

I have seen the future, and it rings – What we know about mobile banking research

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SUMMARY

In the history of banking services, mobile banking has been thought of as a key interactive channel between financial institutions and customers. The last decade there has been an increasing interest in studying mobile banking topic. Most literature in the field of mobile banking has only focused on an individual approach and lacked the macro approach and industry approach. Therefore, this research aims to show a comprehensive review of mobile banking research in past decade and analyses the significant results from previous research. This paper makes a contribution to a deeper understanding of mobile banking from a macro approach and industry approach.

Keywords: mobile banking; financial services; banking services; descriptive literature review, banking industry

Journal of Economic Literature (JEL) codes: G21

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INTRODUCTION

Technology development offers many industries a great opportunity to provide new digital services. In banking industry, adopting these remarkable achievements has become a central issue for financial services. Recently, providing services on the mobile platform has been a major area of interest within the field of financial and banking services. Furthermore, mobile banking is considered a business model and competitive strategy in each bank. This means that banks release mobile banking services as a response to intense competition in the banking industry when mobile banking is expected to become a major channel for bank transactions (Lee et al. 2015). Mobile banking (MB) brings both opportunities and challenges for banks, since the financial service market is expanding and involved with more participants and stakeholders. Newcomers often encounter higher competition and risks. Meanwhile, the legal environment greatly affects the responsibilities of members in the market. That context requires financial institutions in every country to have a broader view of mobile banking services that are not limited to the customers' aspect.

The concept of mobile banking has received considerable critical attention by many researchers. While the current studies mainly focus on mobile banking adoption, the research related to the macro approach, service quality, and the competitive landscape in mobile banking topic is quite scattered. There have

been studies on individual adoption and individual performance with mobile banking. While these studies in the mobile banking literature have only focused on customer or individual adoption (Ha et al. 2012; Shaikh & Karjaluo 2014; Tam & Oliveira 2017), no previous studies have investigated a literature review in other aspects such as a macro approach, industry approach or legislation topic (Onay & Öztaş 2018). This prospective study was designed to provide a comprehensive analysis of mobile banking studies beyond individual adoption. By interpreting and analysing the results obtained from previous studies, this study may provide new insights into the topic of mobile banking for researchers, managers, and stakeholders. Furthermore, the study helps future researchers shorten the time for literature review for future mobile banking topics.

The literature review was conducted through several steps, followed by the selection of studies between 2011 and January 2020. The author synthesized and analysed the results obtained from earlier studies to answer the following research questions:

First question: what do we see from recent mobile banking studies?

Second question: besides mobile banking adoption studies, which themes have been investigated?

The contribution of this research includes: Firstly, the research presents a comprehensive review of mobile banking studies: over time, research themes, scientific journals and investigated regions. Secondly, the study provides a deep descriptive literature review with two important themes in mobile banking which have been

neglected by previous literature reviews. Lastly, the research points out the important findings from the previous studies and the shortcomings in the topic of mobile banking, which can be used to promote further research. These contributions make this study unique and valuable.

This review paper has been organized in the following way: Section 2 is concerned with the methodology used for this study. Section 3 highlights overall insight of mobile banking research and provides in-depth understanding into themes and subtopics. Section 4 presents the conclusion and academic and practical contributions. Lastly, Section 5 contains limitations and further research directions.

METHODOLOGY

The descriptive literature review approach was used in this study covering the period from 2011 to January 2020. The past decade has seen the rapid development of internet broadband and the new generations of 3G and 4G mobile networks, as well as the continuous innovation of smartphones, all of which have greatly supported the development of MB. Furthermore, there is no doubt that MB services have developed beyond sending codes by SMS. Therefore, the 10-year period from 2011 to 2020 allows us to reflect the up-to-date research trends about MB. This study uses a descriptive

literature review in order to gain insights into the state of mobile banking research (King & He 2005). In this research, mobile banking refers to a product or service provided by a bank or a microfinance institute (bank led model) or MNO (non-bank-led model) through using mobile devices (Shaikh & Karjaluo 2014).

