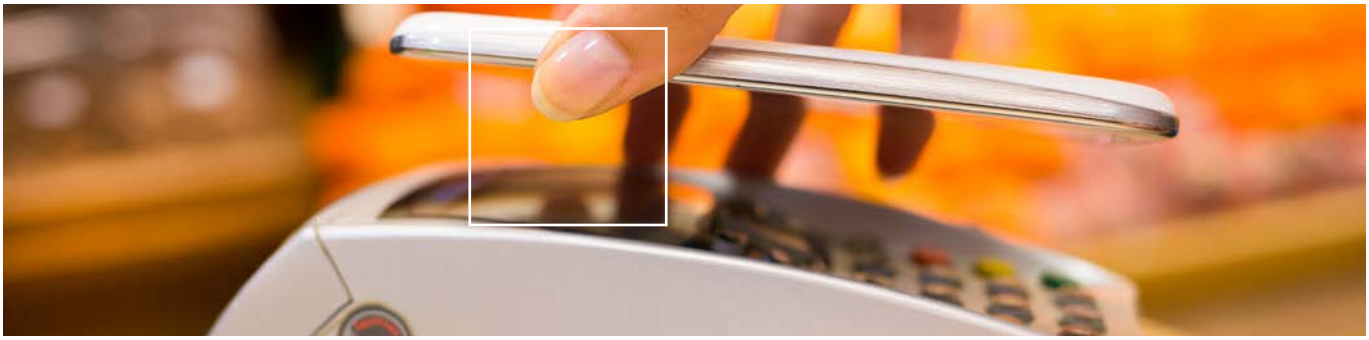
Mobile payment

Is this the turning point?

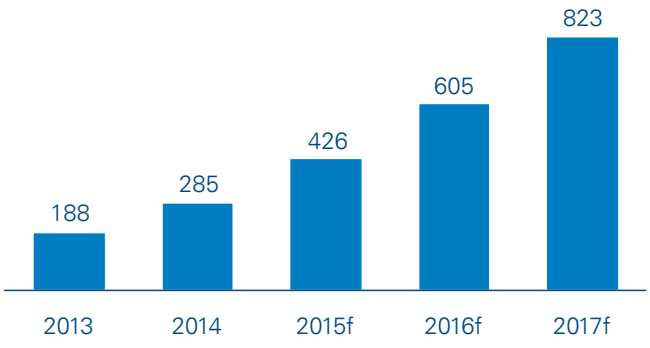


Mobile payment has been on the agenda of numerous players across industries for more than a decade. Now, with Apple Pay and Google Wallet launched and the markets equipping themselves, mobile payment may finally take off. Is this the turning point in developed markets?

Mobile payment has taken off, but not in developed markets – until now

Mobile payment has taken off on a global scale, accounting for a total of 285 billion USD in 2014 and representing 7% of global electronic transactions. Arthur D. Little expects these figures to continue growing at a fast pace, exceeding 800 billion USD by 2017.

Figure 1: Global m-payment value forecast [2013-17, bn USD]



Source: Arthur D. Little (2015)

However, growth rates were mainly driven by emerging markets. By the end of 2014, 259 initiatives were operating in emerging markets and 21 had reached more than 1 million subscribers. Those markets lack widespread banking service networks, and mobile payment addresses the need for easily accessible, secure money transfer and storage.

In developed economies, though, mobile payment is lagging behind expectations. Even markets that transformed into cashless societies early are still in a nascent stage. In Sweden, for example, where cash payments decreased to 22% of total transactions, mobile payments still only represented 3% of transactions as of 2014.

A well-known success story in developed markets is the Starbucks mobile payment app. The app was launched in 2011 and counted 12 million users in 2014, which the firm claimed accounted for about 90% of US mobile payment transactions. Other prominent examples are driven by Korea Telecom in South Korea and NTT DoCoMo in Japan. Nevertheless, success stories in developed markets are mostly regionally bound and specific, such that they have not been replicated or extended on a global scale.

