

Mobile Payments 2016

A recent market analysis, impacts and
recommendations for the banking sector

GFT Whitepaper

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1 Executive Summary

Mobile transactions are gaining ground throughout the world.

There are a variety of market players in Germany and most of the other European countries, and some of these companies focus on disruption.

Almost one in every two Germans could imagine totally doing without cash when shopping.

On 5 May 2016, the European Central Bank decided to stop issuing the 500 euro banknote. Experts, such as the head of Deutsche Bank John Cryan, believe this is just the beginning of a new development which could culminate in completely doing away with cash. Indeed, as digital technology invades more and more areas of cash use and the flow of goods, the question arises as to whether tactile currency will even be needed in the future. Contactless payment systems are quickly gaining ground throughout the world.

Even in Germany, where people have traditionally been attached to cash, a [recent survey by the IT association Bitkom](#) found that nearly one in two people (46 per cent) could imagine doing away with banknotes and coins in the future. A year ago, this figure was only one-third (36 per cent).

On an international level, the trend towards mobile wallet solutions has been underway for some time. Such solutions combine different services utilising near-field-communications (NFC) compatible smartphones – from remote applications and proximity payment solutions, to couponing systems, ticketing functions, identity checks and access controls. It will still be some time before it becomes clear which providers will emerge as the winners. PayPal may already be dictating the pace in the United States and a selection of European countries, but the global market remains in a state of flux.

Mobile wallets that deliver genuine added value for the customer are much more likely to succeed.

In future, payment transactions will no longer be a standalone process or function, instead they will be a component of an overall value chain, which is growing in length and becoming increasingly complex. For the banking industry, the mobile payment market presents a variety of possible new business models.

In a recent survey*, three out of every four consumers said they would be more likely to trust an app provided by their High Street bank when making payments with a smartphone. Only around one in ten would trust an IT company such as Apple or Google.

The introduction of instant payment services will add further momentum to the market. By 2018 it should be possible to make payments in the eurozone in real time – both between companies and private individuals (P2P). This paper sheds light on the mobile payment services that are currently on offer, scanning the market in eight key countries. It also examines opportunities and challenges for the financial services industry. One revealing that is gained is from a comparison with the GFT paper issued in 2012. This reveals the extent to which the mobile payment market has now evolved. In which areas is urgent action required in the banking industry? This GFT analysis provides clear answers.

Source: ING-DiBa

2 Introduction

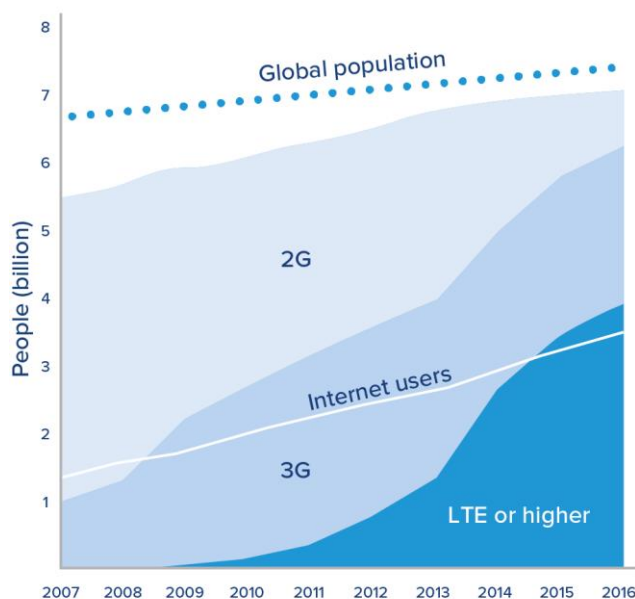
Around 50 per cent of the world's population have rapid internet access through a mobile device.

2.1 Global supply of mobile internet access

According to the International Telecommunication Union (ITU), roughly seven billion people (or 95 per cent of the global population) live in an area with access to a mobile telephone network and 84 per cent of people have access to a data broadband mobile network. LTE networks – or fourth generation mobiles (4G), which deliver very fast mobile access to the internet – have expanded rapidly over the last three years and are now accessible to just under four billion people (53 per cent of the global population).

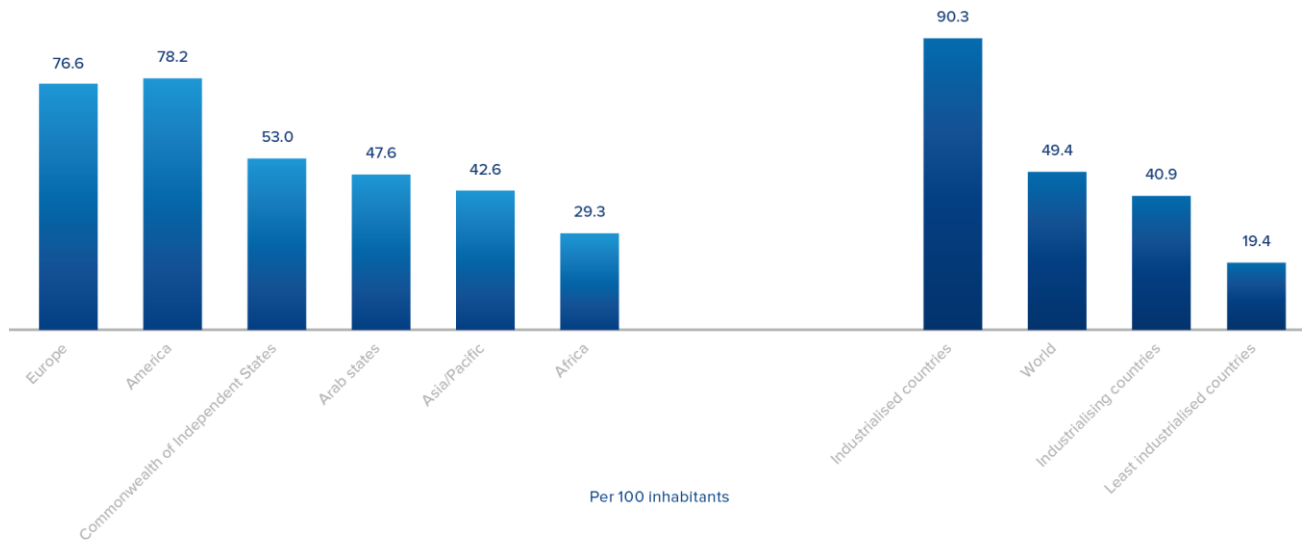
Most people who use their smartphone to go online through mobile broadband networks live in North or South America (78.2 of every 100 inhabitants), closely followed by Europe (76.6). A long way behind these regions are the Commonwealth of Independent States (CIS), which include Russia, Ukraine, etc (53.0), the Arab states (47.6), the Asia / Pacific region (42.6) and Africa (29.3). The ITU estimates that around 3.6 billion people worldwide will have broadband internet access by the end of 2016.

