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**Mobile financial services –  
Introduction, definition, and conceptualization**

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**Abstract**

Incumbent business models in banking and payment are continuously challenged by new competition and evolving consumer expectations as banking and payment landscape have increasingly moved digital and mobile. Mobile financial services (MFS) and related technologies encompass a broad range of digital (including mobile) devices, channels, and financial transactions that consumers execute on their mobile phones or tablets. This chapter conceptualizes the term 'MFS' and investigates what constitutes the field of MFS. The chapter seeks to answer the following research questions: What is mobile financial services landscape? What are MFS and how they have been conceptualized in the marketing and IT literature? How prior literature has segregated MFS? How these types of MFS differ from each other?

*Keywords:* Mobile financial technologies/services; conceptualization, mobile banking; mobile payment; branchless banking

**Introduction**

Over the last two decades, research and practitioners have paid a huge attention in understanding and examining innovative mobile financial technologies and services. The underline reason of this devotion from the research and the industry is attributed to the momentous shift seen in the technological culture and the rise of the smart phones. Because of the availability and affordability of smartphones and tiny but smart wearables, customers are now more empowered, have endless virtual and physical options for accessing information, researching, choosing, buying, as well as using new financial and payment products and value-added services at the convenience of anytime anywhere.

This rapidly converging financial landscape was earlier dominated by the branch-oriented banking providing services to customers maintaining a formal relationship (bank account) with the banks. Paper-based instruments such as checks, payment drafts dominating the transactions mode and the transactions cycle completed in days. The rise of the digital-natives during late 1980s, birth of the internet and internet-based business models during early 1990s, mobile technology, and the retail agent network (in case of branchless banking) have transformed delivery of financial services. Internet banking, point-of-sale banking, and telephone banking were introduced and added to the repertoire of banking channels. These innovative banking channels, commonly known as 'alternative delivery channels' or 'digital banking channels', became the lingua franca of banking business globally.

Historically, these developments in the domain of digital banking were originally started in the 1960s and received a tremendous momentum during late 1980. The climax was in 1990s, and slowly eroded the need for branch oriented banking. In 2000s, portable and wearable devices have brought a major revolution in the consumer mindset and lifestyle in general because of their massive social and economic impact (Liébana-Cabanillas et al., 2014). Similarly, digital banking channels including mobile were developed and deployed in most of the developed world. Later on, their deployment and usage has been noticed in emerging and developing countries as well. Perhaps, this diffusion of financial digital services including MFS in the developing markets is essentially due to the increasing usage of smartphones as well as the presence of digital native segment.

According to Helsper and Eynon (2010), the digital natives (also known as net generation, the Google generation, or the millennials) are those consumers or users who were born during late 1980s and have always been surrounded by, and interacted with, new technologies such as mobile. On the other hand, the people who were born before this new digital era, which began around 1980, are called 'Digital Immigrants' (Helsper and Eynon, 2010). According to Prensky (2001), digital immigrants may learn to use new and innovative technologies but will still be in some way located within the past, unable to fully understand the digital natives

In tandem with these global advancements seen in the mobile technology, the financial institutions located in emerging and developing countries started developing mobile-based innovative solutions and offer retail mobile financial banking services to more heterogeneous,

demographically dispersed, and relatively less-privileged population. A significant impediment to reaching remote customer segment was the non-availability of infrastructure, high security risks, and low deposit rate. The adoption of mobile telephony to provide financial services in Africa and other developing regions of the world has become instrumental in integrating the hitherto less-inclusive or unbanked and underbanked segments of the population to the mainstream financial systems (Ouma et al., 2017).

Earlier, the strategy to reach the underbanked and unbanked was the part of financial inclusion programs, which were introduced and motivated by the Government agencies and regulators. These financial programs were undertaken by banks, other financial institutions, and mobile network operators (MNO), and retail agent network with an underline purpose to increase the financial and social inclusion, increase the financial well-being of the underbanked (and even unbanked consumers), and entice the customers to access and use the mainstream banking and payment services. These developments have gradually designated 'mobile' as absolutely necessary for many banks, MNOs, and other non-banking institutions.

Despite these developments and the availability of extensive literature on MFS, there has been no effort to date to comprehensively define and conceptualize the term 'MFS.' This chapter extends the depth of previous studies and demonstrates the need for defining and conceptualizing the term 'MFS' and investigating what constitutes the field of MFS. In doing so, this chapter provides an analysis and synthesis of the past literature in the field of MFS. Because the prior research has not defined the term 'MFS' - at least until recently, researchers often overlook the potential of MFS, especially the branchless banking. The chapter seeks to answer the following research questions:

- What is Mobile financial services landscape?
- What are MFS and how they are conceptualized in the marketing and IT literature?
- How prior literature has segregated MFS into different types?
- How the different types of MFS differ from each other?

Attention is given to the contemporary and relevant published sources including journal articles and conference proceedings published during the last decade i.e. 2008 till 2017 (Inclusive) defining and conceptualizing the term 'MFS'. Within the broader scope of this

conceptualization, we have used the term ‘mobile financial services’ or ‘mobile banking services’ or ‘retail mobile financial services’, or ‘mobile banking and payment services’ interchangeably.