Nonetheless, Arthur D. Little believes a turning point for mobile payment in developed markets is more likely than ever before. Key reasons include the maturity of mobile payment technologies, the level of equipment available to customers and merchants and awareness of mobile payment services.

M-payment technologies are mature, but a standard has not yet been set

The mobile payment ecosystem is complex, with numerous technologies implemented as of today. Those vary, especially in one key aspect – the communication standard used to execute the transaction.

Communication technology

Providers in emerging markets have largely leveraged *SMS / USSD*[1] due to its compatibility with any mobile phone and ease

1 Unstructured Supplementary Service Data is a protocol that enables standard mobile phones to communicate with the service provider's computers

of implementation. The most prominent examples are M-Pesa, originally started in Kenya, and bKash in Bangladesh – both of which now count over 20 million users.

In developed markets, however, no leading technology standard has been set. Depending on their background, key players push different technologies.

The Near Field Communication (NFC) standard, for example, emulates a contactless payment card on the mobile phone and therefore permits card-present transactions. The technology has been on the market for a number of years, is operated broadly in transportation applications (see the Arthur D. Little report *Riding the Mobile Ticketing Wave*), and enables numerous other services such as loyalty programs and couponing. It recently gained particular public attention when it was embedded in Apple's iPhone 6. The main challenge is the cost of upgrading the merchant POS terminals to be NFC ready.

Quick Response (QR) code is a technology compatible with all smartphones, as the user only needs to scan a code generated by the merchant, e.g. on a tablet screen. Today the technology is particularly known in the US for its application in the Starbucks mobile payment solution. The upcoming initiative CurrentC, by Merchant Customer Exchange (MCX), which gathers major retailers in the US, relies on QR codes provided by Paydiant, which was recently acquired by PayPal.

Besides NFC and QR code-based solutions, *mobile internet payment* solutions have been popular in recent years, despite necessitating a continuous broadband connection to enable the service. Prominent examples of providers using this technology are Alipay and Tenpay, which represented over 85% of mobile transactions in China by the end of 2014. Using mobile internet, they provide a customer journey that is similar to an online purchasing experience.

In the wide range of mobile payment solutions offered, further promising technologies exist. However, these display a considerably lower level of maturity compared to the solutions mentioned above. *Bluetooth Low Energy (BLE)*, which shows considerable potential for context-based value-added services, is such a technology. A further technology is *Magnetic Secure Transmission (MST)* offered by LoopPay. The company, recently acquired by Samsung, provides an MST service that mimics a magnetic card swipe and can therefore make use of existing magnetic card terminals. This could have a significant impact on mobile payment adoption in countries where the EMV standard is not fully deployed, such as the US. Another promising technology, Soundwave, makes use of white noise generated by a smartphone to carry payment information. However, the service is currently offered by a limited number of providers such as the leading Asian player Alipay, which launched the service in 2015. Figure 2 below gives a breakdown of the communication technologies

Figure 2: Overview of most common mobile payment technologies

Technology	Service introduction	# of initiatives globally	Enabled phones	Maturity
SMS / USSD[1]	1984	>500	Feature phones	High
Mobile Internet	1990s	>500	Smart-phones	High
QR / Bar Code	1994	50-100	Smart-phones	Medium-high
NFC	1997	100-500	NFC Smart-phones	High
BLE	2006	10-50	Feature phones	Low-medium
Soundwave	2013	10-50	Feature phones	Low
MST	2014	10-50	Add.device required	Low

Source: Arthur D. Little (2015)

Security enablers – beware the weakest element

A first security enabler involves payment credential storage, in which mobile payment players have pushed different types of secure elements (SEs) depending on the assets they aim to leverage.

- MNOs have long pushed to establish the SIM card-embedded SE as a standard.
- Handset manufacturers have more recently introduced handset-embedded SEs (eSEs), which they can directly provision.
- Over-the-top (OTT) players such as Google have championed cloud-based solutions, in which the SE is accessed via the data connection.