Mobile internet: 4G is expanding



Source: www.itu.int

Use of mobile broadband networks



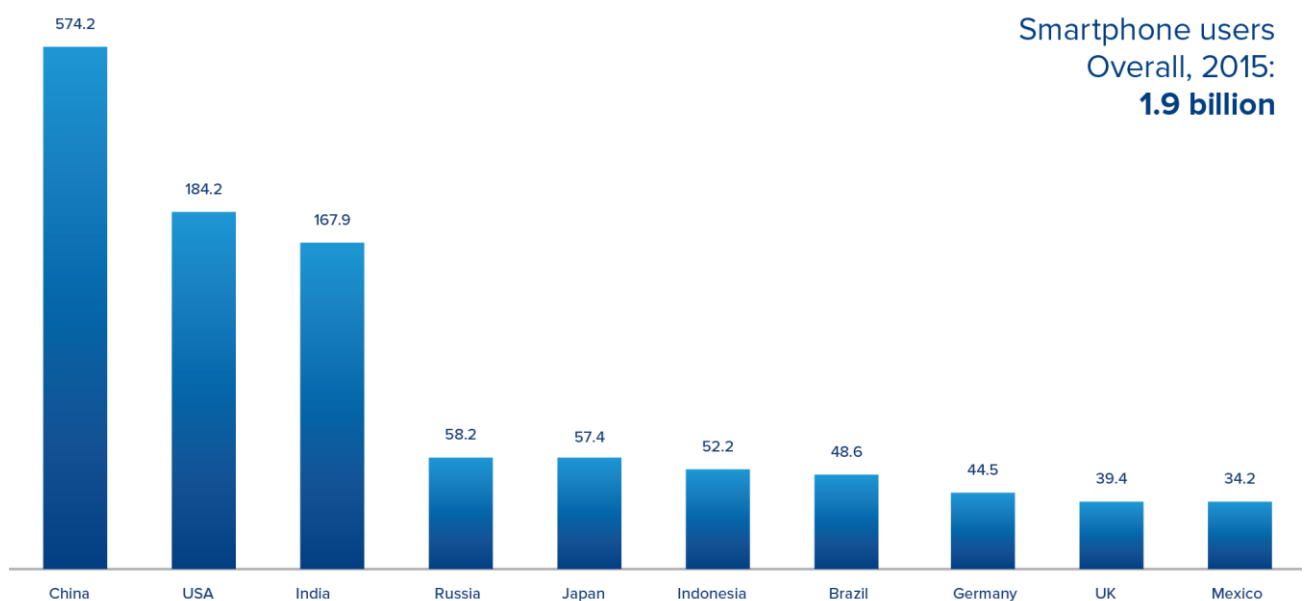
Source: [ITU Telecom](#)

2.1.1 Smartphone use in key markets

With around 574 million users, China leads by a long way in the booming smartphone market, followed by the United States and India. These countries are followed by Russia, Japan and Indonesia. Germany has 44.5 million smartphone users and is 8th in the international rankings.

Top 10 smartphone countries

Estimated number of users in 2015 (millions)



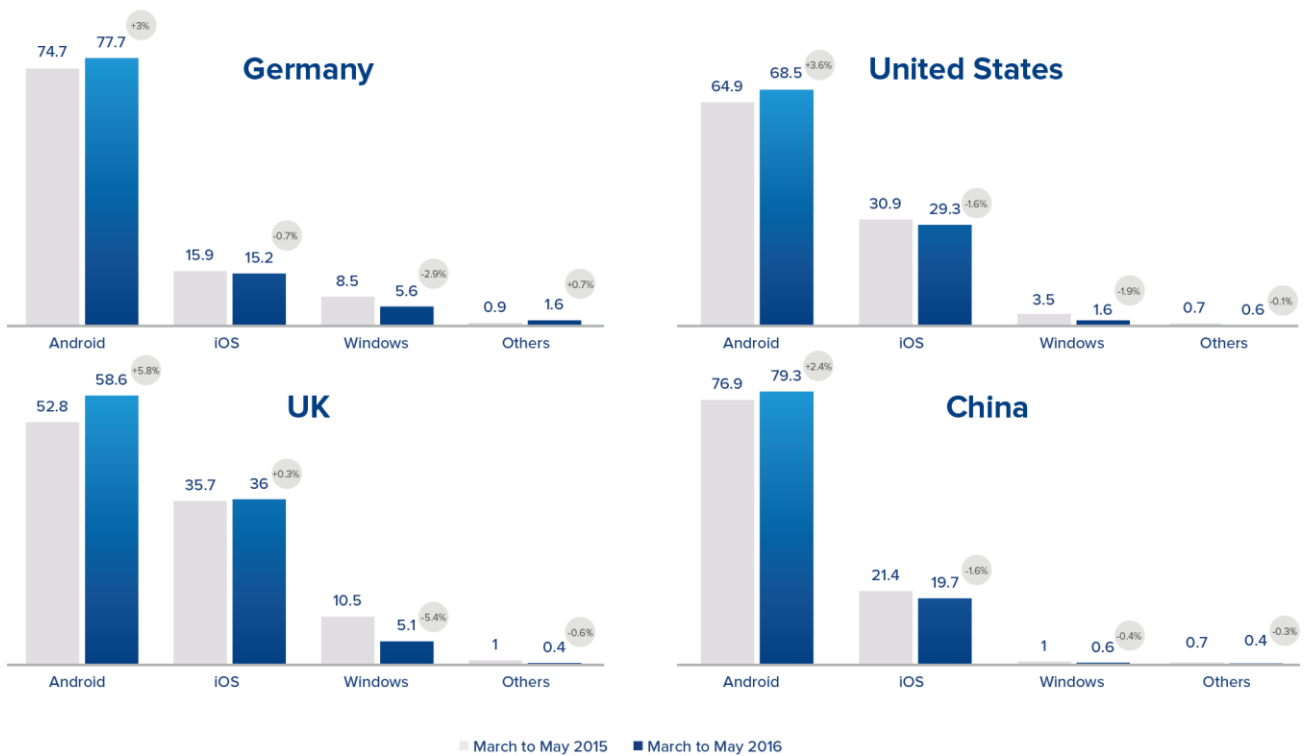
Source: [Statista/eMarketer](#)

2.1.2 Market share of mobile operating systems

The triumphant march of Google operating systems on smartphones continues: according to a [study conducted by the market research agency Kantar Worldpanel ComTech](#), between March and May 2016 the market share of Android systems in the five leading markets in Europe (Germany, France, UK, Italy and Spain) rose by 6% versus the previous year (to 76.5%). The Android share in Germany rose by 3% (to 77.7%) and by as much as 10.2% in Italy (to 80.9%). The researchers found a rise of 3.6% in the United States (to 68.5%) and in China, growth was 2.4% (to 79.3%). The high-profile prime competitor Apple is a long way behind Android in all countries with the exception of the UK, where Apple has 36% share of the market, versus Android with 58.6%. Windows Mobile does not play a significant role at an international level and is continuing to lose ground.

Smartphone turnover by operating system

From March to May 2015 vs. 2016



Source: Kantar Worldpanel ComTech 2016

2.2 Mobile payment developments

The Asia / Pacific region and Africa have the most widespread access to mobile payment services. Europe still has some catching up to do.

The first European mobile payment system that was suitable for mass market use was developed in Germany. In the early months of 2000, a new company from Frankfurt called Paybox launched a highly promising mobile commerce system. Although it was still early days, users of the system were already in a position to transfer money to other mobile users and to make payments through the internet. However, three years later, the company stopped marketing the system due to a lack of significant growth.

It was not until the smartphone boom got underway, hand-in-hand with a rise in mobile internet services, that mobile payment systems received a major boost over the last two years. Mobile payment systems are now well received, especially in the Asia / Pacific region and in African countries, where few inhabitants have a conventional bank account. In Europe, it is the UK and southern European countries such as Spain and Italy that are the key drivers of mobile payment systems, whereas in Germany, optimisation are still required in the retail industry and consumers continue to remain sceptical of mobile payments.

Who are the wallet providers and where do they operate?

Mobile wallet solutions

Company	Wallet	US	GE	CH	FR	UK	ES	PL	IT	SWE	CHN	BR	JP	KOR
PayPal	PayPal	✓												
Google	AndroidPay	✓				✓								
Vodafone	Smartpass		✓			✓	✓		✓					
Telekom	MyWallet		✓					✓						
Telefonica	Country		✓											
Alibaba	Allpay		✓								✓		✓	✓
Tencent (QQ)	Webpay										✓		✓	✓
Apple	ApplePay	✓	Est.'17	✓	✓	✓					✓			
Samsung	SamsungPay	✓				Est.'16	✓				✓			✓
NTT DoCoMo	Osafu-Keltai												✓	
SK Telecom	T Smart Pay													✓
Seamless	SEQR	✓	✓		✓	✓	✓		✓	✓				
Orange	Orange Cash				✓		✓	✓						

Key providers at a glance: Germany is not the only country with several small providers. The US internet companies have a strong position in the countries where they operate.

2.3 GFT market studies in 2012 and 2016

GFT began tracking mobile payment trends in 2012, presenting a market analysis with predictions and recommendations for the banking industry. What has happened to the market in the four years since?