The chapter is organized as follows: the next section offers the definition and conceptualizes the term ‘MFS’ and its different facets. This will be followed by a discussion on how to differentiate the terms mobile banking, mobile payments, and branchless banking services. The chapter ends with a conclusion.

### **Mobile financial services Landscape**

This section addresses the first research question: What is Mobile financial services landscape?

The retail banking sector is considered the backbone of the financial services industry, economy, and it permeates different realms of social, private, and economic life. Retail banking fulfills everyday banking and payment needs of the consumers and encompasses high-volume and low-value transactions. Retail banking sector facilitates both electronic and paper-based transactions, and it includes a horde of delivery channels with variant capabilities to promote, for example, financial inclusion as well as the financial well-being of the customers. Historically, the development and the deployment of these multiple digital banking delivery channels by the financial companies including banks is based on a very simple notion, i.e., the bank-customer relationship build on interaction between the partners and should not (metaphorically and literally) end at the bank branch door (Feinberg et al., 2002).

Mobile devices have added the element of pure mobility to digital services consumption and have provided motivation and several business opportunities to the retail financial sector to expand their business portfolio. Resultantly, the widespread penetration and use of portable devices as an information-rich tool created a new payment environment, a new revenue stream for banks, and became a central payment business strategy. Using the functions of the cell phones – payment - mobile financial systems became the next big thing and an ultimate choice for the consumers.

Figure 1 depicts the landscape of the retail MFS and how these services are segregated in different types by the research and the industry. Figure 1 segregates the consumers (such as banked, de-banked, and un-banked) who access and use the MFS. These segregations are largely based on the evidences collected from the prior research (e.g., Demirgüç-Kunt and Klapper, 2013) that have identified two functional domains in the financial system: 1) More-inclusive mobile financial systems 2) Less-inclusive mobile financial systems.

[Insert Figure 1 about here]

More inclusive mobile financial systems include mobile banking and mobile payments including its advanced version called mobile wallets. Banked and de-banked consumers with an easy and always access to the infrastructure, internet, and mobile devices are generally considered as inclusive consumer base. On the other hand, a less-inclusive mobile financial system consists of branchless banking or mobile money. Here un-banked and under-banked consumer using their cell phones performs basic banking and payment transactions. Since banks could not manage the mobile network by themselves, mobile money services allow greater collaboration between and among various banking and non-banking players such as mobile network operators (MNOs), software houses, and newly emerging Fintech startups.

There have been some assertions that the MFS including more-inclusive and less-inclusive provide several benefits to the consumers, such as, MFS provide more personalized experiences, better customer service, reduced costs, the increased reactivity of the bank and other financial institutions, increased market share, reinforced brand image, and provide unbanked with new opportunities to access financial services (Morawczynski, 2009). Furthermore, Kumar et al. (2017) discussed wider benefits from using MFS such as increasing customer satisfaction, increasing profitability, sustaining competitive advantage, providing a higher level of convenience, and also as a tool to cater to 'unbanked' customers.

### **Mobile financial services – definition and conceptualization**

This section addresses the second research question: What are MFS and how they are conceptualized in the marketing and IT literature?

Mobility is the cornerstone of the MFS. It refers to the higher degree of independence from space and time achieved in banking and payment processes by the employment of mobile devices (Fenu and Pau, 2015). MFS was developed in the backdrop of 'mobility,' introduced a new breed of consumers popularly known as 'always-on' or 'always-connected' as well as introduced new trends in the financial sector, revolutionized the payment mechanisms, and allowed the development of mobile-based banking and payment solutions. On the same lines, the portable or mobile devices have become an inseparable component of consumer life. Against this transformation, the banks are designing new marketing strategies to entice customers including banked and unbanked using MFS.

According to Duncombe (2012), MFS is an umbrella term that incorporates mobile cash transfers and payments, and other financial transactions undertaken using portable devices such as mobile phones and tablets. In the understanding of Dass and Pal (2011), MFS encompasses a broad range of financial and payment transactions that consumers engage in or access using their mobile phones or tablets. McKinsey & Co. (2017) argue that these mobile financial transactions include the full spectrum of financial services ranging from payments and current accounts to savings, loans, investments, and insurance. Here, MFS are classified in three major but overlapping types: m-banking, m-payment, and the latterly included branchless banking or mobile money, which until now considered the subset of m-payments.

Most scholars who have identified and endorsed the classification within the MFS (e.g., Petrauskas and Zumaras, 2008; Selvadurai, 2014) concur that this classification is due to different consumer preferences and access methods to information, size or the volume of the transactions or payments (retail payment or wholesale payment), nature of the transactions (Financial and non-financial), the time of payment (pre-paid, post-paid), the place of purchase (real-time, online), the medium of payment (paper, electronic, mobile), and the method of payments (point-of-sale, proximity payments, remote payments).

### **Major types of mobile financial services**

In this section, we will address the second research question by discussing how prior literature has segregated MFS into different types such as mobile banking (m-banking), mobile payment (m-payment), and branchless banking.

