

# Mobile Banking: Overview of Most Common Theoretical Foundations of Technology Adoption

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**Abstract:** In a connected economy, financial services must be dynamic, customer-centric, available and compatible with consumers' lifestyles. As an innovative technology, Mobile Banking (M-banking) represents a good example of new technology allowing customers to produce financial transactions via mobile devices. The paper aims at determining different theoretical foundations adopted by several researchers who try to explain the perceptions and behaviours of customers with regard to mobile banking as well as the factors that could predict the use of mobile banking services by banking customers. This study provides an overview by analyzing the current state of art in knowledge of mobile banking and its theoretical foundations. The results suggest the predominance of technology adoption models such as TAM, UTAUT and UTAUT2.

## 1 INTRODUCTION

The advent of technology has transformed the banking sector. Today, banks are investing heavily in mobility, which has become an essential strategic axis for the development of the sector. It's a change in the way that banking services are used, in the bank / customer relationship, and simply in the way of money management. This phenomenon is so important that IT professionals have described it as one of the most important developments in the field of business and mobile commerce (Oliveira and al, 2014).

Some authors show that M-banking strengthens relationships and emphasizes its benefits for customer relationship management. Thus, banks seems not only willing to integrate the channels of mobile banking services into their logistics structure to provide better service to their customers, but also to improve the effectiveness and efficiency of these channels (Sharma and Sharma, 2019).

It has been noticed that user attitudes towards accepting a new information system has an impact on its success (Al-Somali and al, 2009). The problem is that financial institutions still do not have an exact and precise idea of the behaviors of consumers to accept, use and be loyal through the use of mobile banking services (Shareef and al,

2018). Banks do not have enough information on why customers use mobile banking services and why they will continue to use them in the long term (Albashrawi and Motiwalla, 2020). This clearly explains that mobile banking remains a relevant and interesting research topic around the world, especially in terms of the adoption of this innovative channel and its feasibility to gain customer satisfaction and loyalty.

The following section includes a presentation of mobile banking benefits for both costumers and banking institutions. Then a literature review is presented in the next section before addressing the theoretical foundations of technology acceptance and a comparative analysis of main theoretical models of technology adoption. Then a discussion section is presented before formulating some conclusions.

## 2 MOBILE BANKING BENEFITS

M-banking is a new technology that is increasingly present in banking establishments given to its many advantages in terms of reducing operating costs and improving customer relationship management. This service also presents many benefits to banking customers in terms of access and mobility. Mobile

banking has become the self-service delivery channel that enables banks to deliver information and offer services to their customers with more convenience (Lin, 2013).

From the beginning, Mobile banking services allowed customers to perform account balance inquiries, surveys of transaction history, fund transfers and bill payments via mobile devices. Indeed, when it was launched, mobile banking only provided general banking transactions. In the present times, mobile banking application offer more complex services such as credit request or financial investments.

(Lin, 2013) explains that mobile banking is a set of mobile commerce applications that allow customers to perform both conventional transactions (e.g fund transfers), but also more advanced operations (e.g trading and portfolio management).

(Oliveira and al, 2014) confirms that M-banking includes three components which are mobile accounting (e.g check book requests, blocking lost cards, transferring money or insurance policies subscription ), mobile brokerage (sale and purchase of financial instruments), and mobile financial information services (e.g balance requests, statement requests, exchange rate information).

Mobile banking services thus meet customers needs and also business needs. Indeed, it is clearly demonstrated that, as a self-service technology, it is an important factor in reducing staff costs. By replacing physical retail banking with intensive labor to automated processes, banks improve their productivity, efficiency and profitability (Asad and al, 2016).

### 3 LITERATURE REVIEW

Mobile banking has seen exponential use around the world and, as a result, spectacular growth in the literature. Examining and explaining the adoption of mobile banking services is at the center of research of several academics and practitioners around the world.