Which of the GFT predictions came true? Which recommendations were implemented? Which major market players are setting the pace? GFT examined all of these aspects for this new paper and is now in a position to provide a comprehensive overview of the market in eight key countries: Germany, Switzerland, Spain, Italy, the UK, the United States, Brazil and China.

GFT predicted that mobile wallet solutions would enter the market within the next twelve months. This did in fact happen, but the success did not last due to a lack of customer acceptance. The reason things seem to have gone wrong is that either the concepts were not sustainable, or there was insufficient support at the PoS, or the on-boarding processes were too complicated – in fact it was a combination of all three of these factors.

Then in 2016, there was a different, fast-moving development and this shift changed the entire scenario: key players from outside the industry entered the scene, firms such as the major smartphone manufacturers (Apple, LG, Samsung) and internet giants with billions of customers and deep pockets (Facebook / WhatsApp, Google / Android). In many countries a viable NFC technical infrastructure is now in place – a key prerequisite for the wide-scale use of mobile payment solutions. There are currently over 3.2 million contactless terminals installed in shops and restaurants across Europe.

The market research agency Gartner predicts that one in every two consumers in developed markets will already be using smartphones or wearables in order to make mobile payments by 2018.

Instant payment services will add impetus to the market. Under plans tabled by the Euro Retail Payments Board (ERPB), a rulebook for realtime payments should be introduced into the eurozone during 2018.

2.4 Mobile wallets and potential usage scenarios

2.4.1 Closed systems

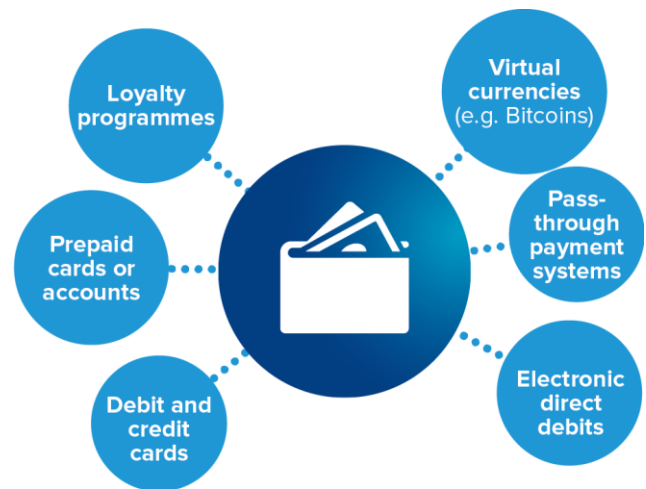
A typical feature of this kind of closed system wallet solution is that they are offered by an individual retail chain and only offer that chain's payment services, with a variety of additional support options – for example in the form of an app. From the consumer's perspective, this means they are highly limited in terms of everyday usefulness because a smartphone app is required for each provider. Companies with such closed systems also have to make a major investment in technical development and application maintenance. In Germany, it is primarily the food retailers that are focussing on closed systems (e.g. the Edeka Group).

2.4.2 Open systems

Mobile wallets based on open platforms make it possible to merge different systems hosted on a smartphone, either for authentication purposes or to offer services in alternative digital formats. This not only includes mobile payment functions, but also digital proof of identity (personal ID cards, driver's licences, medical insurance cards) and access authorisation, such as digital keys. Added-value services that fuel customer loyalty can also be integrated, with options such as virtual cash. This creates an entire ecosystem around the mobile wallet itself based on new value chains, thus providing a variety of entry points for companies in different sectors of industry.

The mobile wallet business platform

Integration of different functions



3 Definitions and terms

Mobile banking transactions make use of a variety of key technologies. This section of the white paper provides an explanation for a number of the specialist terms they involve.

3.1 Technology

3.1.1 Biometric authentication

Biometric systems make contactless payment methods more secure and more user-friendly for customers.

More and more passwords and PINs are being replaced by biometric alternatives. When the Apple iPhone 5S was introduced in 2013, it was equipped with a fingerprint scanner and this ensured that a wider audience was introduced to this innovative security feature. Apple calls its scanner Touch ID and the system can primarily be used to unlock devices without having to swipe the screen or enter a PIN. Most premium smartphones now incorporate a fingerprint sensor, including Samsung's Galaxy range (Galaxy S5 onwards) and Sony's Xperia range (Xperia Z5 onwards). The IT world has also recently started shifting toward other biometric areas such as iris and face scanning, using the onboard camera within devices (e.g. Microsoft, Samsung).

3.1.2 Bluetooth low energy (BLE)

Bluetooth low energy is an energy-saving alternative to conventional Bluetooth wireless technology and is primarily used for wireless smartphone connections to headsets, wearables and printers. It allows smartphones located near a BLE transmitter to be identified automatically so they can also be used to make payments. This means that mobile devices do not need to be held right next to the checkout. BLE technology can also be used to send messages to smartphone users up to 30 metres, in order to advise them of localised offers and promotional discounts.

3.1.3 Host card emulation (HCE)

Host card emulation (HCE) enables secure smartphone payments based on near field communication (NFC), without the need for any physical technology within the mobile device. All data generated during a transaction is shared via the cloud. A one-off token is created for each individual transaction for encryption purposes. This token acts as a replacement for the original card information, which is stored away safely on a secure server. There is no need to amend authorisation processes used by the bank or make changes to PoS terminals used by retailers.

3.1.4 Near field communication (NFC)

This short distance wireless transmission technology has already become well established in a large number of countries. It is also used for paperless ticketing at major events or for managing access to high-security areas. To pay for an item, all users have to do is hold their smartphone briefly next to an NFC checkout device. This saves a significant amount of time compared to cash or card payments. Because the distance between the smartphone and the NFC reading device has to be 10cm or less, this technology prevents fraudulent third-party access and offers the best possible data security.

3.1.5 Quick response (QR) code

QR codes are one or two-dimensional barcodes consisting of a matrix of black and white dots that represent a code in binary. They are often seen on posters or in magazines to provide a link to partner brand. By scanning a QR code with a smartphone app, users can follow a hyperlink to find out more information about a product or event. When used for transaction purposes, they contain key payment and invoice information, but actual payments do not take place until data has been transferred successfully using a debit or credit card. In the longer term, QR codes are basically considered to be a transitional technology.

3.1.6 Secure elements (SE)

To protect smartphone functions which are considered security-critical, such as transferring banking information during a contactless payment, some SIM cards contain a secure element. This is issued by the mobile network operator. A number of mobile devices are already available with an embedded secure element chip (e.g. Samsung).

3.2 The financial market

3.2.1 In-app payment

Some retail chains in Germany also allow cashless payments via an app without NFC technology. This is especially the case in the grocery trade. For example, the supermarket chain Edeka provides an app that creates a barcode on Android or iOS smartphones after users have entered their PIN. This barcode can then be scanned like any other product barcode at the checkout. The grocery bill is paid via direct debit from the smartphone user's bank account. Coupons stored in the app are also taken into account automatically.

3.2.2 Instant payment

This entails real-time cash transfers from one smartphone to another, and as such it is considered a key driver of mobile payment systems in Europe. As a rule, payment recipients have instant access to any transferred credit as soon as it has been approved. An EU standard should be in place for instant payments by 2018.

3.2.3 Mobile payment (m-payment)

Mobile payments (also called mobile money transfer or mobile money) are any kind of cashless and contactless payments made with a mobile end device. The purchaser of an item simply uses their smartphone, tablet or wearable as a type of electronic wallet. M-payments span a variety of applications and technology options in the fields of e-commerce and bricks-and-mortar retailing, as well as person-to-person (P2P) payments.

3.2.4 Mobile wallet (m-wallet)

Holding a virtual wallet on a smartphone makes it possible to make electronic payments through a credit card or bank account. Such systems can also be linked to couponing applications, loyalty schemes and ticketing solutions. Smartphone payments are thus just one of many possible options.

3.2.5 Mobile proximity payment

This is where a payment made with a mobile device takes place through a stationary PoS device, with a distinction made between **user-initiated payments** (in which customers proactively use their smartphones and then a transaction is carried out using NFC or a QR code), and **automatically initiated payments** (when a payment takes place without proactively using a smartphone, e.g. via Bluetooth).