## *M-banking technology and services*

The most extensively researched area within the MFS is m-banking. By collecting and analyzing the contemporary scientific literature including journal articles and conference proceedings, we have identified and summarized 27 definitions proposed by the research on m-banking (See Table 1).

[Insert Table 1 about here]

The definitions of m-banking (Table 1) suggest that prior research has considered m-banking a multi-variant service in terms of application that falls under many domains. For instance, Riivari (2005) considered m-banking as a new marketing and CRM tool whereas Shaikh (2016) considered it as a successful business-to-consumer application. Research has additionally considered m-banking as a sub-set of mobile commerce (Mehrad and Mohammadi, 2016; Tam and Oliveira, 2016), an important information system (e.g., Luo, Zhang, & Shim, 2010); an extension of e-payment system (Schierz et al., 2010), an innovative banking channel (Chawla and Joshi, 2017), and a subset of electronic finance (e.g., Ratten, 2012). Chung and Kwon (2009) discuss m-banking from the perspective of convergence of mobile technology and financial services. Baptista and Oliveira (2015) state m-banking to be a vital electronic banking channel.

In addition to SMS-banking, prior literature has referred the term m-banking as cell phone banking (Masrek et al., 2014), smartphone banking (Park et al., 2014), pocket banking (Amin et al., 2006), WAP Banking (Ratten, 2008), m-finance (Donner and Tellez, 2008), and digital banking (Olanrewaju, 2014).

The earlier variant of m-banking known as SMS (short-message-service) first appeared during the late 1990s (Birch, 1999) when banks located in Scandinavian countries started offering financial services to mobile handsets. These mobile-based financial services were at the beginning related to notifications such as sending customers balance alerts. The first m-banking service was developed and introduced in Finland during early 1992 (Barnes and Corbitt, 2003). This first-ever m-banking application allowed the bank customers of MeritaNordbanken (later known as Nordea Bank) to make utility bill payments and check



account balances using a cell phone. Further review of the past literature (e.g., Chawla and Joshi, 2017) reveals that the first self-service technologies in the world emerged in the 1970s when banks deployed ATMs. This was followed by telephone banking services introduced in the 1980s and emergence of television, internet, and early browser based version on m-banking called WAP-banking in 1990's (Suoranta and Mattila, 2004). After the development of smartphones in 2007 (notably the launch of the first iPhone), m-banking services transformed radically and allowed a host of innovative and value-added services via mobile applications (apps) that can easily be downloaded onto smartphones. These developments have largely inverted other banking channels such as telephone and SMS banking.

M-banking is defined as the execution of banking services to conduct financial and non-financial transactions on mobile phone or tablet (Veríssimo, 2016; Shaikh et al., 2017). M-banking offers an element of ubiquitousness as well as increased convenience and low cost transactions for the consumers (Luo et al., 2010). Lin (2013) considers m-banking a subset of m-commerce facilitating consumers to conduct both conventional banking transactions (such as balance checks and fund transfers) and more advanced banking transactions (such as insurance and portfolio management services). Gu et al. (2009) treat m-banking as a 'salient system' considering its unique attributes as ubiquity, convenience, and interactivity. M-banking is often used to refer only to customers with bank accounts and m-banking services cover various transactions on a bank customer's mobile phone. Despite the definitional divergence, a relative consensus is found in the literature that sees the m-banking as the provision of banking services on portable devices anytime anywhere.

M-banking benefits the consumer through anytime, anywhere banking convenience (time and location independence), with increasing ubiquity, immediacy, value-added banking service, low-cost banking, time optimization, immediate information, instant connectivity, and interactivity (Akturan and Tezcan, 2012). For the banking and financial institutions, the benefits of introducing m-banking include an additional source of revenue, better efficiency and improved service quality, better customer relationship management, and better security.

The access methods in m-banking, however, differ from one demographic location to another and it largely relies on technologies and communication protocols for providing banking services (e.g. transfer of funds), and related enquiries (e.g. searching for the closest ATM location) to demographically dispersed population (Oliveira et al., 2014). In most of the

developed markets, m-banking applications provide various innovative, secure and high-value banking services and support to consumers. The banking companies and other financial institutions located in the global south in developing and low-income countries are leveraging their experience and offering m-banking applications in addition to SMS notifications and various alerts. Therefore, the m-banking applications are also gaining popularity in emerging and developing countries.

In sum, m-banking is considered as one of the core components of the retail MFS sector, and it has rapidly emerged as the most preferred and separate bank channel by banks and customers, a powerful CRM tool used to build loyalty and mutually rewarding relationships with customers.