More recently, providers have started to introduce tokenization layers to enhance payment risk protection. Tokenization replaces the payment credential with a limited-use, non-sensitive substitute (token). This ensures that the payment credential does not need to be replaced in case of fraud.

Additionally, significant progress has been made on authentication technologies. By 2014, 300 million devices had biometric sensors implemented, which further improved the security of executing a mobile payment transaction. Fingerprint recognition is the most popular technology in this area, and the most integrated by handset manufacturers. Another means that has gained significant attention in this field is facial recognition, which was recently demonstrated by Alibaba.

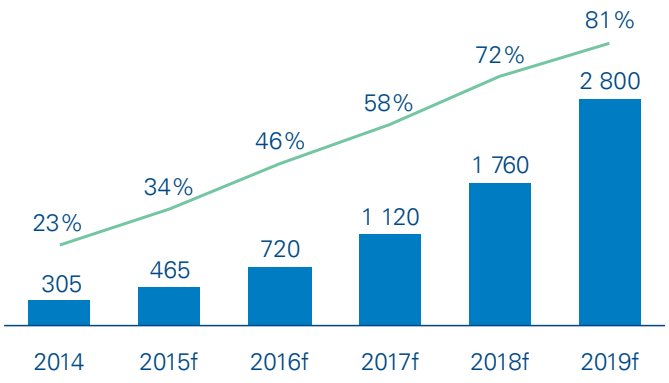
Apple Pay

The recent launch of Apple Pay has brought the mobile payment topic back into the spotlight. This is also due to the fact that Apple Pay has combined and leveraged multiple success factors, which few operators have managed to do. With the combination of eSE for credential storage, tokenization and fingerprint authentication, as well as the use of NFC, Apple enables both a high level of security and a smooth customer journey. In addition, in the introduction of its payment service, Apple benefits from a strong trust relationship across its customer base and has managed to onboard major banks. The only lever that Apple cannot immediately activate is the development of the merchant acceptance network.

The market is mobilizing

Users have become equipped. Among the different technologies identified, NFC requires specific end-user equipment. As a matter of fact, all leading mobile phone manufacturers (namely Samsung, Apple, Huawei and Xiaomi) market NFC-enabled smartphones. Market forecasts anticipate an 81% NFC penetration in the worldwide handset base by 2019.

Figure 3: Worldwide NFC enabled smartphone shipments in millions and penetration in %

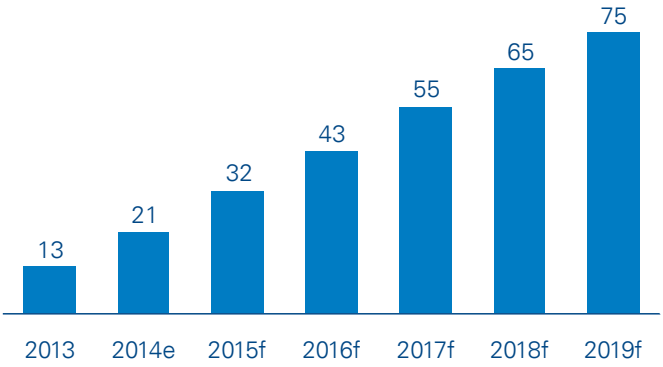


Source: Technavio (2014)

In addition, users have shown increased willingness to use mobile payments for their daily purchases. In Europe, 185m users will utilize a mobile payment app this year, up 51% on 2014, according to a study by ING.

Lastly, the merchant network is developing. With large retailers planning to push mobile payments in their stores in the US and numerous initiatives active in the mobile payment space worldwide, the network of acceptance points for the yet heterogeneous mobile payment technologies is increasing steadily. The growing presence of mobile payment technologies is also reflected in the growing network of NFC acceptance points pushed by terminal manufacturers such as Ingenico. In 2014, there were 21 million NFC-enabled POS terminals in operation across the world. With the required POS terminal upgrades ongoing and several European markets having engaged in this upgrade, as well as the ongoing transition to the EMV standard in the US, this trend is accelerating. By 2019 worldwide acceptance will increase to 75 million – which would more than double the number of Visa card acceptance points in 2014.