3.2.6 Mobile remote payment

This refers to smartphone payments through the internet. A distinction is made between **bank-based solutions** (settlement by credit card / through the bank) **and carrier-based solutions** (settlement through the mobile network operator). A mobile wallet typically offers a combination of proximity and remote payment solutions.

3.2.7 Person-to-person payment (P2P)

A term describing cash transfers from one private individual to another via smartphone, for example between friends.

3.2.8 Payment service provider (PSP)

A PSP is a company that operates the technical infrastructure required to carry out mobile payments. Its role is to operate the interface between banks, credit card companies and other firms. Many payment service providers also offer other services such as risk management, factoring and debt collection.

3.3 Overview of providers, technologies and different types of companies

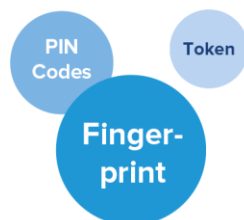
A number of companies and technology formats are currently competing for customers; these are being introduced by banks, mobile network operators, FinTech firms and payment service providers.

Overview

Providers



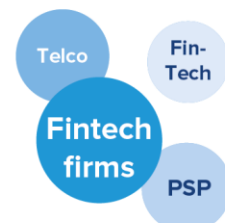
Verification



Technology



Type of company



3.3.1 Payment types: function

Twenty years ago, payments were predominantly made in cash, via bank transfer or with a cheque provided by the bank. These days, more and more use is being made of electronic and digital payment methods.

- Cash
- Debit and credit cards
- Bank accounts for electronic direct debits
- Prepaid cards or prepaid accounts
- Pass-through payment services
- Loyalty programmes
- Virtual currencies (e.g. Bitcoin)

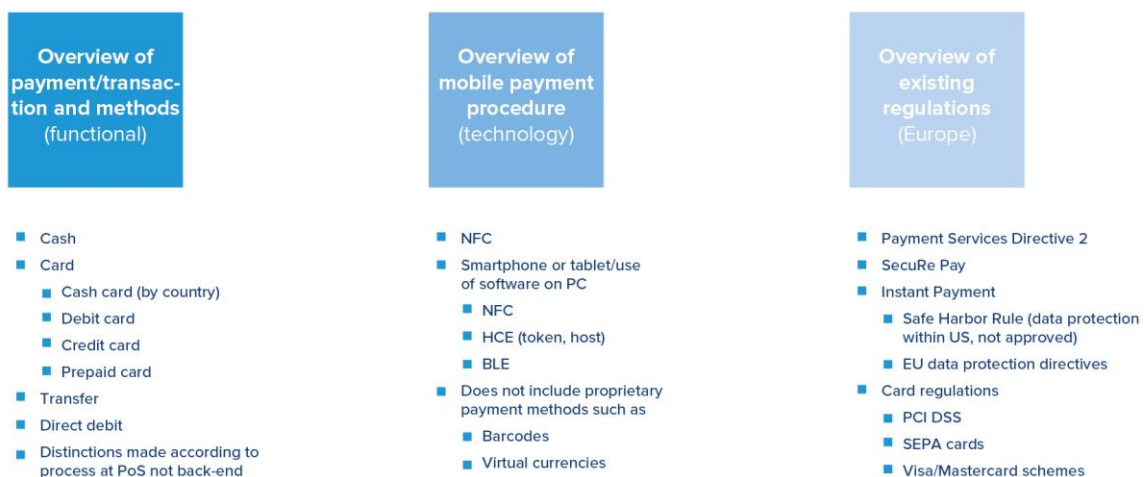
3.3.2 Payment types: systems

The technologies that match the preferences of mobile payment providers most closely are near field communication, host card emulation and wallet apps.

- Card with NFC chip (contactless)
- Smartphone or tablet (software-based, app or HTML): NFC, host card
- Emulation (HCE; token, host), Bluetooth low energy (BLE)

Overview

Comparison of different payment options



3.4 Overview of relevant EU guidelines

3.4.1 Payment Services Directive 2 (PSD2)

The banking sector will have to implement a whole host of EU guidelines in the near future. These are aimed at improving security and competition within the market for mobile payment solutions.

The PSD defines payment services (bank transfers, direct debits, card payments, etc) and outlines the regulatory framework for the providers of payment services. It was overhauled in late 2015 and passed by the EU parliament under the name PSD2. These new guidelines provide more protection to consumers when making payments, encourage companies to develop innovative payment services and strengthen the security of transaction services.

The new rulebook for PSD2 entails important changes:

- The introduction of security requirements for processing electronic payments and the protection of all customers' banking data.
- The opening up of the EU banking transaction market to firms providing consumer or corporate payment services based on information accessed via payee account details. Such providers will have to be clearly authenticated by the consumer's bank and must ensure that aspects relating to personal security are not accessible to any other parties. The responsibility for monitoring such activities lies with the German Federal Financial Supervisory Authority BaFin.
- Stronger consumer rights, such as less liability for unauthorised transactions and the introduction of an unconditional right of reimbursement for debits issued in euros.

3.4.2 Security of retail payments (SecuRe Pay)

In 2014, the governing council of the European Central Bank ratified guidelines for evaluating the security of payments made through the internet. These regulations, which were drafted by the European Forum on the Security of Retail Payments (SecuRe Pay), are aimed at the providers of transaction services and payment systems. They are not only applicable to card systems and the banks that issue cards, but also to all service providers that process card payments relating to e-commerce.

3.4.3 The EU / US Privacy Shield (data protection agreement)

In February 2016, the EU commission and the United States authorities agreed a new legislation framework for the transatlantic sharing of data for commercial purposes. The aim was to protect the fundamental rights of private individuals when data is transferred to the USA. A 'privacy shield' had become necessary the previous year after the European Court of Justice declared the previously applicable 'safe harbour rule' to be invalid.

3.4.4 Credit card regulations (PCI-DSS)

Data security standards in the credit card industry are designed to protect end-user customers and dealers from fraudulent activity and security loopholes. These standards include technical specifications and recommendations for handling sensitive customer data within companies.

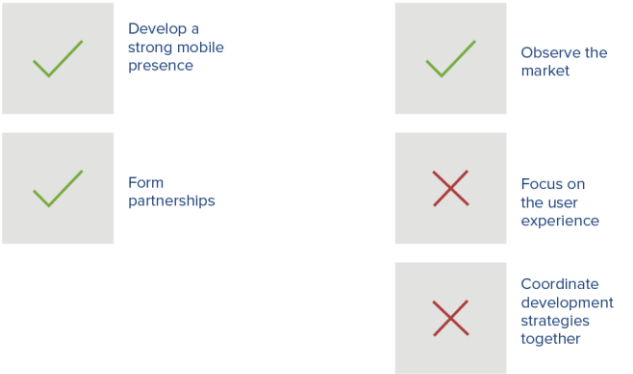
3.5 Review: the GFT Mobile Payment Blue Paper in 2012

In 2012, the Mobile Payment Blue Paper provided a detailed introduction to the mobile payment market, outlining the new mobile ecosystem at the time, introducing the key players and examining the impact the market would have on financial institutions. The report contained a series of recommendations on how the banking industry should react to new competitors in order to continue to lead the market from the front.

As the following figure shows, recommendations were implemented by the banks in some areas, although even here the situation is far from ideal. There is an urgent need to catch up in two areas, first of all in terms of the user experience and secondly when it comes to translating payment concepts still under development into appealing products which are compatible with mass market requirements.

Which GFT recommendations were implemented and which ones were not?

GFT recommendations (2012) and current status (2016)



4 The mobile payment market in Europe

In 2012, GFT predicted that markets were on the cusp of an introduction to mobile wallet solutions. These new solutions did indeed enter the market but their success was short-lived as they failed to gain customer acceptance. There were many reasons for the solutions backfiring. Either they failed to deliver added value with insufficient availability of checkout terminals in the retail trade, or the on-boarding process was too complicated – or it a combination of both factors.

PayPal, Google and Apple are likely to be joined in the European mobile payment solutions market by Facebook and Alipay from China.