Firstly, the search process was conducted based on searching in databases: Scopus and the Web of Science (WOS). Searching for terms such as "mobile banking" "m banking" "m-banking" in the title, the study found 620 articles in Scopus and 219 articles from the Web of Science. Next, criteria for selecting articles were as follows: published between 2011 and January 2020, in English language, where the document type is article. The primary inclusion criterium for selecting published articles was ensuring the best quality of data because most of them have passed the peer-review requirement for publication. As a result, the author obtained 528 articles. Then, the author chose articles in the subject area of business, management, and accounting. As a result, 270 articles went on to the next round of screening. After that, 79 papers were excluded due to duplication, leaving 191 articles. Then only accessible articles were selected in the next stage; therefore, 34 research papers were rejected (leaving 157 articles). Finally, based on a review of the abstracts, we rejected 2 articles on the topic of technical matters in mobile banking. The remaining 155 articles were used for the descriptive literature review.

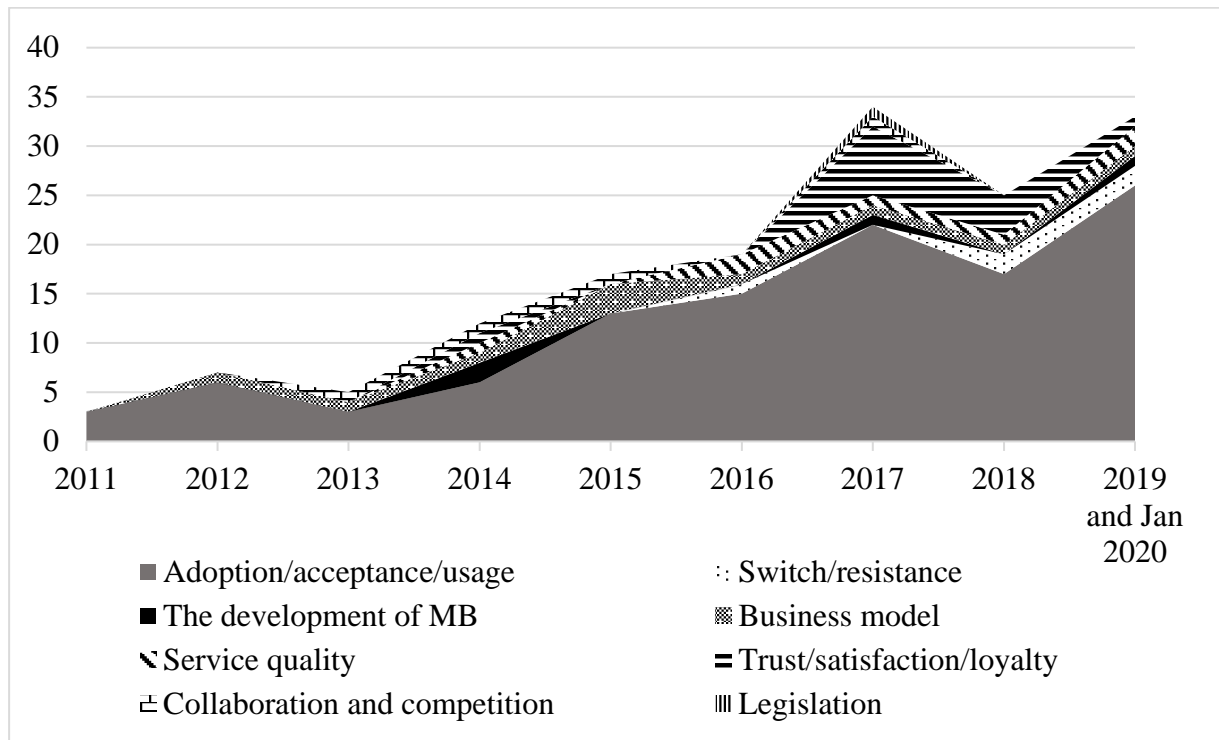
Table 1
Steps for selecting articles

Step 1: Search with Title	TITLE ("mobile banking" OR "m banking" OR "m-banking")	No. of rejected articles
Result	SCOPUS: 620 documents WOS: 219 documents	
Step 2: Filter with "year/ language/ document type"	Year publication = 2011-2020 Language = English Document type = articles	331
Result	SCOPUS: 324 articles WOS: 184 articles	
Step 3: Filter with "subject area"	Subject area= "business, management, accounting"	238
Result	SCOPUS: 175 articles WOS: 95 articles	
Step 4: Filter with "Duplicate"	SCOPUS + WOS = 191 articles	79
Step 5: Select accessible papers	SCOPUS + WOS= 157 articles	34
Step 6: Abstract reading for relevance	SCOPUS + WOS= 155 articles	2

DISCUSSION

The descriptive literature review method combining the statistic summaries provide the comprehensive synthesis of mobile banking research.

