicators include APP running stability, response speed, smooth navigation, fault tolerance, etc. For example, in the context of book apps, the analytic hierarchy process is adopted to analyze the running stability, response speed and update frequency of apps as important dimensions for users to evaluate apps [12]. In the context of mobile reading apps, the content analysis method is adopted and smooth navigation is considered as an important dimension for users to evaluate the technical performance of apps [13]. In the context of educational mobile apps, the analytic hierarchy process is adopted, and the running speed is considered as an important dimension for users to evaluate the technical performance of apps [9]. In the context of mobile recruitment APP, by using questionnaire survey method, and the results show that the navigability and coherence of modules are important indicators to evaluate the technical performance of APP [8]. In the context of mobile education APP, literature analysis and expert interview methods are adopted to analyze that stable operation and scalability are important indicators to evaluate the technical performance of APP [10].

### ***(6) Information Security Experience***

Information security experience refers to user's experience of the APP operator's protection of user data, property, privacy and other information [14]. In different APP context, some research has developed or adopted corresponding indicators to evaluate users' information security experience of apps. The main evaluation dimensions or indicators include privacy information security, personal and property security, complaint mechanism, etc. For example, in the context of mobile APP, by adopting logical induction method, APP security is considered as an important dimension of user experience. In the context of mobile APP, Delphi method and analytic hierarchy process are adopted to consider security as an important dimension to measure the success of mobile APP, among which communication confidentiality and user privacy information protection are important indicators of security [5, 7]. In the context of social mobile

APP for the elderly, the analytic hierarchy process is adopted to analyze that privacy information protection and personal and property safety are important dimensions of users' APP experience [6].

### ***(7) Marketing Strategy Experience***

Marketing strategy experience refers to user's experience of the marketing strategy adopted by the APP platform operator. The main evaluation dimensions or indicators include reward mechanism, preferential activities, gamified marketing, etc. For example, in the context of book APP, the analytic hierarchy process is adopted and marketing strategy is considered as an important aspect of user evaluation of APP, including reward mechanism, preferential activities, charging model and other dimensions [12]. In the context of mobile e-commerce apps, the questionnaire survey method is adopted to analyze that personalized intelligent recommendation is an important dimension for users to evaluate apps and will have an impact on users' e-commerce APP usage [15]. In the context of mobile apps, the questionnaire survey method is adopted to analyze and conclude that gamification marketing of apps will affect users' continuous use of apps and is an important dimension for users to evaluate apps [1]. In the context of mobile e-commerce apps, by adopting logical analysis method, it is believed that APP marketing strategy is an important dimension for users to evaluate apps and will affect user stickiness [16].

## **2.3 APP User's Overall Psychological Judgment**

It refers to user's overall psychological satisfaction or feeling after multidimensional experience of the APP. The main evaluation dimensions or indicators include satisfaction, pleasure, and so on. User satisfaction is a common dimension of evaluating information system, which indicates one kind of psychological satisfaction after IS experience. Pleasure is the overall feeling of comfort after user experience. For example, in the context of mobile learning apps, Delphi method and questionnaire survey method are adopted to analyze and conclude that pleasure is an important dimension for users to evaluate apps [5]. In the context of social mobile apps for the elderly, the analytic hierarchy process is adopted to analyze that satisfaction and pleasure are important dimensions to evaluate apps in general [6]. In the context of mobile venue APP, expert interview and questionnaire survey are adopted in the research, and it is believed that user recognition is an important dimension of APP evaluation [11].

## **2.4 Continuous APP Use**

Whether users continue to use apps depends on their overall psychological judgment after multidimensional experience, which is an important dimension of APP evaluation. Similar evaluation indicators include: continuous use, user engagement, user loyalty, and activity. For example, in the context of mobile learning apps, Delphi method and questionnaire survey method are adopted to analyze and believe that user viscosity is an important dimension of APP evaluation. User viscosity refers to the "loyalty" of

users and emphasizes the durability of users' use of apps [5]. In the context of mobile venue apps, expert interviews and questionnaire surveys are adopted, and the research finds that the use activity is an important dimension to evaluate apps [11].

### 3 Summary and Future Research Prospect

Users' continuous use is the key to the success of an APP. In general, APP evaluation based on user perspective has attained great attention from the academic community. The relevant evaluation dimensions can be divided into four stages based on time logic: APP acquisition, multidimensional APP use experience, users' overall psychological judgment of apps, and users' continuous APP use. The logical relationship between the evaluation dimensions of the four stages is as follows: APP acquisition is the prerequisite and basic condition for the multidimensional APP use experience, and the multidimensional APP experience will jointly affect the user's overall psychological judgment of the APP, and then determine the user's continuous APP use. The APP evaluation dimensions based on the user perspective and the logical relationships among each evaluation dimension is shown in Figure 1.

In general, the existing research on the evaluation of mobile apps has carried out multi-angle and multi-dimensional analysis on different types of APP context, indicating that the application of mobile APP is a systematic project, which needs to carry out APP development, implementation, operation and upgrade based on user perspective, paying attention to user needs and multi-dimensional user experience to promote users to continue to use the APP, to achieve the successful application of the APP, and to obtain sustainable competitive advantage.