New market players are now entering the market. These include the major smartphone providers (Samsung, Apple, LG) and internet companies with a broad base of customers. As in 2012, a large number of companies come from the United States, but in all likelihood these will soon be followed into the market by providers from China or Scandinavian countries. The internet giants such as Google and Facebook will also extend their message services to include mobile payment functionalities. As part of the Facebook empire, WhatsApp has more than a billion worldwide users alone.

The technical infrastructure for mobile payments will improve in the near future in Germany. All PoS terminals must be upgraded to allow for contactless card payments by 2020. The larger retail and restaurant chains such as Kaufhof, Edeka and Starbucks are already using NFC-compatible checkout systems.

Even though the research conducted by GFT concentrated on international wallet solutions, the highly successful regional players such as swish (Sweden), Paymit (Switzerland) and paym (UK) should be noted.

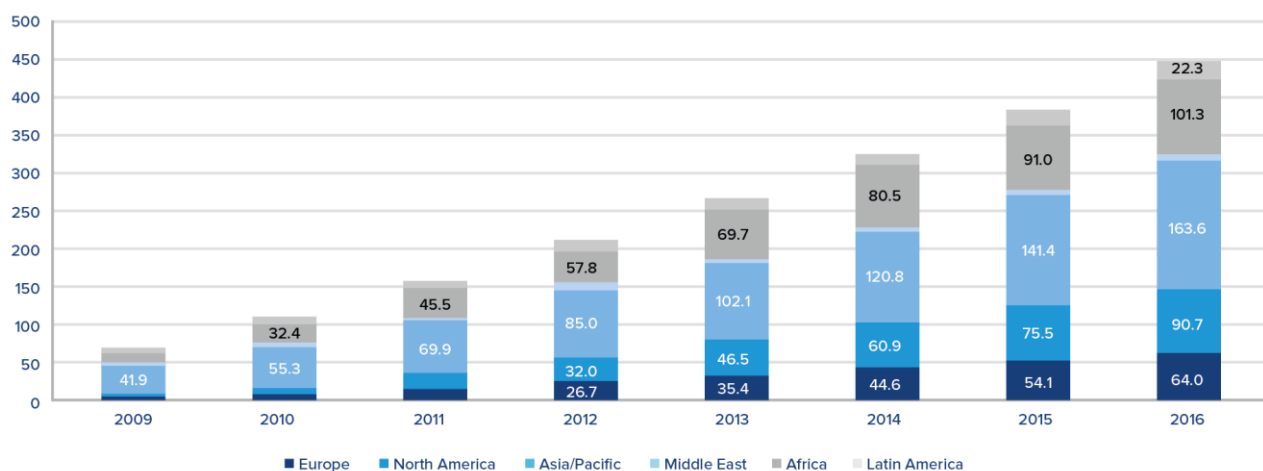
4.1 Market developments between 2009 and 2016: mobile payments worldwide

The triumphant march of mobile payment solutions started in the Asia / Pacific region, which had 85 million users as early as 2012, followed by Africa (57.8 million users, on a continent where conventional bank accounts are not common), North America (32.8 million) and Europe (26.7 million). The Asia / Pacific region still leads the field by a long way in 2016 with 163.6 million users, followed by Africa (101.3 million) and North America, where there has been significant growth in recent years (90.7 million). In Europe there are currently 64 million users.

Number of mobile payment users

Growth by region 2009-2016 (millions)

Surprises from the African continent



Source: Statista

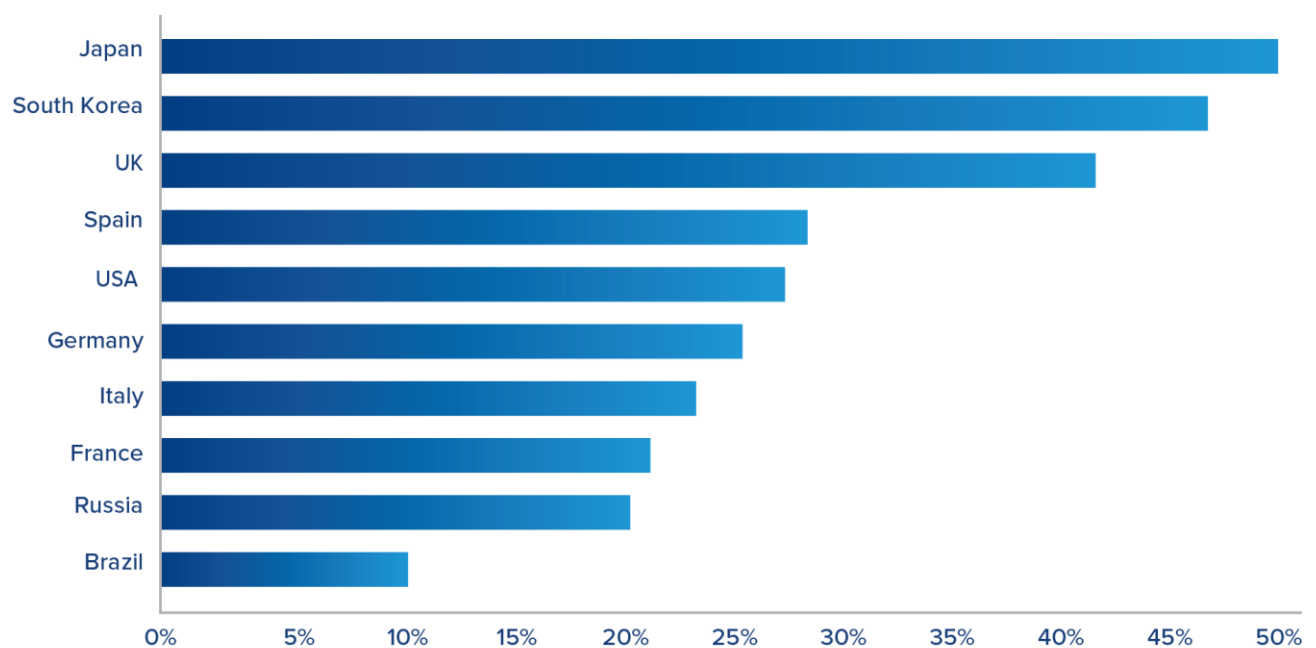
The number of users of mobile payments has risen continuously since 2009. Mobile payment solutions have yet to enjoy a major breakthrough in Europe – unlike in Asia, Africa and North America.

4.2 M-commerce: the most active shoppers are in Asia

By late 2014, almost half (49%) of all e-commerce transactions in Japan were carried out through mobile devices, closely followed by South Korea (48%). This underscores the power of the IT-driven markets in Asia, where consumers traditionally have a strong affinity with new technology. These countries are closely followed by the UK (which leads the trend in Europe), Spain and the United States. With around 25% of users shopping on mobile devices, Germany is below the international average of 30%. These figures are based on research carried out by Criteo with more than 3,000 online retailers with recorded sales of more than 130 billion US dollars.

The top ten countries for m-commerce

Japan and South Korea top the mobile shopping league



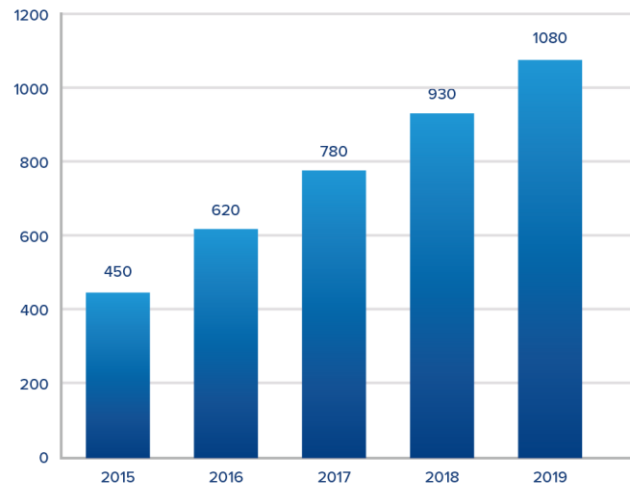
E-commerce transactions carried out using mobile devices, %, Q4 2014.
Figures are based on the value of transactions, accounting for more than USD 3 million in sales through over 3000 online retailers

Source: [Criteo/Statista](#)

4.3 The outlook: mobile transactions between 2016 and 2019

The volume of global financial transactions carried out using mobile devices is set to rise sharply in the coming years. In 2015, 384 million users of mobile devices made payments valued at 450 billion US dollars. Gartner Research expects this to rise to 448 million users generating sales of 620 billion US dollars, with the value of global mobile transactions exceeding one trillion US dollars in 2019.