Current state of mobile banking research



Source: Own calculation

Figure 1. The number of publications on mobile banking topic

From the data in Figure 1, it is apparent that the number of publications on mobile banking research has increased dramatically during last 10 years. The increasing trend of mobile banking articles has demonstrated the higher interest in this topic. The single most striking observation to emerge from the data comparison was that the number of publications from 2017 to January 2020 made up of 60% of total publications (with 92 articles). Surprisingly, the majority of articles concentrated on individual adoption and customer behaviours such as adoption/acceptance/usage (72%). Recently, some

studies have emerged that pay attention to switching or resistance behaviour intention of customers in using mobile banking services. This research trend reaffirmed that mobile banking services are considered a customized service, as a result, the perception of customers will play a pivotal role in the success of this mobile service. However, only a minority of papers have approached mobile banking from the macro level (the development of MB and its legal aspects) and industry level (business model, collaboration & competition, service quality).

Table 2: Journals publishing mobile banking research (2011- January 2020)

Journal	Number	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Percentage
International Journal of Bank Marketing	24				1	3	5	9	2	4		15.5
Journal of Internet Banking and Commerce	11	1	3	1	2	1	3					7
International Journal of Business Information Systems	6						1	3		2		3.87
Journal of Islamic Marketing	5				1				1	3		3.22
Journal of Retailing and Consumer Services	5							1	1	2	1	3.22
International Journal of Electronic Finance	4					3			1			2.58
Global Business Review	3							1	1	1		1.93
International Journal of Business Innovation and Research	3				1	1				1		1.93
International Journal of e-Business Research	3	1						1	1			1.93
Internet research	3	1						2				1.93
Journal of Business Research	3						2		1			1.93
Journal of Enterprise Information Management	3						1			2		1.93
Journal of Financial Services Marketing	3					1		1	1			1.93
Journal of Global Information Management	3								2	1		1.93
Marketing Intelligence and Planning	3		1		1	1						1.93

Note: Journals with at least 3 articles in Mobile banking (own calculations)

A total of 155 articles about mobile banking have been published in 83 scientific journals. However, they are mainly concentrated in 20 journals with 92 articles (around 60%). The two journals with the most

articles on mobile banking are the *International Journal of Bank Marketing* (24 articles) and the *Journal of Internet Banking and Commerce* (11 articles).



Source: Own calculation

Figure 2. Mobile banking research by country

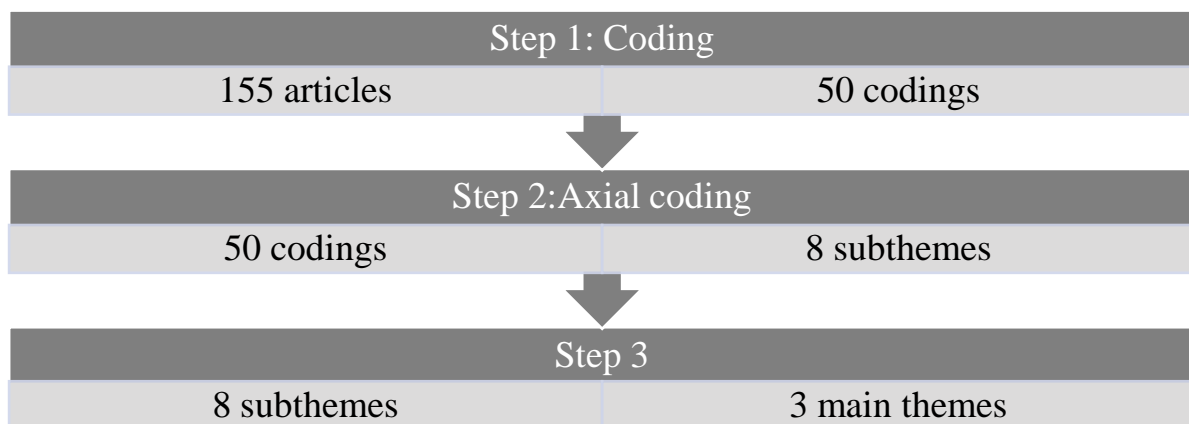
Only 31 studies were conducted in developed countries¹. Most of the research on mobile banking has been concentrated in developing countries. Some regions have attracted particular attention from researchers, such as South Asia and Southeast Asia. Especially such countries as India, Malaysia, Brazil and Pakistan have the highest number of publications on the topic of mobile banking (61 out of 155 studies).