Figure 4: Worldwide NFC enabled POS terminals



Source: Berg insight (2015)

The course is set – what impact does this have on the players in the market?

We believe mobile payment is at a turning point, with customers embracing digital behavior, technological solutions providing the right level of convenience of use and security, and a steadily increasing acceptance network. Hence, we must explore how this will impact the different players in the market.

Mobile network operators

Mobile network operators (MNOs) have been active in this space for over a decade, but with limited success of their third-party partnership models. They are now facing an ever-decreasing window of opportunity as other players seek to bypass them. MNOs, nevertheless, still possess key assets in mobile payment, namely the secure element on the SIM and their customer relationships. They are now challenged to find ways of leveraging those assets, e.g. by establishing a nationwide hub trusted service manager (TSM) that could be used by financial institutions or other third parties.

Banks and payment networks

While payment networks have maintained their place at the forefront of innovation, banks have shown more reluctance to fully engage with mobile payment. Nevertheless, they have managed to demonstrate that they still play a central role in the ecosystem. This role has been confirmed in the latest OEM[2]- and OTT[3]-driven service scenarios. However, more recent models and, more specifically, merchant-driven initiatives (e.g.

2 Original Equipment Manufacturer refers to handset manufacturers
3 Over The Top refers to Internet players

Starbucks, MCX) show alternative approaches in which the acquisition network does not need to rely on banks. Hence, building on their historically strong position, banks are being challenged to engage more strongly in innovation to maintain their role in the future of the ecosystem.

Merchants

Limited merchant adoption is often mentioned as the main reason for the failure of mobile payment initiatives. Recent examples of partners blocking the roll-out of Apple Pay in the US show that merchants have a strong influence on the ecosystem takeoff. In addition to being one of the key enablers of a solution, merchants also need to manage the stretch between leveraging the customer relationship with, for example, enhanced loyalty and couponing services or detailed customer analytics while managing customers' skepticism towards boundary-less use of analytics.

Handset manufacturers

Handset manufacturers have been late entrants to the mobile payment market, but could still become relevant and game-changing players. They have benefited from the limited success of using the secure element on the SIM by integrating it into a secure element in the handset to store the payment token. The key challenge we see for those players is to achieve a critical mass and ensure sufficient customer stickiness so as to establish partnerships with banks.

OTT/software providers

Mobile payment has become an increasingly attractive playing field for OTTs, which often benefit from strong customer relationships and already have billing information. Their solutions are mostly device agnostic and therefore have the potential to reach the whole population. Google's acquisition of Softcard shows the continuous willingness of the company to establish its footprint within payments and might represent the first step of an enhanced partnership with MNOs.

Conclusion

Despite significant developments, especially in developed markets, no clear model or winner has been established yet. Hence, all players are still in a position to participate, as we believe the market will structure around global as well as local initiatives.

Among global players, Apple is well positioned and expanding its mobile payment service to Europe as of July 2015. Google is also accelerating to grasp its shares in the market by integrating its service in the main US MNOs' smartphones, thanks to its acquisition of Softcard. At the same time, the hardware manufacturer Samsung is positioning to release a payment product for its mobile phones.

On a more local scale, MNOs are highly relevant to playing a key role in both B2C and B2B developments thanks to their local footprint and market understanding.

Nonetheless, the window of opportunity is closing. There is an urgent call for all players to position and go to market with convincing strategies for success in the mobile payment space.

Arthur D. Little's global team of telecom management consultants has supported numerous mobile network operators, financial institutions and related players developing and implementing their mobile payment strategies.

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Arthur D. Little

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