Mobile payments: estimated sales in billion US dollars

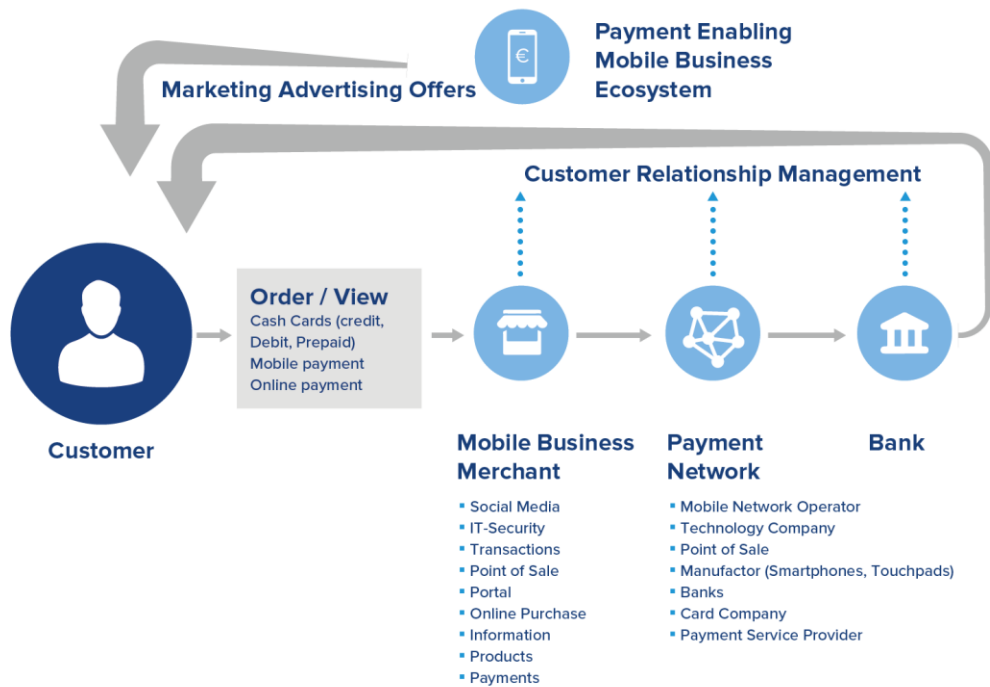


Source: [Statista](#)

5 The mobile business ecosystem

Key players in the new mobile ecosystem are not just the banks and FinTech firms, but also the mobile network operators, the providers of operating systems, hardware producers, online retailers and the providers of cloud solutions. The traditional banks have relations going back many years with customers; this is ideal for positioning themselves in the mobile payment market and integrating tried-and-tested authentication processes into the new ecosystem. To achieve this, however, they will have to come to terms with a growing number of statutory requirements, not only in Germany but also in other parts of the European Union.

The mobile business ecosystem



5.1 Proven business cases

5.1.1 Mobile network operators (MNO) centric models

Under this model, the mobile network operators (MNOs) offer independent mobile payment services. This is already the case in a number of emerging economies where only a small percentage of the population have a conventional bank account. One successful example of this is the money-transfer service M-Pesa, which was launched in Kenya as early as 2007 by Safaricom and Vodafone.

5.1.2 Bank-centric models

This is where a financial institution rolls out mobile payment services for the benefit of its customers, ensuring that the concept gains the required acceptance at the PoS in the retail trade. In this scenario, the role of the mobile network operators is solely to provide a network infrastructure.

5.1.3 Collaborative models

With this approach, banks work together with mobile network operators and one or several trusted third-parties.

5.1.4 Service provider models

Under this model, service providers start their own mobile payment system, independent of the financial institutions and mobile network operators.

Source: [Laetitia Chaix and Dominique Torre](#)

5.2 Market entry options

→ **Inch forward, step-by-step**

Activities are limited to experimentation with mobile payment models, concentrating on a limited range of services and markets.

→ **Go it alone**

A powerful player invests huge sums of money in developing the market and the scope of mobile payment options.

→ **Start an initiative with a ‘buddy’**

Two big companies enter the mobile payment market together. These are typically a mobile network operator and a banking investor. Several smaller companies can also join forces. For this to work, all parties will need to agree on a common business model.

→ **Open alliance**

Collaboration between several players operating in different areas of the value chain. The aim is to develop a common standard to make it possible to promote different types of payment solutions.

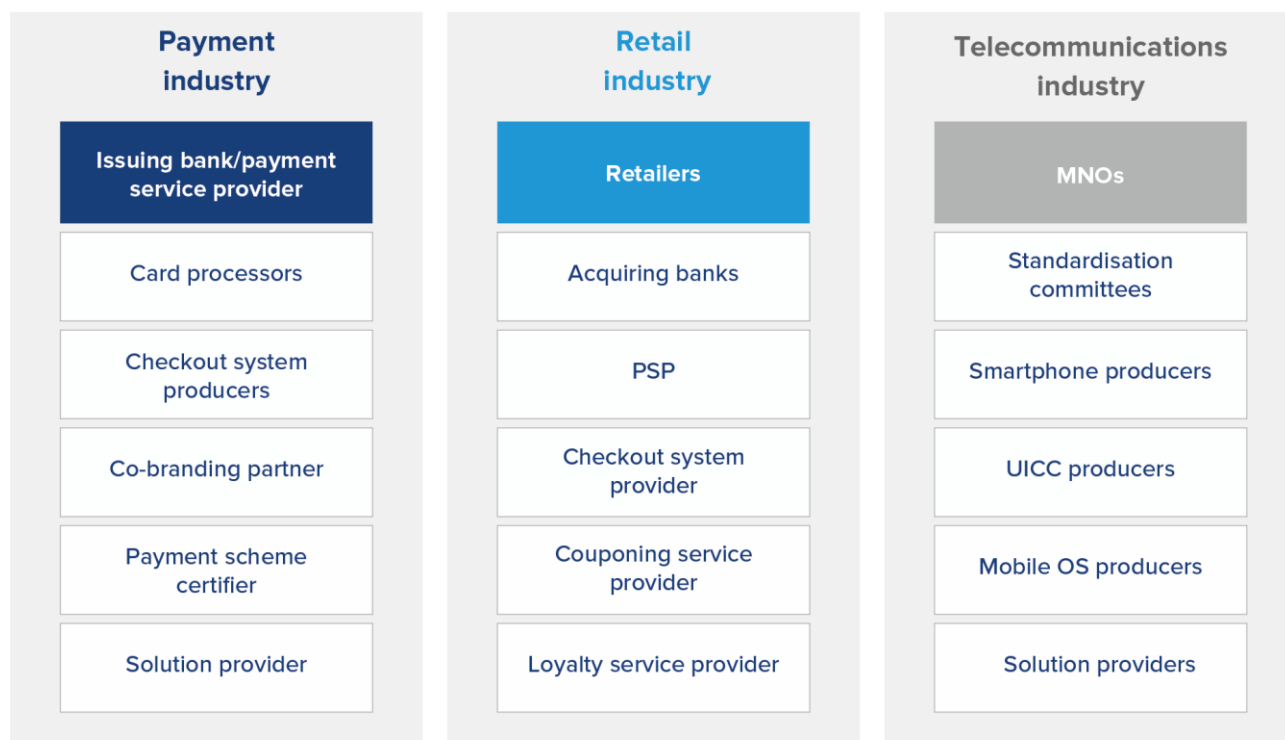
Source: [Altran Italia Technology Review](#)

5.3 Players from outside the industry are setting the standards

At first glance, the mobile ecosystem seems to be dictated by four different parties: the customers, the retailers, the banks and the mobile network operators (MNOs). In reality, however, the situation is a lot more complicated, as demonstrated by the market entry of ‘over-the-top’ players that are also gaining in importance. These include firms such as Google, Apple and Microsoft, who not only own a mobile operating system, but also have access to a broad base of customers who are open to added-value services through the internet. When it comes to promoting payment services, one aspect that works in favour of these brands is that they have permanent access to the consumer behaviour data of their clients.