Themes in MB

The classification in the MB study was prepared using the 155 studies retrieved above. Firstly, the author

carefully read through each study and coded it. This approach was adopted to allow deeper insight into the main theme of each article, even though this process takes a long time. , for analysis, 50 codings from 155 articles were extracted. Following this process, 8 subthemes in mobile banking research were identified using axial coding. Finally, the classification of mobile banking research studies was categorised by three main themes: macro approach, industry approach, and individual approach.

The advantages of this classification method are that it allows us to identify and characterize the purpose of each research study, even it takes time.



¹ Members of OECD are lassified as developed countryies. <https://www.oecd.org/about/members-and-partners/>

Figure 3. The steps in classifying the mobile banking topic

This study brings a comprehensive view to the knowledge of mobile banking research by identifying two more important themes in mobile banking – macro approach and industry approach. Consequently, after

presenting an overview of mobile banking research in Part 1 this study focuses on descriptive qualitative analysis with the macro approach theme and the industry theme.

Table 3
Themes in mobile banking research

Macro approach	Industry approach	Individual approach
Development of MB	Business model	Adoption/usage/acceptance
Legislation	Collaboration & competition	Satisfaction/trust/loyalty
	Service quality	Rejection/resistance

Macro approach

Development of mobile banking

Mobile banking from the macro aspect has not received enough attention from researchers. Only three studies were conducted in the theme of the macro approach out of 155 studies. This is a modest number. These studies concentrated mainly on the development of mobile banking in developing countries (Gómez-Barroso & Marbán-Flores 2014; Nguena 2019; Van Der Boor et al. 2014). It is important to affirm that the trend of mobile banking development in recent years is obvious (Moser 2015). Approximately 85% of innovation services such as mobile banking, mobile payment, mobile money, or telecom services have risen in developing countries. Firstly, fulfilling the growing demand in developing countries is a contributing factor in the emergence of mobile banking (Van Der Boor et al. 2014). The existing needs of the poor in developing countries stems from limited access to finance, low level of education, and underdeveloped technology infrastructure (Van Der Boor et al. 2014). After that, these mobile banking services continue to expand to developed countries.

M Pesa a banking service on mobile phones in Kenya is a clear example of success in developing mobile banking services. Recent research has shown that there are two circumstances for explaining this success in Kenya: internal factors and external factors. According to Gómez-Barroso & Marbán-Flores (2014), firstly these services themselves offer a method that is simple and understandable to most people for managing their financial transactions. Secondly, the context of a largely rural population with a low level of education living far from urban areas presents a great demand for access to finance. More importantly, a factor that cannot be excluded is the support from the central bank of Kenya (Gómez-Barroso & Marbán-Flores, 2014). Macro factors have been found to influence the development of mobile banking services: domestic credit, human capital, remittances, trade openness, credible monetary policy, and infrastructure (Nguena, 2019). Among these, human capital has the greatest impact. These findings suggest that the development of mobile banking not only comes from fulfilling the needs of customer aspects but also from policy factors. As a

result, countries need to have a consistent and transparent monetary policy, improve their infrastructure, develop financial literacy, and provide education to promote digital financial services.

Legislation

Mobile banking brings many opportunities for both banks and customers. However, it has some challenges. For mobile banking providers, the major challenge is related to security risks and privacy risks when deploying mobile banking (Ashta 2017). For users, risks related to the theft of personal financial information are the biggest concern (Wonglimpiyarat 2014). When addressing these risks, the legislation aspect cannot be neglected. Ashta (2017) argued that despite obvious benefits from mobile banking, some inherent risks in mobile banking should be taken into consideration such as risks arising from banking operations, telecommunication companies, and mobile banking applications. One obvious characteristic of risk in mobile banking is that these kinds of risks are related to both mobile banking providers and telecommunication providers. For example, the billing risk and identification risk occur when customers use mobile banking to pay for telecom or type the wrong phone number of recipients. Therefore, this study suggested that regulations should be involved with all market players to reduce these risks. In particular, there should be regulations related to the establishment of strategic alliances and acquisitions between telecom operators and banks (Reeves & Sabharwal 2013). In the future, when mobile banking is part of the mobile ecosystem of the economy, there should be more standard regulations in banking transactions for participants as a consequence of more risks involved and existing interoperability (Wonglimpiyarat 2014).

