Continuous Usage Intention of Artificial Intelligence (AI)-Enabled Mobile Banking: A Preliminary Study

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ABSTRACT

As a ground-breaking application of financial technology, mobile banking can provide practical value to users and banks. Artificial intelligence (AI) has been widely studied in research related to mobile banking; however, the way in which the use of AI influences users' continuance intention with respect to mobile banking has not been established from the perspective of an expectation confirmation model (ECM). To address this research gap, this paper develops a research model by integrating an ECM and two AI characteristic constructs, namely, perceived intelligence and perceived anthropomorphism, to explore users' continuance intention. The model can provide theoretical advancements for AI-enabled mobile banking research.

Keywords: *Mobile banking, Continuance intention, Artificial intelligence, Expectation confirmation model.*

1. INTRODUCTION

As a new technology platform emerging from financial technology, mobile banking employs artificial intelligence, which is a key innovative technology, to transform traditional offline banking services into mobile banking services via the internet [1]. The emergence of mobile banking has important implications for both users and banks. Mobile banking can provide users with more convenient services and reduce the impact caused by physical obstacles.

Artificial intelligence (AI) has gradually become a research focus in the field of mobile banking and played a crucial role in the development of the field [1][2] [3][4]. Artificial intelligence refers to the use of computer operations by machines to simulate human intellectual activities and to provide services or complete a series of tasks to help users or businesses in different contexts [1]. The combination of front-end interaction and back-end computing operations used in artificial intelligence can promote the transformation of traditional mobile banking to intelligent mobile banking, thereby fundamentally meeting users' needs for personalized and intelligent services and enhancing user experience. Research shows that users' willingness to use AI-based applications and systems may be influenced to a large extent by the nature of the AI [4]. Users' continuance intention is an important factor in the successful development of mobile banking [5]. Most scholars have used the technology acceptance model (TAM), the information system success model (IS) and the technology integration acceptance model (UTAUT) to study the factors influencing users' continued adoption intention with respect to mobile banking [4].

However, unlike these models, the expectation confirmation model (ECM) focuses on continued user experience and satisfaction. The ECM has gradually been applied to study the behaviour of users in mobile banking, ranging from the context of initial acceptance to that of continued use of the service [5]. Because most mobile banking currently uses AI to improve its functions, it is crucial to determine whether artificial intelligence has an impact on the experience of mobile banking users. If AI has such an impact, the two most significant features of the process of using AI - perceived intelligence (PI) and perceived anthropomorphism (PA), which users can perceive during this process - affect users' continuance intention in accordance with the ECM. Therefore, this paper attempts to establish a hypothetical model based on ECM, including these two characteristics of AI (anthropomorphism and intelligence) as antecedent variables and confirmation, perceived usefulness and satisfaction as mediating variables. In this model, the

dependent variable is users' continuance intention with respect to mobile banking.

2. LITERATURE REVIEW

2.1. The ECM in Mobile Banking

Mobile banking refers to the use of mobile terminals to complete various banking operations in the financial industry online, and this approach can provide updated, broader and more efficient services in real time [6]. In the context of mobile banking, it is five times more expensive to acquire first-time users than to retain existing users [5]. Therefore, users' willingness to continue to use mobile banking should be taken seriously. To understand the continuance intention of mobile banking users, many scholars have employed the TAM model and the UTAUT model to study continuous usage behaviour in the context of information systems [4][5]. However, compared with many technology adoption models, the ECM is more suitable for explaining factors that affect users' continued willingness to use the technology in question [7]. Based on the ECM model, users form the initial expectations before using mobile banking. The willingness of users to continue to use mobile banking depends on whether the users' initial experience meet expectation, the perceived usefulness and satisfaction of the mobile banking [5].

The ECM originated from Oliver's (1980) expectation-confirmation theory (ECT), which has been widely used in the field of marketing to study consumer satisfaction and repeat purchase behaviour [7]. The individual's decision to continue using an information system in the ECM is affected by initial user expectations. That is, the user's feelings after using the product or system for the first time has an impact on the user's continued use [7]. Four variables are used in the ECM: confirmation (CONF), perceived usefulness (PU), satisfaction (SAT) and IS continuance intention (CI). In the field of mobile banking, to study the factors that affect users' continued willingness to use mobile banking in depth, scholars have combined ECM with other theories by adding new variables, such as perceived security, trust, and self-efficacy, which can expand the model and enhance its ability to explain user behaviour [5].