#### *M-payments technology and services*

One promising area of m-commerce that is receiving attention globally from consumers to merchants as an alternative to using cash, check instrument, or payment cards is *mobile payment* (Oliveira et al., 2016). According to Allied Market Research (2017), the global mobile payments market is estimated to reach \$3.388 trillion by 2022, growing at a rate of 33.4 percent from 2016 - 2022. Considering its prolific benefits, Nokia Corporation invested USD 70 million in Obopay to enter m-payment market in April 2009; China mobile bought 20 percent of PuDong bank stake in May 2010 to develop m-payment services; Google ventures invested USD 100 million in May 2010 into m-payment business (Yang et al., 2012). The first mobile-based non-cash payment transaction was conducted using a mobile device in 1997 (Dahlberg et al., 2015) when Coca-Cola Beverages Company experimented with vending machines that accepted SMS-based payments in Finland (Dahlberg et al., 2015).

One of the significant observations made while synthesizing the literature of mobile payment is that a radical shift has been noticed where the mobile device was earlier used as a browser, accessing existing internet-based banking and retail systems (known as internet banking) to the use of downloadable mobile application as a payment form, thereby reducing the need for paper-based instruments such as checks, pay orders as well as cash and plastic cards.

According to Thakur and Srivastava (2014) m-payment refers to making payments for goods and services using mobile devices including smart cell phones, radio frequency enabled and near-field communication-based devices. Dahlberg et al. (2015) define m-payments as mobile-based payments for goods, services, information, and bills with a mobile device by taking advantage of wireless and other communication technologies. Table 2 summarizes a host of definitions proposed by the research on m-payment.

[Insert Table 2 about here]

M-payments, also known as mobile wallet, have been divided into two major domains: Proximity and Remote. Proximity, contactless, or on-site m-payment mechanism is largely performed by using various innovative technologies such as Bluetooth, near field communications (NFC), and radio frequency identification RFID (Morosan and DeFranco, 2016; Pham and Ho, 2015) Here the presence of both buyers' and sellers' at one physical location is essential. Remote or off-site payments are performed through text messages, downloadable m-banking applications, wireless payment network requiring wireless application protocol and mobile data exchange.

#### *Branchless banking technology and services*

According to Dermish et al. (2011), branchless banking involves building a payment infrastructure that allows customers and businesses to deposit and withdraw funds and make electronic payments using a portable device such as cell phone from everyday retail stores or agents, thus eliminating the need for bank branches. Branchless banking, also referred to as mobile money, is a supply-side innovation that potentially supports the needs of the poor or unbanked through financial inclusion initiatives that are useful for managing their lives and livelihoods (Duncombe, 2012). Therefore, the notion that branchless banking increases the financial inclusion among the underbanked and unbanked consumer segment in developing countries is substantively important. Despite its growing importance and need, the analysis of the areas covered by the articles included in this review indicated a dearth of published work in the area of branchless banking and similar other areas such as mobile money.

Several titles have been attributed to bank-led and MNO-led branchless banking technology and services. For instance, in Africa, branchless banking is known as 'Mobile money,' 'M-

PESA', mKesk', 'Wizzit.' In Asia, it is known as 'Easypaisa', 'Agent banking'. In emerging markets such as Brazil, branchless banking is known as 'correspondent banking'. In some countries, branchless banking is considered as a variant of m-banking that is conducted through SMS notification on both basic and smartphones with a GSM connection. Figure 2, depicts various branchless banking-based models deployed in various countries. These models have been segregated into two major domains i.e. bank-led and MNO-led. Since banks and other financial institutions are adequately regulated, the bank-led branchless banking models are considered more secure than MNO-led branchless banking models.

[Insert Figure 2 about here]

The growing use of branchless banking in emerging and developing countries is considered inevitable and the most relevant alternative banking channel since most remotely located population segments have no other way to access banking services. Although it is less certain whether large numbers of the unbanked poor will adopt and use this alternative channel for financial services (Pickens et al., 2009), it is generally agreed that branchless banking has facilitated an unprecedented growth in bank outreach especially in Africa and has become a reference worldwide (Jayo et al., 2012). In fact, there is a tremendous opportunity for banking technology to streamline banking processes, connect lower-income citizens at reduced costs and bring millions of consumers to the formal financial marketplace through digital channels such as branchless banking (Diniz et al., 2012).

Mobile money allows financial and non-financial institutions such as MNO to offer banking and payment services outside traditional bank premises. Despite steep challenges for the Government, banks, and other financial institutions, it is considered important to reach the underbanked and unbanked consumer segment when the consumption of formal banking products and services is considered an important pre-requisite to improving economic activities, helping the less privileged to increase their household income, building their asset base, and improving their resilience to shocks (Abramovay 2004; Morawczynski, 2009).

The increasing importance and success of mobile money model are largely attached to the non-access to the formal banking and payment services (such as conventional or branch-oriented banking, ATM banking, Internet banking, and m-banking) to a larger segment of the population also known as 'financial excluded' living in remote areas. This motivates the

banking industry to expand its outreach by developing and deploying banking and payment services which can be conveniently accessed using cell phones by a largely unserved and unexplored consumer segment which is often referred to as the underbanked or unbanked.

In branchless banking the African continent is considered the global leader in mobile money followed by the South Asian countries such as Pakistan and India. According to McKinsey and Co. (2017), over half of the 282 mobile money services operating worldwide are located in African continent. Moreover, there are over 100 million active mobile money accounts in Africa and 40 million active mobile money accounts in South Asia. Majority of these mobile money users in Africa and South Africa are those who have little or no access to a bank branch or ATMs.