This study found that firstly there are very few studies showing the factors affecting the development of mobile banking at the macro level. There is no comparative study among countries on the development of mobile banking. Secondly, there are few studies evaluating the effect of regulation on the development of mobile banking. Because of this, there is a need for more evidence on whether a legislation orientation from governmental authorities affects the development of

mobile banking. Moreover, there are no studies to assess the impact of mobile banking on social development. Whether mobile banking contributes to poverty reduction as well as improvements in making financial services more inclusive is unclear. Unfortunately, although Ashta's study (2017) mentioned some related risks of mobile banking, previous studies in the macro approach have not dealt with this topic in mobile banking research.

Industry approach

a) Business model

Only 10 studies out of the 155 have investigated mobile banking from the business model aspect. These studies have attempted to evaluate the benefits from MB services to providers (Amran et al. 2019; Onay & Öztaş 2018; Parvin 2013), MB implementation (Ketkar et al. 2012; Mullan et al. 2017), the competitive strategy (He 2015), business model innovation and ecosystem of MB (Osmani et al 2017; Moser 2015; Mustafa 2015; Tingary & Mahmoud 2014).

Benefits from MB services to providers

Parvin (2013) drew an overview of mobile banking services in Bangladesh and observed that mobile banking services were quite new to both banks and customers in Bangladesh. Initially, some banks implementing MB did not actively develop mobile banking services even though the benefits and prospects of mobile banking services are recognized by users. A possible explanation for this might be that mobile banking service is a new type of service, so it takes time to prove its superiority over other services. After that, banks realized providing mobile services was irreversible. The major advantage of MB deployment is cutting operational costs and meeting the growing customer demand (Parvin 2013). Moreover, providing MB services allows banks to improve their financial situation by managing tracking assets and liabilities, helping to add revenue from providing added-value services to existing customers, and attract more customers (Onay & Öztaş 2018). Mobile banking not only benefits banks but also microfinance institutions. Through using mobile banking, lending and collecting repayment activities are more transparent while risks of debt collection are reduced, thereby enabling loans to the poor (Amran et al. 2019).

MB implementation

MB is considered as a banking service offered on mobile devices, so the success of this service depends on how the market responds and the way a bank effectively coordinates its resources in service delivery. To find the stakeholders' perspective, Mullan et al. (2017) surveyed stakeholders and listed two main reasons why a bank had decided to implement a mobile

banking service. The first is external factors: global mobile phone penetration, customer demand, and stakeholder partnership. The second is internal factors: customer convenience, the competitive advantage for banks, the strategy of banks, and low perceived risk concerns. The findings of Mullan et al. (2017) seem to be consistent with those of Ketkar et al. (2012), who concluded that mobile banking providers need to pay attention to technological factors and infrastructure to ensure that the transaction on MB is fast with low cost. Moreover, telecommunication network coverage should be good enough to demonstrate the advantages of MB by being able to conduct financial transactions anywhere at any time. A comparison of the findings with those of Osmani et al. (2017) confirms that security infrastructure was the most important feature to explain why a bank implements mobile banking services. Other aspects such as legal and socio-economic issues and flexibility in technique should be considered as the top concern of banks. These conclusions bring a clearer view of the application of mobile banking. These findings indicate that banks should have effective and comprehensive strategies of providing mobile banking services by analysing all related stakeholders such as customers, telecom, partnerships and utility companies as well as the banks' strategic orientation.

Competitive strategy

In the aspect of competitive strategy, He (2015) found that the more competitive the market is, the more banks applied MB to compete through price. In contrast, in a centralized market, banks tended to apply MB to enhance technology and improve customer experiences.