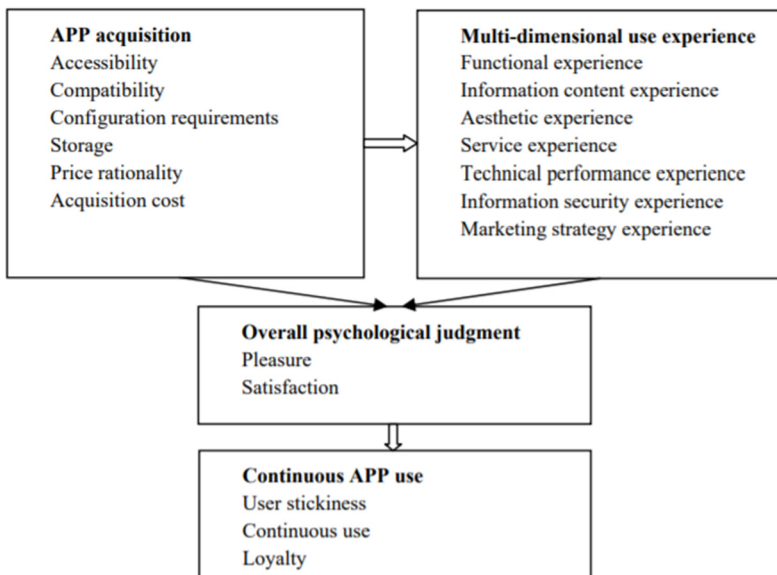


Fig. 1. APP evaluation system based on user perspective

In addition, existing studies mostly focus on the evaluation and analysis of apps such as education, social networking and sports, while the evaluation index system analysis of mobile e-commerce apps is still not systematic and comprehensive enough. However, in the era of digital economy, mobile e-commerce apps are booming, and people generally use APP to do shopping. Logistics services, customer service and commodity quality supporting the operation of mobile e-commerce apps will also determine whether mobile e-commerce apps can be successfully applied. As mentioned above, in terms of APP service dimension, existing research focuses on maintenance services based on the system itself and personalized services based on information content, while there is still insufficient empirical analysis on customer service, logistics service, physical commodity quality and other indicators supporting e-commerce apps. Future studies may identify indicators such as supporting services and commodity quality for mobile e-commerce apps, and carry out a more systematic construction of mobile e-commerce APP evaluation indicators to provide a systematic evaluation dimension and measurements for promoting the high-quality development of mobile e-commerce.

### Acknowledgment

This work is supported by Guangdong Province Philosophy and Social Science Planning Project titled “Mobile E-Commerce APP Users’ Expectation Confirmation Composition Model and the Mechanism of its Influencing Continuous Use”(Grant No. GD23XGL014).

### References

1. Mou, Y. P., Cao, Y. J., Zhang, H.: The Impact of the gamification design of platform enterprises on users’ continuous usage behavior. *Chinese Journal of Management*, (9): 1-10 (2023). In Chinese.
2. Bhattacharjee, A.: Understanding information systems continuance: an expectation-confirmation model. *MIS Quarterly*, 25(3): 351-370 (2001).
3. Zhang, S. M., Yan, X. Y., Xie, L.: Analysis of foreign database publishers’ mobile Apps and user comments. *Library Journal*, 31(6): 56-61 (2012). In Chinese.
4. Guo, Y., Li, X. T., Du, X. Y., Liu, S.: Research on application effects of mobile App under the new media environment. *Library and Information Service*, 62(9): 73-80 (2018). In Chinese.
5. Zhang, Y., Zhu, Q., Li, M.: Construction of the evaluation index system of mobile learning App from the perspective of user experience based on D-S evidence theory. *Journal of Intelligence*, 38(2): 187-194 (2019). In Chinese.
6. Lv, C. M., Wang, S., Tang, Y. H., Huang, Y. J.: Research on usability evaluation index of social App for the elderly based on analytic hierarchy process. *Journal of Machine Design*, 36(2): 174-177 (2019). In Chinese.
7. Huang, W., Li, Z. K., Huang, J. Q.: Research on evaluation index system of App. *Library and Information*, (3): 110-117 (2016). In Chinese.

8. Barreto, D. S., Alturas, B.: Quality-in-use App evaluation: case of a recruitment App for Portuguese SMEs. *Journal of Information Systems Engineering & Management*, 3(1): 1-9 (2018).
9. Wang, L. Z., Fu, L. P., Lu, X. Q., Chen, C.: The construction of evaluation index system of educational Apps from the multidimensional perspective. *Theory and Practice of Education*, 39(1): 31-35 (2019). In Chinese.
10. Gong, C. H., Zeng, X. Q.: Research on the quality evaluation index system for the educational App based on the PACTS model. *Modern Education Technology*, 28(1): 45-51 (2018). In Chinese.
11. Du, H., Yang, X. H.: Research on evaluation index system of mobile learning tools---venue App evaluation as an example. *Distance Education in China*, (8): 63-69 (2018). In Chinese.
12. Huang, P. Y., Yuan, Q. J.: Research on the evaluation index system of book Apps from user's perspective. *Library*, (12): 66-72 (2019). In Chinese.
13. Zheng, F. Q., Zhao, Y. X., Zhu, Q. H.: Comparative studies on the human-computer interaction and digital reading platform: from the perspective of user experience. *Library Journal*, 34(7): 50-58 (2015). In Chinese.
14. Liu, Y., Zhou, Y., Nong, Y. Q.: Users' personal information security risk and governance on network information service platforms: content analysis based on 117 app privacy policy texts. *Library and Information Service*, 66(5):33-43 (2022). In Chinese.
15. Fan, W. F., Wang, Q.: Research on the influence of personalized intelligent recommendation on consumers' online impulse buying intention. *Management Review*, 34(12): 146-194 (2022). In Chinese.
16. Song, C. M.: Research on mobile e-commerce shopping platform scene marketing innovation strategy. *Economic Research Guide*, (6): 58-60 (2022). In Chinese.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