Key players in the mobile ecosystem:

No changes for years



Source: Bitkom

5.4 The opportunity for banks

Banks have the right infrastructure and years of experience with payment services, putting them in an excellent position to occupy a central position in the mobile ecosystem. Typically, banks are also able to build on the trust that is earned from customers over a prolonged period. This is especially important when it comes to issues such as data protection. There is also the experience that many banks have with tried-and-trusted procedures that are in place for the online banking area, when it comes to registering users and creating authentication. Many of these are already suitable for integration into mobile wallet infrastructures and this makes it easier for customers to enter the field of contactless payments with a smartphone. However, in the longer term, there may well be substantial new competition from players outside of the financial industry. To gear themselves up to combat these competitors, banks will need to remain agile, and adopt innovative concepts that help enhance customer usability and loyalty.

5.5 Payment scheme certifiers and white label software

At present, digital credit cards are a solution that is already integrated into smartphone wallets offered by different mobile network operators. As a result, they are also accepted by bricks-and-mortar retailers. For example, in the United States, Mastercard is working with Citi, Capital One and Bank of America and this is making it possible for Mastercard owners to use their mobile devices to pay in a variety of outlets. A number of companies are also already actively using white label solutions in the mobile payment market, one of which is Wirecard.

5.6 Possible collaboration partners

Collaborations are sometimes fraught with problems in the mobile payments sector. The value chain is extremely complex, involving a large number of players from different industries, each with their own individual interests and business models.

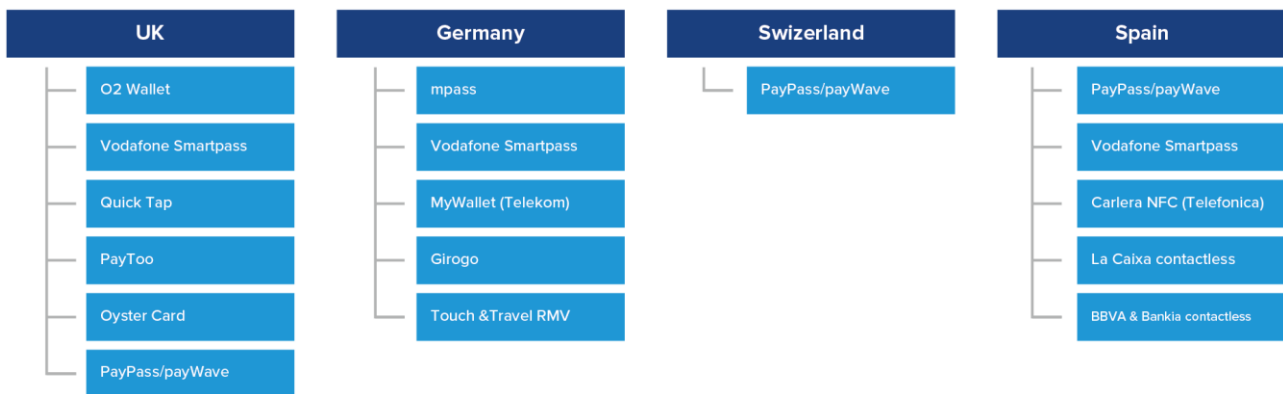
To establish contactless payments as a solution for the mass market, it is crucial that key players from different sectors work together – this includes banks, payment solution providers and retail chains with a sufficiently wide footprint. If each party provides support through their own special competences, there is every chance that this approach will work.

6 Providers of contactless payment systems, 2012 vs. 2016

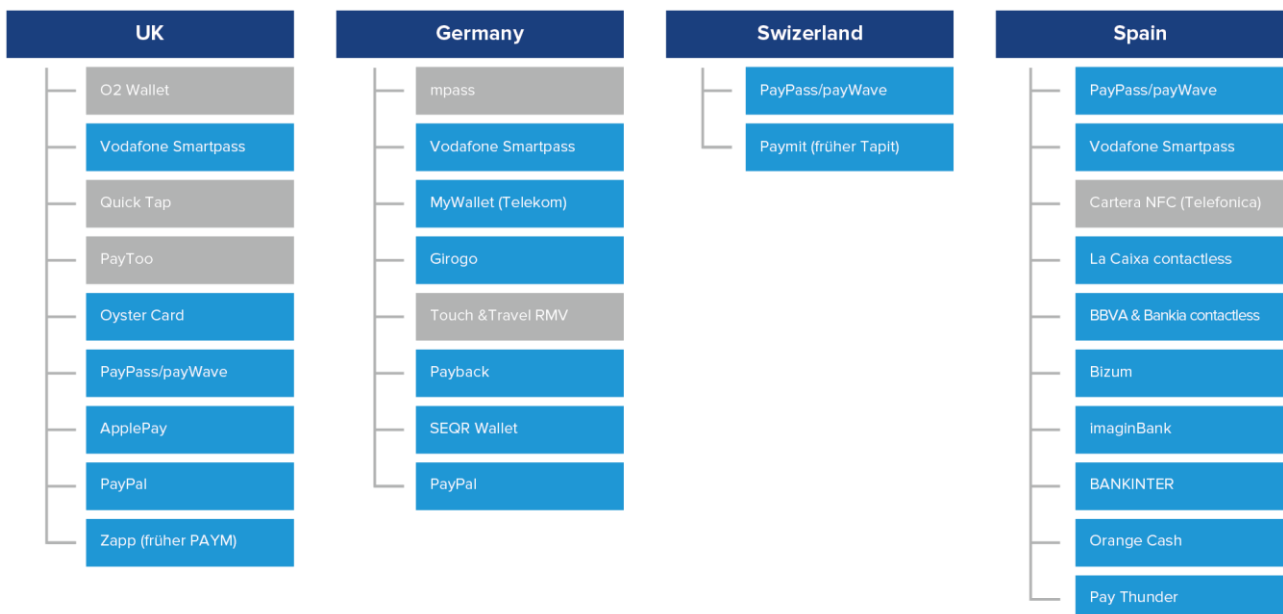
The paper written by GFT in 2012 examined the mobile payment market in Germany, the UK, Spain and Switzerland. At the time, there were 17 multinational providers in these four countries. By 2016 this number had risen to 25. A number of new providers entered the market in Germany and Spain. In the UK, three of the original providers withdrew from the market. The general focus at the moment lies in NFC and m-commerce. Four years ago, there was strong variation in the approach adopted by firms.

Contactless payment systems in the four key markets

Trends...



...and facts:



Including all NFC/contactless payment projects with undefined schedules, which have either started already or have been committed to.

6.1 The strategies of the key players

Google and others are mainly interested in mobile wallets for evaluating and monetising customer data.

6.1.1 Banks

If Android Pay and Apple Pay enter the market, this would weaken the standing of banks when it comes to payment systems. As a result, banks should be interested in collaborating with strong technology partners.

6.1.2 Credit card companies

Visa and Mastercard are clearly pursuing similar mobile payment strategies. Both firms offer an isolated solution and are collaborating with major mobile network operators. Their aim is to gain a similarly high standing as their position in the credit card market. To date, however, their efforts have resulted in little success in Europe.

6.1.3 Mobile network operators (MNOs)

The mobile network industry is increasingly focussing on collaborative approaches, such as the partnership between Vodafone and PayPal. Unlike previously, host card emulation (HCE) means it is now much easier to set up mobile payment solutions without the involvement of MNOs.

6.1.4 Third parties (e.g. fintech firms and retailers)

FinTech companies typically offer a particularly innovative or user-friendly payment app, but they need strong partners to introduce these apps to the market. Many of the retail chains (especially the leading grocers) offer their customers payment systems with an element of added value (e.g. exclusive discounts).