Much research has been used and sometimes even combined several theoretical models of technology acceptance. This is the case of the study carried out in 2020 by (Le and al ,2020) among 370 customers that have never used or are currently using mobile banking in Vietnam. This work, based on the theoretical model of UTAUT in its first and second version and TAM, has shown that some factors have been assessed to be more important than others in affecting intention to use mobile

banking services. First, the authors cite social influence which means that an individual, who perceives and uses mobile banking services, is strongly influenced by people and environment around him. Secondly, they address the compatibility that corresponds to the user's external environment that will help him overcome the obstacles associated to the use of new information technology. Then come other factors such as performance expectancy, perceived ease of use, perceived trust, perceived cost, and behavioral intention. When these factors come together, this leads to a high level of use of mobile banking services through regular use.

(Alalwan and al, 2017) developed a conceptual model adapted from the UTAUT2 model, but this time not by combining it with another model but by integrating an external variable which is trust. The objective of this Jordanian study carried out on a sample of 343 users was to study the most important factors that predict the actual adoption of M-Banking services. Several explanatory variables have been mentioned in this work such as performance expectancy, hedonic motivation and trust.

In the work of (Masrek and al, 2014), the authors has also studied the relationship between technological trust and satisfaction in mobile banking. Masrek and al used a quantitative research methodology via a survey involving 312 M-banking consumers in Malaysia. The results of the study confirmed the importance of technological trust in predicting satisfaction in mobile banking services.

(Albashrawi and Motiwalla, 2020) explained in the United states during 2020 the acceptance of mobile banking using the UTAUT model by integrating another model which is the information Systems Success of Delone and Mclean (ISSM). The approach adopted by the authors combined subjective measures that capture perceptions of system use (e.g by asking users) with objective metrics that capture actual system usage (by analyzing users' bank files in terms of frequency and duration of use), in order to avoid the potential biases generated by overestimating or underestimating of system user. The results of the study highlighted, among other things, that bank practitioners should focus on improving the quality of M-banking service without forgetting social influence, because both of these factors have proven to be essential for consumers of mobile banking in USA.

The study by (Lin, 2013) was carried out among 300 Taiwanese bank customers to assess the importance of the quality of mobile banking factors between two groups of customers, a first group with

little experience in mobile banking and a second group with high experience in mobile banking. According to the author, the quality of mobile service is increasingly recognized as a critical factor for a successful implementation of mobile banking. The results of the study confirm that customers with low and high experience generally consider the quality of mobile service in terms of speed, reliability, convenience and personalization as essential elements for a high quality of M-banking which can increase customers' trust in their bank.

(Oliveira and al, 2014) combined three models of information systems, namely Unified Theory of Acceptance and Use of Technology (UTAUT), Task Technology Fit (TTF), and Initial Trust Model (ITM), to better understand the adoption of mobile banking services in Portugal among 194 customers. The study found that the most important concepts behind the adoption of M-banking are behavioral intention of customers to adopt a new technology, facilitating conditions, performance expectancy and trust. According to Oliveira and al, customers are more willing to trust in a new service such as mobile banking if company's reputation is good and also if a risk insurance service is implemented.

The conceptual model developed by (Baabdullah and al) in 2018 used the information Systems Success of Delone and Mclean (ISSM) by combining it with the UTAUT2 model in order to verify the way the use of M-banking could contribute to satisfaction and loyalty of customers in Saudi Arabia.

The results of this study conclude that customers who see M-banking as a reliable communication channel for access to bank services, develop a feeling of loyalty and satisfaction towards their banking institutions.

The effects of mobile banking adoption on customer relationship management, satisfaction and customer interaction are also analyzed in the study conducted by (Hamidi and Safareeyeh, 2018) in Iran. The authors conclude that using mobile banking technology allows more interaction and communication with customers and that is clearly on the advantage of customer relationship management.

#### 4 THEORETICAL FOUNDATIONS OF TECHNOLOGY ADOPTION

The literature on the adoption of Information Technology (IT) provides several theoretical

models. A considerable number of researchers have formulated different models relevant to the field of IT in order to further explain the acceptance of technology from a user perspective. However, three theoretical models stand out and come up most often in research on the adoption of M-banking technology. The Technology Acceptance Model (TAM) established by (Davis and al, 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) established by (Venkatesh and al, 2003) and the second version of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) developed by (Venkatesh and al, 2012) after.