2.2. The Effect of AI on Mobile Banking

Recently, the incorporation of AI technology into mobile banking has accelerated the process of internet-based mobile banking [1][2][3][4]. AI can combine intelligent performance and human-like behaviour to help users solve problems and improve user experience [1]. Mobile banking AI can interact with users via verbal or textual communication and even provide more sophisticated services such as personalized investment advice and fraud detection [3].

Research has shown that the success of mobile banking depends to some degree on how comfortable users feel with AI in the context of mobile banking [3]. The difference between AI and other systems lies in its ability to understand and perceive of humans and the intelligent personalized services it can provide, namely, the two key characteristics of intelligence and anthropomorphism [1]. The intelligence of AI is reflected in its speed and flexibility with respect to achieving goals and solving problems, its self-learning ability and its awareness of the environment, which can effectively solve difficult and complex problems for humans [6]. Perceived intelligence depends on the ability of the AI system, which refers to the user's perception of the machine's intelligence in terms of factors such as skills, knowledge transfer, and responsiveness [8]. In mobile banking, based on its performance and intelligent architecture, AI can use algorithms contained within the system to infer the user's intentions, propose solutions, and provide personalized services in accordance with the user's answers and knowledge input by the machine itself [6]. Anthropomorphism refers to the sociability involved in human-computer interactions, which enables the AI to simulate human characteristics such as human emotions, human behaviours, and human language [8]. Perceived anthropomorphism can be defined in terms of the degree to which a user perceives a machine to be human-like [6]. Mobile banking AI employs avatars that simulate human faces to allow the AI to look more like a human being, uses fluent spoken language and different intonations to communicate with users to allow the AI to seem respectful, friendly and careful, and even adopts various expressions to show happiness after helping users complete tasks and providing enthusiastic service [1]. These human-like features cause users to feel as if they are interacting with real people, which increases users' perception of anthropomorphism and enhances the emotional resonance between AI and users, thereby promoting trust [6].

Therefore, to determine whether the use of AI in mobile banking can meet the needs of users and help banks improve users' willingness to continue using mobile banking. This paper attempts to investigate the ways in which two features (i.e. intelligence and anthropomorphism) affect the variables used in the ECM and ultimately impact the continuance intention of users with respect to mobile banking.

3. THE RESEARCH MODEL

AI is widely applied in mobile banking and the ECM can be used to explain users' continuance intention. To identify how the impact of AI on mobile banking, we integrate the AI feature into ECM by developing a research model, as shown in Figure 1. Specifically, this paper explores and investigates intelligence and anthropomorphism as antecedent variables in the ECM.

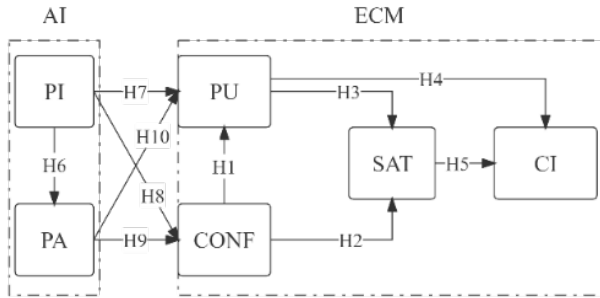The following discusses the development of the model and hypotheses.

Figure 1. Research model.

3.1. The ECM and Mobile Banking Continuance Intention

Confirmation is determined by the strength of the gap between actual performance and expectations with respect to each instance of adoption, thus reflecting the user's perception of consistency between the two [7]. If the perceived service experience meets or exceeds the expected value, users will produce positive consistency perception, i.e., confirmation. When users experience a sense of consistency, they tend to believe that mobile banking can meet their needs, thus improving their satisfaction with mobile banking. Moreover, some users may not understand mobile banking and its value, their initial expectations and perceived usefulness may be low. After initial usage of users, they may increase their perceived usefulness.

Perceived usefulness reflects the user's perception of benefits after using an information system [7]. Perceived usefulness has a positive impact on user satisfaction. That is, the more that users believe that mobile banking provides useful value, the higher their satisfaction with mobile banking.