Prior research (e.g., Tobbin, 2012; Suárez, 2016) has discussed four reasons that allow the development of branchless banking a different and the most preferred banking channel in low-income countries, and an important alternative for financial inclusion. These four reasons also differentiate mobile money from other domains falls within the MFS. First, remotely-located consumer segments have no other way to access formal banking services and conduct transactions. Second, there must be high rates of mobile phone diffusion. In other words, the number of mobile phone users should long exceed the number of people with bank accounts at a certain location (Tobbin, 2012). Third, there must be a latent demand for financial services (Suárez, 2016). Fourth, the regulatory environment needs to facilitate the banks and other financial and non-financial entities (supply side) while taking into account the possible risks involved when technological innovation is introduced to masses with low literacy and awareness about the financial products and technology (Heyer and Mas, 2011; Flores-Roux and Mariscal, 2010).

### **Differences between the m-banking, m-payments, and branchless banking**

In this section, we address the third research question by discussing how these three types of MFS differ from each other? First, we will bring into discussion the major difference between the first two mobile financial technologies i.e. m-banking and m-payments.

M-banking is always considered a formal digital bank channel which means all the value chain elements i.e. product development and deployment, digital customer service, m-

banking application, and deposit holding is owned and managed by a diligently regulated banking company. M-payment on the other hand follows a less stringent regulatory framework that allows greater collaboration and partnership with non-banking entities. To retain and expand the market share and consumer base, banking companies develop different m-banking and m-payment applications and provide various value-added services to banked and de-banked consumers. To access and conduct m-payment transactions, the user does not necessarily need a bank account. De-banked consumers – those who do not wish to maintain a formal bank account with any bank - prefer to opt and use the m-payment services. Prominent m-payment models include mobile wallet.

Adopting a different perspective, Hepola et al. (2016) consider m-wallet a much-advanced versatile m-payment application. For example, unlike m-banking applications, m-wallet applications can include several innovative elements such as conducting m-payments that contain information related to membership cards, loyalty cards, travel cards and usually also store sensitive and personal information in the form of passports, credit card information, PIN codes, and encrypted online shopping accounts.

Second, when looking at the difference between m-banking and branchless banking, the latter is considered a viable alternative payment service supporting the financial inclusion programs initiated in developing countries as well as providing scalable financial services, markets, and information to the poor. These financial inclusion programs are enabling the demographically dispersed and remotely located population where the presence of bank branches and ATMs are very uncommon. Here mobile money technology and services allow the widespread use of money transfers, credit, and savings (Karippacheril et al., 2013) on a basic cell phone set.

Despite many benefits of using mobile money services, the mobile money transactions have presented regulatory challenges that could potentially hinder their potential benefits (Nyaga, 2014). For example, unlike m-banking that is offered by the banks, mobile money blurs the traditionally distinct and independent sectors of regulation such as telecommunications and financial sectors (Nyaga, 2014). Furthermore, prior research (e.g., Porteous, 2006) has segregated mobile money from other sub-sets of MFS such as m-banking and m-payments by proposing two models, i.e. additive and transformational. Mobile money is largely considered as transformational. The term ‘transformational’ is defined as one of the banking and payment models in which the financial product linked to the use of the phone and is targeted

at the unbanked and underbanked with the largely low-income user. All other MFS are considered additive.

### **Conclusion:**

The underline purpose of this chapter was to present a conceptualization of the term 'MFS' and investigate what constitutes the field of MFS. Globally, the mobile financial services - which are largely seen as convenient extension of services over the phone - are offered by a large portion of banks and financial institutions either as stand-alone or in collaboration with different service providers. Moreover, the term 'mobility' in the MFS is less referred to any specific device and more about providing new opportunities and wider options to augment customer interactions with the delivery channels available now with more to come in the near future (Srinivas et al., 2014).

Two types of MFS, i.e. m-banking and m- payments, dominate the digital retail banking sector. These are largely interconnected and interrelated to each other since they use the cell phone as the primary communication channel. However, the business models, regulatory frameworks, consumer and service concentration, and target market make them distinct from each other. The success of the m-banking in developed countries is largely attributed to an extensive usage of smart portable devices and the availability of infrastructure and communication services offered by the mobile network operators. This infrastructure facilitates an uninterrupted access to the consumers to use the banking services on their cell phones at the connivance of their office and home.

Branchless banking or mobile money services, unlike m-banking and m-payment, provided a different perspective. Our discussion suggests that mobile money was primarily targeted at the underbanked and unbanked population segments with very low-income sources. However, this assertion is now gradually changing. For example, the use of branchless banking is not limited to low-income segments of the population, but other customer segments and income earners are making use of branchless banking financial services due to its simplicity, convenience, innovativeness, and low-cost transactions.

Branchless banking allows customers also without a formal bank account to conduct low-value-high-volume financial transactions, such as deposits and transfers, at designated retail

stores known as branchless banking agents or third-party outlets. These outlets can be a small retailer, a post office, and so forth. In some cases, the mobile network operators also act as an agent as well as co-marketing and branding with banks and other financial institutions.