These theoretical models of the adoption of systems informations have been validated by a variety of research fields including mobile banking over the past decade (Albashrawi and Motiwalla, 2020). The following table presents a comparative analysis of the different variables that constitute them.

Table 1: Comparative table of main theoretical models of technology adoption

	TAM	UTAUT	UTAUT 2
External Variables	X		
Perceived Usefulness	X		
Perceived Ease of Use	X		
Attitude Towards Using	X		
Behavioral Intention	X	X	X
Performance Expectancy		X	X
Effort Expectancy		X	X
Social Influence		X	X
Facilitating Conditions		X	X
Gender		X	X
Age		X	X
Experience		X	X
Voluntariness of Use		X	
Hedonic Motivation			X
Price Value			X
Habit			X

## 4.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is the most widely used technology adoption model cited by many researchers, with over 117,000 citations on Google Scholar<sup>1</sup> in 2020 of which nearly 20,000 are Scopus indexed.

TAM was introduced first for information systems by Davis and al in 1986 and then developed in 1989. Following a longitudinal study with 107 users in order to identify the appropriate functionalities and interfaces of systems information to end users. The authors present three essential theoretical constructs which are perceived usefulness, ease of use, and behavioral intention.

Perceived usefulness and perceived ease of use are two beliefs that create behavioral intention. While behavioral intention is favorable to the use of the technology and therefore affects the actual use. These are for Davis and al the main determinants of user attitudes towards the adoption of new technologies.

The TAM model has been the measure of several empirical studies. Many researchers have introduced additional variables to the TAM or they have combined it with other models to suggest new conceptual models (Le, 2020), (Hassan and Wood, 2020), (Watat and Madina, 2019), (Gumussoy and al, 2018), (Filali Halime, 2017) and (Mostafa, 2015).

According to (Boonsiritomachai and Pitchayadejanant, 2017), the popularity of TAM model is probably due to two aspects. First of all, TAM was created to analyse the adoption of technology in different cultural and technological contexts with different levels of user expertise. Secondly, TAM has been the subject of numerous empirical studies in different fields of research, which in conclusion support its overall explanatory power. Indeed, its strong presence in the literature has made it a measurement scale with high validity for over thirty years.

However, some researchers have criticized the TAM model and recommended that it be extended to include other variables in order to strengthen it.

## 4.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

The second theoretical model cited in many recent studies is the Unified Theory of Acceptance and Use of Technology (UTAUT) (Albashrawi and Motiwalla, 2020), (Giovanis and al, 2019) (Nugraha and al, 2018), and (Barati and Mohammadi, 2009). This model is also widely used by several researchers, with nearly 24,000 citations on Google Scholar<sup>2</sup>, of which more than 2300 are Scopus indexed.

This model has been proposed as an extension of the popular TAM which aims to explain the intention of users to adopt an information system. It is considered as an influential theory in the context of the adoption of new technologies.

Venkatesh and his co-authors proposed in 2003 this model through a study of 215 users. They claim that four elements are the antecedents of behavioral intention, namely performance expectancy, effort expectancy, social influence and facilitating conditions.

Performance expectancy is the extent to which people believe that using mobile banking services will help them to achieve performance gains. According to Venkatesh and al, this is the degree to which the use of a technology will provide benefits to consumers.

Effort expectancy is linked to the ease of access to the M-banking service and the effort that will be made in this regard.

Social influence is presented by Venkatesh and al as the extent to which consumers perceive other important people such family and friends believe that they should use a particular technology.

Facilitating conditions represent the degree to which people find it easy to connect and use mobile banking services (e.g setting up an assistance service).

According to the authors, performance expectancy, effort expectancy and social influence affect behavioral intention. While behavioral intention combined with the facilitating conditions, determines the use of technology. Age, gender, experience and voluntariness of use are presented by the authors as moderating variables into this model.