Satisfaction refers to an emotion experienced by users when an information system meets their needs and expectations [7]. When users utilize mobile banking to meet their needs, the satisfaction provided by their expectations enhances their intention to continue to use mobile banking. With respect to the relationships among the variables used in the ECM, we can hypothesize the following:

H1: Confirmation has a positive effect on perceived usefulness.

H2: Confirmation has a positive effect on satisfaction.

H3: Perceived usefulness has a positive effect on satisfaction.

H4: Perceived usefulness increases users' continuance intention with respect to mobile banking.

H5: Satisfaction increases users' continuance intention with respect to mobile banking.

3.2. Perceived Intelligence, Perceived Anthropomorphism and the ECM

The success of the implementation of anthropomorphism lies in the user's perception of human-like characteristics in nonhuman actors, and the degree of perception describes the perceived anthropomorphism [6]. Intelligence is another major attribute of AI. Users can employ AI to improve the efficiency of online transactions, solve operational problems, and provide personalized financial advice. The intelligence and anthropomorphism of AI in the context of mobile banking are complementary. Users tend to combine intelligent technology and anthropomorphic technology. In other words, when users engage in mobile banking, the intelligent features displayed by AI may be regarded by users as a manifestation of friendliness and respect, which highlights the users' perceptions of the humanization of AI [2]. That is, when AI uses natural, simple and clear language to exhibit intelligent performance, people tend to think that the AI can communicate and help them like a real person [2]. Therefore, we hypothesize:

H6: Perceived intelligence can promote perceived anthropomorphism.

Artificial intelligence relies on the ability of the system to combine digital processing algorithms with speech and text recognition functions to communicate with users in an easy-to-understand way to obtain data, intelligently and quickly understand users' needs and help users complete tasks efficiently [8]. Perceived intelligence refers to the degree to which users perceive the technology and its capabilities to be intelligent in the context of their interactions with AI [6]. That is, when users perceive the intelligence of AI in mobile banking, they tend to believe that the AI involved in mobile banking can deal with problems quickly and effectively, thus facilitating the provision of various financial services. AI technology in mobile banking is embodied in replacing of manual customer service. With the development of AI, when a user wants to purchase wealth management products in mobile banking, AI can provide a personalized recommended purchase plan based on risk-taking level and income of users. When users perceive the intelligence of AI to achieve their expectations regarding mobile banking, the user's confirmation after the first use of mobile banking is improved. In addition, the intelligence of AI can help users use the services provided by banks easily, which can cause users to believe that mobile banking is useful and increase users' perceived usefulness with respect to mobile banking. Thus, we hypothesize:

H7: Perceived intelligence can improve user confirmation.

H8: Perceived intelligence can improve perceived usefulness.

AI can reflect emotions in user interactions, such that users generate perceptions of anthropomorphism [8]. Anthropomorphic features can instil positive emotions in users, change users' attitudes and cognitions regarding products, and enhance user experiences. Specifically, AI can understand the user's needs, perceive the user's emotions by way of information provided by the user, and provide care via text or images. Thus, the user can experience warmth and trust when using AI and become willing to engage in deeper interactions with AI [1]. Due to the influence of artificial intelligence, people believe that the anthropomorphic elements perceived in mobile banking can enable them to obtain friendly service, just as they could from real people in a face-to-face environment. Accordingly, their actual use of mobile banking increases, and they tend to confirm that mobile banking meets their expectations. Moreover, mobile banking AI can communicate using simple and easy-to-understand language similar to human dialogue to prompt and help users in completing difficult operations. Additionally, such AI can respond quickly to problems during this process and accept users' transaction requests [1]. Therefore, we hypothesize:

H9: Perceived anthropomorphism can improve confirmation.

H10: Perceived anthropomorphism can improve perceived usefulness.

4. CONCLUSION: WHAT IS NEXT?

Today, AI technology has penetrated mobile banking [1]. How the AI features of intelligence and anthropomorphism affect users' intentions and behaviors concerning mobile banking remains unknown. In this regard, we attempt to develop a research model by integrating AI features and ECM model to explore user continuous usage of AI-enable mobile banking. In the next stage of research, an empirical investigation will be conducted. It is hoped that through the discussions at this prestigious conference, valuable comments and suggestions can be gathering for aiding in the development of the model.

ACKNOWLEDGMENTS

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