Therefore, unlike other digital banking channels such as ATMs which require large investments and maintenance costs, mobile money services largely relies on the agent network by providing an alternative banking delivery mechanism using cell phones with a GSM connection. According to GSMA (2017), the branchless banking industry including technology and services is now processing over a billion USD of transactions a day and generating direct revenues of over USD 2.4 billion, which makes the branchless banking a leading payment platform for the digital economy in many emerging markets.

The banking industry and customers have realized the growing importance and necessity of the MFS. Here the development and the deployment of innovative digital banking channels has provided an innovative option for facilitating customers to remotely access and use various banking and payment products at their convenience. This convenience and freedom of choice of accessing and using digital banking channels allows greater levels of customer empowerment (Loonam, M., & O'loughlin, 2008), provide an unprecedented breadth and depth of consumer choice opportunities in a wide range of domains (Broniarczyk and Griffin, 2014).

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## List of Figures

Figure 1: Retail mobile financial services landscape

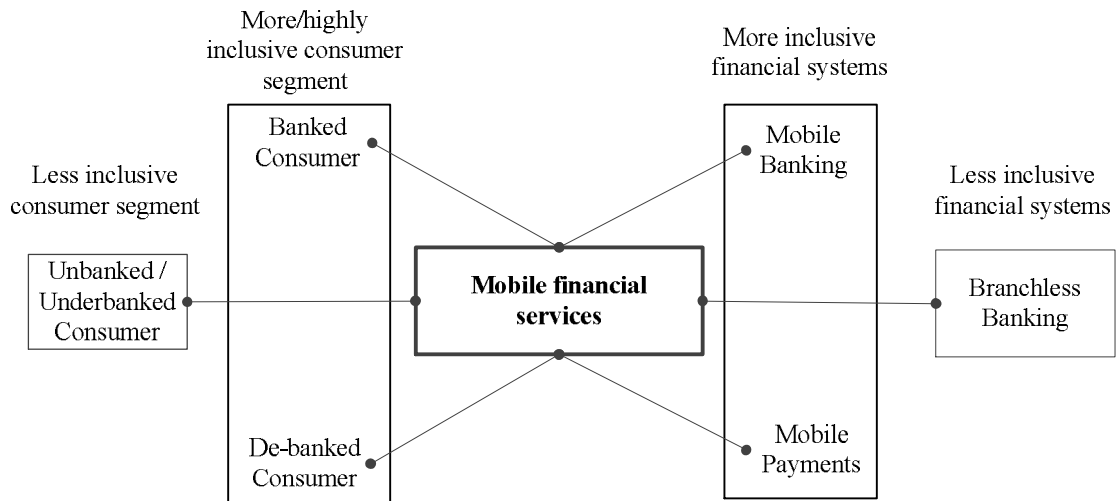


Figure 2: branchless banking landscape

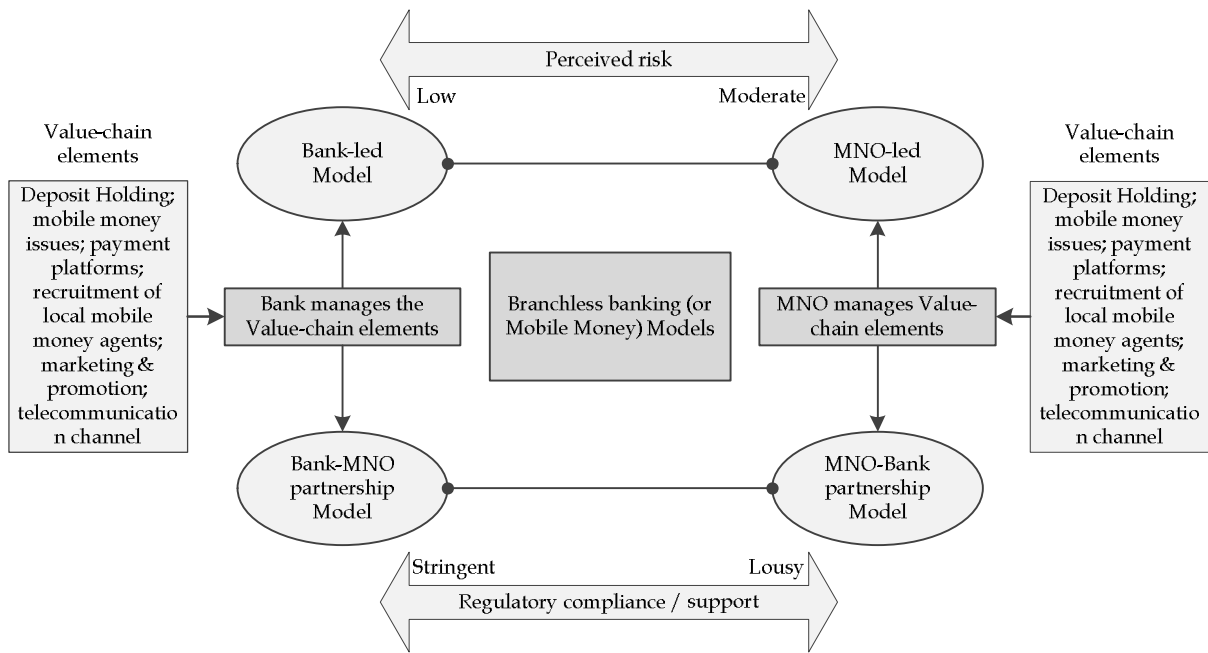


Table 1. Mobile banking literature summary

<b>S.No.</b>	<b>Citation</b>	<b>Definition</b>	<b>Contemplated as</b>
1	Chung and Kwon (2009)	MB is the convergence of mobile technology and financial services, which have emerged after the advent of the wireless Internet and smart-chip-embedded handsets, and it is for people on the move who want to access their bank accounts and transfer funds anytime, anywhere through their phones without visiting banks in person.	...a convergence of mobile technology and financial services.
2	Mehrad and Mohammadi (2016)	MB is an application of mobile commerce that enables customers to bank virtually at any convenient time and place.	...an application of mobile commerce.
3	Tiwari and Buse (2007)	MB is the provision of banking and related financial services such as savings, funds transfer, and stock market transactions among others on mobile devices.	---
4	Chaouali et al. (2017)	MB is an emerging application of mobile commerce that could become an additional revenue source to both banks and telecom service providers. It is a form of service convergence enabled by innovative technologies.	...an emerging application of mobile commerce.
5	Al-Ajam and MdNor (2015)	MB is a cost-effective banking and financial service which allows users to break free of the constraints of time, place, and queues.	...a cost-effective banking and financial service
6	Mohammadi (2015)	MB enables consumers to gain convenient access to value-added and banking services, even in countries with low incomes.	----
7	Boor et al. (2014)	MB is a natural evolution of electronic banking which empowers consumers to complete financial transactions via mobile or handheld devices.	...a natural evolution of electronic banking.

8	Muñoz-Leiva et al. (2017)	MB is considered a remote service (via mobile phone, PDAs, tablets, etc.) offered by financial entities to meet the needs of their customers located in different demographic locations.	...considered as a remote service.