Business innovation model and ecosystem of mobile banking

Broadly, banks' managers should think of mobile banking in the context of a business innovation model (Mustafa 2015). Moser (2015) revealed that the trend of implementing mobile banking channel is increasing among banks, and in the near future social networks and mobile banking could be integrated. Through the analysis of mobile banking services in Pakistan, it is suggested that mobile banking should be studied in a broader scope than traditional service. The discussion of mobile banking should be mentioned in the scope of the ecosystem of the business model (Mustafa, 2015). Banks need to discuss with relevant stakeholders such as mobile operators, end-users, technology vendors, call centres, retailers and utility companies. As a result, these associated members allow banks to establish a connecting network which is called the ecosystem of mobile financial services (Mustafa 2015).

b) Collaboration and competition

The trend in cooperation and competition among MB providers has been investigated by a number of

researchers (Lee et al. 2015; Reeves & Sabharwal 2013; Shaikh et al., 2017; Wonglimpiyarat 2014).

To address financial exclusivity among the poor, Reeves & Sabharwal (2013) suggested the establishment of cooperation between mobile network operators and microfinance institutions. These mobile network operators help financial service providers deliver their services at a lower operating cost, meanwhile, customers could save from using mobile banking. Consequently, mobile companies provide more value-added services, while microfinance services can expand their customer base. In the development of mobile banking, competition and cooperation exist almost parallel to each other (Lee et al. 2015).

To better understand the collaboration and competition in mobile banking services, Wonglimpiyarat (2014) analysed a case study in the Thailand market and discovered that strong competition forces mobile banking providers to seek strategic alliances (network collaboration) to offer innovative solutions. Furthermore, this study suggested that building up strategic alliances could benefit mobile banking providers when these collaborations not only help banks provide more value-added services to their customers, but also upgrade the core banking system and expand the e-banking channels.

In Korea, using actor-network theory (ANT), Lee et al. (2015) attempted to analyse the development stage of mobile banking in Korea. This study found that the interaction between members in the market changes over time, and technology plays a leading role in the stages of mobile banking development, acting as a key player in the actor-network analysis. At an early stage, “the technology was under the control of mobile carriers because the services could be offered without involving mobile phone manufacturers” (Lee et al. 2015, p. 158). In the next stage, when IC chip technology-enabled enhancing mobile banking services, banks began to participate and later created competing actor-networks in mobile banking through competing to control customer information. In the next phase, smartphones allow mobile banking providers to develop their applications, regardless of the technology from mobile operators. Thereby, this study revealed that to be the winner of the mobile banking race, banks need to identify and understand the current and future technology development trends. Secondly, banks should choose the right partner to develop together. Thirdly, the market will become more expanded with many new players, including new competitors or partners from the same industry or other industries.

One of the limitations with mobile banking is that users are required to register an account at a bank; as a result, it is very costly to conduct a payment between a mobile banking account with another non-banking account (such as an electronic wallet). To meet the needs of both banking and commercial transactions, Shaikh et al. (2017) proposed a conceptual model in which banks, telecom, startups, and fintech are combined to create a system called an MBPS (mobile banking payment

system) as a combination of mobile banking and mobile payment. However, to have effective cooperation, this study emphasized that not only strengthening financial literacy but also strict legal provisions for cooperation should be taken into consideration. This proposal further supports the idea of Tingary & Mahmoud (2014), who also suggested that to facilitate the collaboration among all concerned parties legislation should be clearly and sufficiently orientated.

c) Service quality

Only 7 out of the 155 studies concentrated on MB service quality. These studies mainly investigated the determinant of MB service quality and the relationship among MB service quality, satisfaction & loyalty, and trust (Jun & Palacios 2016; Kapoor & Vij 2020; Nisha 2016; Puriwat & Tripopsakul 2017; Sagib & Zapan 2014; Shankar et al. 2019; Zoghلامي et al. 2018). Among the theories used for investigating service quality, servqual was found to be the best theory to explain variance in mobile banking service quality (Shankar et al., 2019).

The findings from researchers on the service quality topic suggested that factors of service quality have positive impacts on customer satisfaction. By adopting the theory from service quality such as e-squal; servqual; servperf mobile service quality, most studies affirmed that such factors as reliability, responsiveness, efficiency, security/privacy and empathy have great influence on customer satisfaction (Nisha 2016; Puriwat & Tripopsakul 2017; Sagib & Zapan 2014; Shankar et al. 2019; Zoghلامي et al. 2018). Of the factors, reliability is the most common factor found in these studies. Due to the characteristics of service delivered through mobile applications, factors affecting the quality of apps also affect the quality of MB services such as content, accuracy, ease of use, speed, aesthetics, security and unique mobile application service features (Jun & Palacios 2016). Additionally, users highly appreciate mobile banking applications when they perceive that these applications are well designed in terms of content, informative, have a fast response time and low latency (Kapoor & Vij 2020).