<sup>1</sup> [https://scholar.google.com/scholar?hl=fr&as\\_sdt=0%2C5&q=technology+acceptance+model+tam&oq=TAM](https://scholar.google.com/scholar?hl=fr&as_sdt=0%2C5&q=technology+acceptance+model+tam&oq=TAM), Accessed on 23/08/2020

<sup>2</sup> [https://scholar.google.com/scholar?hl=fr&as\\_sdt=0%2C5&q=unified+theory+of+acceptance+and+use+of+technology+UTAUT&btnG=](https://scholar.google.com/scholar?hl=fr&as_sdt=0%2C5&q=unified+theory+of+acceptance+and+use+of+technology+UTAUT&btnG=), Accessed on 23/08/2020.

### 4.3 Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2)

Venkatesh and al presented a second version of the UTAUT model which is the UTAUT2 to study technology adoption especially in the context of Mobile Banking through a survey of 1512 mobile internet consumers (Venkatesh et al., 2012) .

The authors have introduced to UTAUT three constructs which are hedonic motivation which is the pleasure felt from using technology, the value of prize because consumers must pay the costs associated with purchasing devices and subscribing to the service, and habit, which is the extent to which consumers tend to automatically adopt certain behaviors.

The aim of the authors was to make the model more suited to the context of the use of technologies by the general public. This is successful given that UTAUT 2 has been the subject of several studies around the world (Merhi and al, 2019), (Baabdullah , 2018), (Alalwan, 2017), and (Boonsiritomachai and Pitchayadejanant, 2017).

## 5 DISCUSSION

The existing literature is full of studies that have discussed the adoption of mobile banking among users, on the basis of the aforementioned theoretical models. Indeed, many theoretical foundations have supported the conceptualization of several research models dealing with M-banking.

This literature review allowed us to identify most present theoretical foundations in previous work, namely TAM, UTAUT and UTAUT 2 models then to establish a comparative analysis of different variables that constitute them with the aim of highlighting the various points of convergence and divergence between these models.

For this purpose, behavioral intention is the common variable of the three theoretical models. The authors of this literature review consider behavioral intention as a cornerstone of M-banking adoption.

Variables such as perceived usefulness and perceived ease of use were introduced by TAM. UTAUT and UTAUT 2 share several variables in common such as, Effort Expectancy, Social Influence, Facilitating Conditions and Performance Expectancy. While other variables are specific to each of the two models such as voluntariness of use for UTAUT or hedonic motivation, price value and habit for UTAUT2.

By eliminating the variable of voluntariness of use and integrating new variables, the authors attempt to adopt the second version of UTAUT to the business environment of mobile banking from consumers perspective.

This work also allowed us to observe that several researchers do not use a single model to study technological adoption, but attempt to combine two or more theoretical models in their works. In addition, many studies integrate new explanatory variables into these models, in order to explore better the adoption of M-banking technology by customers.

## 6 CONCLUSION

In the current digital age, mobile banking has a double benefit: it serve the interests of banks and those of its customers. M-banking plays an important role in helping banks to acquire new customers and developing the relationship with existing consumers. It allows to meet their constantly changing requirements, satisfy them with a distinct value and then create a competitive advantage.

It is also one of the most effective tools that have emerged to minimize costs and lighten the work load for banking staff to allow them to focus their efforts on other more complex and profit generating activities.

Moreover, financial institutions develop and promote this service because it offers the possibility of placing different products to several customer segments and thus allowing to maintain profitable relationships (Tam and Oliveira, 2019).

The main motivation behind the above-mentioned theoretical models of technology adoption has been to go beyond the barriers that hinder the adoption of M-banking in order to increase the number of clients using this technology.

The importance of adopting and implementing electronic banking services as a means of reducing operational and transactional costs and increase customer satisfaction and loyalty is validated, but they are some prerequisite for this like provide customers a support that is secure, complete, easy to use and delivered under favorable conditions.

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