9	Zhou et al. (2010)	MB is defined as the use of mobile devices such as cell phones and personal digital assistants (PDAs) to access banking networks via the wireless application protocol (WAP).	---
10	Veríssimo (2016)	MB is a banking product or service to conduct financial and non-financial transactions using a mobile device such as a mobile phone or tablet	...a banking product or service
11	Malaquias and Hwang (2016)	MB promotes better efficiency and improved service quality, and it also benefits customers through time optimization, immediate information, instant connectivity, great convenience, and interactivity.	---
12	Shaikh and Karjaluoto (2015)	MB, also referred to as cell phone banking, is the use of mobile devices such as personal digital assistants (PDA), mobile telephones, smartphones, and tablet computers to access banking networks via the wireless application protocol (WAP) for financial services.	...a cell phone banking.
13	Tam and Oliveira (2016)	MB is defined as the subset of applications of mobile e-commerce offered by the financial industry. MB enables users to access account balances, pay bills, transfer funds, and perform other financial services, at any time and anywhere.	...a subset of mobile e-commerce application.
14	Lee et al. (2015)	MB is an extension of banking and financial services onto mobile networks and devices. Characteristics such as time and location independence as well as secured transactions through the use of a personal mobile phone to identify the account owner and to confirm the transaction led to rapid growth in mobile banking.	...an extension of banking and financial services.

15	Gu et al. (2009)	With the improvement of mobile technologies and devices, MB has been considered as a salient system because of such attributes of mobile technologies as ubiquity, convenience, and interactivity.	...a salient system.
16	Oliveira et al. (2014)	MB is an instance of a mobile commerce application by which financial institutions enable their customers to carry out banking activities via mobile devices. It relies on technologies (e.g., short messaging services) and communication protocols (e.g., wireless applications protocols, WAP) for providing banking services (e.g., transfer of funds), and related inquiries (e.g., searching for the closest ATM location)	...an instance of a mobile commerce application.
17	Baptista and Oliveira (2015)	MB can be defined as a type of execution of financial services in the course of which, within an electronic procedure, the customer uses mobile communication techniques in conjunction with mobile devices or as a service whereby customers use a mobile phone or mobile device to access banking services and perform financial transactions.	---
18	Masrek et al. (2014)	MB, which is also referred to as cell phone banking is the use of mobile terminals such as cell phones and personal digital assistants (PDAs) to access banking networks via the wireless application protocol (WAP). MB is also considered similar to Internet banking in that it provides a fast and convenient way of performing common banking transactions. MB allows customers to perform three fundamental transactions: (i) storing money in an account that is accessible by the mobile device (ii) completing cash-in and cash-out transactions with the stored account, and (iii) transferring money among different accounts.	...a cell phone banking.