From an industry perspective, the application of new technologies to the provision of banking services such as mobile banking has surpassed the limit of a mere service. Studies have shown that the benefits of mobile banking are enormous and related to many concerned parties such as suppliers, customers, technology providers and mobile phone companies. These participants form an interconnected ecosystem in which the competition and cooperation among participants change quite dynamically according to the evolution of technology development and the participation of fintech companies. In summary, no studies in the industry theme evaluated the impact of mobile banking on the financial performance of banks or their market share. The assessment of service quality with mobile banking

has identified several factors found to affect the quality of MB services.

CONCLUSION AND CONTRIBUTIONS

Conclusion

Firstly, this study briefly presents the research trends of mobile banking over the recent decade. The last decade has witnessed an increase in the number of MB studies, which mainly focus on the individual level. Most of the studies are on customer adoption/usage/acceptance. The number of studies on the macro approach and industry approach in mobile banking is modest. MB studies are spread across many countries and regions but focus mainly on developing countries, especially South Asia and Southeast Asia. Quantitative research is the dominant method in mobile banking research.

Secondly, some evidence released from previous studies shows that the development of mobile banking was contributed to by both the advantages of MB and demand from developing countries.

Lastly, future development trends in mobile banking are obvious and reaffirmed by many studies. There will be more mergers and acquisition (M&A) activities and cooperation or alliances between banks and fintech, and between banks and telecommunication providers in providing mobile banking services. In the future, the MB market will witness participation from new startups and non-bank financial institutions, which may come from the financial industry or other industries. This research literature review has not been able to identify a single study that evaluates the impact of big tech companies such as Facebook, Amazon, or Alibaba on mobile banking services. These big tech companies are expanding payment activities (even creating cryptocurrencies) that will surely have a great impact on the traditional banks' mobile banking service. The expansion of players in this market will be accompanied by related risks and challenges. The boundary of mobile banking will depend greatly on the approach of the legal framework in each country.

Academic contribution and practical implications

This study has summarized all research on mobile banking in the last 10 years, as well as provided researchers with a comprehensive picture of mobile banking topics. Therefore, the study has aimed to increase academic knowledge of mobile banking

research. Firstly, the study has synthesized a large number of studies on mobile banking published in journals indexed in Scopus and Web of Science on mobile banking to produce a clear research trend, research topics, number of articles, and research area for the last 10 years. Secondly, the findings from this study contribute to the literature review stage for future studies to shorten the time for synthesis and analysis. Thirdly, despite much attention to individual approaches, there is still room for future research with the macro approach and industry approach.

In practical implications, it suggests that the developing trend of mobile banking has been affirmed by many studies. Most of them predict in the future there will be more collaboration and acquisition among banks, fintech, and startup companies because of increasing competition and technological advantages. The conclusions from this research may help bank managers have a clearer view of the service development model for the future scope of mobile banking.

LIMITATIONS AND FURTHER RESEARCH DIRECTION

Firstly, the research has collected published articles from two large databases, Scopus and the Web of Science. However, other mobile banking studies may be ignored. Therefore, future research may further expand the scope of the search to draw a more general and complete picture of mobile banking research.

Secondly, this study provides a literature review on mobile banking, but this research only evaluates studies on the fields of economics and business. Technical articles related to mobile banking are not considered in this study, which is one of its limitations.

Thirdly, mobile banking is growing, and as a result, more players are arriving from banking industries or other industries. Unfortunately, no study has attempted to examine the participation of big tech companies in the mobile banking market. Future studies with banking services can be conducted on a larger scale, not only with mobile banking but also with digital financial services.

Lastly, there are few studies on mobile banking in terms of the macro approach, industry approach, and legislation approach. There is a gap in research on the firm-level and macro approach with mobile banking. Assessing the impact of the mobile platform on the performance of banks requires new research. Each country has its own cultural factors and population structure; therefore, it is necessary to have a better assessment of the factors that influence the decision to adopt a mobile platform from the firm level of each country.

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