19	Oliveira et al. (2014)	MB includes mobile accounting (e.g., checkbook requests, blocking lost cards, money transfers or insurance policies subscription), mobile brokerage (selling and purchasing financial instruments), and mobile financial information services (balance inquiries, statement requests, credit card information, branches and ATM locations, foreign exchange rates or commodity prices).	---
20	Baptista et al. (2017)	MB can be defined as a type of execution of financial services in the course of which, within an electronic procedure, the customer uses mobile communication techniques in conjunction with mobile devices, or as the ability to bank virtually anytime and anywhere.	---
21	Chawla and Joshi (2017)	MB is defined as a channel whereby the customer interacts with a bank via a mobile device such as a smartphone or a personal digital assistant (Laukkanen and Pasanen, 2008).	...a delivery channel
22	Bhas (2014)	MB is the 'the provision of banking services (operation of bank current and deposit or savings accounts,' encapsulating services such as deposits, withdrawals, account transfers and balance inquiry) to customers on their mobile devices.'	---
23	Gupta et al. (2017); Riivari (2005)	MB, considered as a new marketing and CRM tool, refers to the conduct of banking activities using a mobile device whereby customers can access their accounts to verify balances, transfer funds, pay bills, and perform various other transactions.	...a new marketing and CRM tool.
24	Sharma (2017)	MB refers to a service provided by banks or other financial institutions that allow its customers to conduct a range of financial and non-financial transactions. These	---



		transactions can be realized remotely using a mobile device such as a mobile phone or tablet on dedicated mobile applications (apps), provided by the financial institutions.	
25	Yuan et al. (2016); Dahlberg et al. (2008)	MB means that users adopt mobile terminals such as cell phones to access payment services including account inquiry, transference and bill payment. Compared to traditional/online banking, the main advantages of m-banking are ubiquity and immediacy. That is, m-banking can free users from temporal and spatial limitations, and enable them to conduct payment at any time from anywhere.	---
26	Petrova (2002)	MB can be defined as the ability to conduct bank transactions via a mobile device, or more broadly – to conduct financial transactions via a mobile terminal.	---
27	Barnes and Corbitt (2003)	MB can be defined as a channel whereby the customer interacts with a bank via a mobile device, such as a mobile phone or personal digital assistant (PDA).	...a delivery channel

Table 2. Mobile payment literature summary

S.No.	Citation	Definition	Contemplated as
1	Chen (2008)	MP refers to making payments using mobile devices including wireless handsets (e.g. cell phones and Blackberry devices), Personal Digital Assistants (PDA), Radio Frequency (RF) devices and Near-Field Communication (NFC) based devices.	---
2	Au and Kauffman (2008)	MP is any payment where a mobile device is used to initiate, authorize and confirm an exchange of financial value in return for goods and services.	---
3	Weber and Darbellay (2010)	MP is a range of mobile commerce services that entail initiated or confirmed payment transactions by means of a mobile phone.	... a range of mobile commerce services
4	Gerpott and Kornmeier (2009)	MP is a solution utilizing mobile devices to make transactions, for example, banking transactions or pay bills.	---
5	Liébana-Cabanillas (2012); Liébana-Cabanillas (2014)	MP is a business activity involving an electronic device with a connection to a mobile network enabling the successful completion of an economic transaction.	...a business activity
6	Zhou (2011)	MP means that users adopt mobile terminals to conduct payment at anytime from anywhere.	---
7	Amoroso and Magnier-Watanabe (2012)	MP is defined as any payment in which a mobile device, such as a mobile phone or any other device capable of connecting to mobile communication networks, is utilized to initiate, authorize, and confirm a commercial transaction. A mobile wallet is a type of	---

		electronic wallet which carries out transactions using a mobile device, and the former is an evolution of the latter.	
8	Dahlberg et al. (2008); Tan et al. (2014)	MP is the payment for goods, services, and bills with a mobile device such as mobile phone, smart-phone, or personal digital assistant by taking advantage of wireless and other communication technologies.	---
9	Kim et al. (2010)	MP is defined as any payment in which a mobile device is utilized to initiate, authorize, and confirm a commercial transaction.	---
10	Dennehy and Sammon (2015)	MP is the transfer of funds in return for a good or service, where the mobile phone is involved in both the initiation and confirmation of the payment.	---
11	Liébana-Cabanillas and Lara-Rubio (2017); Ghezzi et al. (2010)	MP is considered by many experts as one of the applications with the greatest potential in this sector, even referring to it as the future “star” or “killer” application in mobile communications. Mobile payment can be defined as any type of individual or business activity involving an electronic device connected to a mobile network thus enabling the successful completion of an economic transaction.	...a “star” or “killer” application.
12	Ting et al. (2016)	MP, which is a particular form of e-payment, utilizes communication technology by enabling mobile users to make payment using Internet-connected mobile devices.	...a particular form of e-payment
13	Ondrus and Pigneur (2005)	MP is the wireless transactions of a monetary value from one party to another using a mobile device whose physical form can vary from a mobile phone to any wireless enabled device (e.g. PDA, laptop, key ring, watch) which are capable of securely processing a financial transaction over a wireless network.	...a wireless transactions of a monetary value