6.1.5 Technology firms and internet companies

Google and other successful technology firms are set to roll out their payment solutions throughout Europe, and as such they should be considered the most threatening assailant in the banking sector. In some cases they not only control mobile end devices (hardware, software, or both), but they also have access to a large number of customers. These companies are technology-driven and they are keen to work more closely with credit card companies. They may opt for an instant payment model in Europe. In an era of digital technology, customer data is a 'golden asset'. As a result, the internet companies are not so much interested in the mobile payment solutions themselves - instead, for them it is about analysing customer data and monetising this information.

7 Mobile payments in eight key markets

Developments are the same in the eight countries researched by GFT for this white paper. In most of the markets in the Western economies, PayPal is in a strong position as a payment service provider. Overall, the equipment required for contactless checkouts at the PoS is at an advanced stage, meaning there should be little problem rolling out mobile payment systems. When it comes to authentication, biometric processes are gaining rapid acceptance, it is only in the United States that one of the major mobile payment newcomers is focussing on QR codes (Walmart).

NFC is now practically the yardstick for mobile payment systems in all of the countries examined.

The eight countries researched by GFT at a glance:

Germany

No clear number one provider, but PayPal is in widespread use. By 2020, the recognised standard of contactless PoS terminals offering NFC will be available everywhere.

Spain

Until now no clear number one provider – although the recently launched Bizum is poised to become the market leader for P2P mobile payments as it is supported by banks covering 95% of the market. Extremely high availability of smartphones. Contactless PoS terminals are widespread.

United Kingdom

Highest m-payment use in all of the countries examined by GFT. PayPal is the number one payment service provider (PSP). NFC is available with biometric authentication and there is strict regulation.

Switzerland

No clear number one provider. Biometric authentication now established. Local PSPs are launching a common platform.

Italy

Jiffy is a strong local player in Italy. The P2P payments service has now topped 400,000 registered users. Jiffy was developed by GFT and the payment service provider SIA.

China

Three strong local players. Extremely rapid growth in recent years. First steps are also being taken to 'conquer' the European market.

USA

PayPal currently dictating market developments. NFC is standard but QR codes are also strong. Strict regulatory requirements.

Brazil

No clear number one provider. Retailers are leading the way for the market. NFC is the established standard.

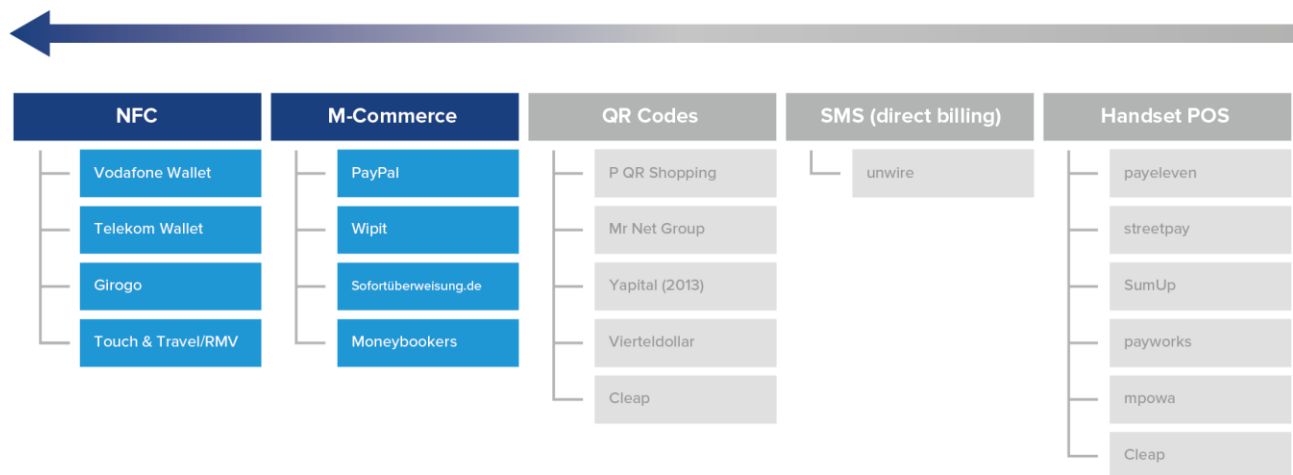
7.1 Mobile payments in Germany

91% of the population in Germany own a mobile phone and around two-thirds of users have a smartphone. Unlike in other countries, contactless payment systems are still niche. This will soon change, and by 2018 at the latest, all PoS checkouts should support contactless payments. The

trend for all providers is towards NFC. There is no clear number one in mobile payments. The most widespread solution is PayPal. For most companies, no authorisation is required for payments under 25 euros, but for larger transactions a PIN is required.

Mobile payments in Germany

Trends in 2012 vs. status in 2016



Source: [Mobile in Retail 2015/GS1 Germany](#)

7.1.1 State requirements and legal provisions

There are no state initiatives to promote the use of mobile payments, but attempts are being made by a consortium called GS1 Germany to lay down cross-industry standards for mobile payment systems. The statutory framework will be established on a European level – for example by the ECB (SecuRe Pay) and the European Payments Council (SEPA mobile, cards, transfers, direct debits).

7.1.2 Key market players

PayPal currently has 16 million customers in Germany. There are no figures for mobile users. To authorise payments, PayPal sends a text message to smartphones containing a security code. There are also options to use the SEPA direct debit system, SEPA credit transfer or giropay. Apart from QR codes, there is also increasing use of NFC, HCE and Bluetooth.

Wirecard is a provider of the leading white label solution in Germany. A payment service provider, it is also involved in a variety of backend systems provided to companies such as Deutsche Telekom, Vodafone, Telefónica (O2) and the transport company mytaxi. Its solutions work with SEPA direct debits, SEPA credit transfer, giropay, prepaid cards, credit cards and virtual credit cards. Its systems are compatible with NFC, HCE, Bluetooth Low Energy (BLE) and QR codes. There are plans to start working soon with the Chinese company Alibaba (Alipay).

The Sparkasse savings banks and **Volksbank** credit unions have announced that they will be issuing 10 million debit cards offering contactless payment options by the end of 2016. At the CeBit trade fair in March 2016, Deutsche Telekom and Vodafone presented a mobile payment system using smartphones based on debit card technology, but this is not widely available.

mpass was launched five years ago by German mobile network operators. Telefónica recently withdrew from the project. The system has a strong emphasis on the German market and it supports a variety of billing options such as SEPA credit

transfer, SEPA direct debit and instant transfers. The system uses NFC chips and international payments can be made with a virtual Mastercard (Maestro PayPass).

Payback entered the market in the summer of 2016. In the future, subscribers to the Payback loyalty scheme will be able to use their smartphone to make payments in a variety of outlets (dm, Kaufhof, Rewe, etc). This is a direct debit solution based on QR codes, NFC, BLE and geofencing.

7.1.3 Survey: which payment system is preferred by retailers?

For the parties involved in the market that were included in our survey, electronic direct debit systems are an important priority in the retail trade, followed by the more local Girocard system (formerly known as Electronic Cash or EC-Karte). Only after these do users mention credit card options.

	MNO	Wallet	ZNB	Banks	CC Companies	Position among retailers (%)
Debit card systems (Maestro - PayPass, V PAY - payWave)	67%	100%	75%	55%	100%	4. (63%)
Girocard (electronic case) Contactless/mobile	100%	80%	50%	91%	67%	2. (74%)
Electronic direct debit (ELV) Contactless/mobile	67%	100%	100%	64%	33%	1. (80%)
Credit card systems (MasterCard - PayPass, Visa - payWave)	33%	60%	75%	45%	100%	3. (71%)
Proprietary solutions (e.g. customer cards)	0%	20%	50%	0%	33%	5. (17%)
Others	0%	0%	0%	9%	33%	7. (0%)
GeldKarte (girogo)	0%	0%	0%	18%	0%	6. (17%)

Source: [Mobile in Retail 2015/GS1 Germany](#)

7.2 Mobile payments in Spain

At 80%, the penetration of smartphones in Spain was the highest of all countries covered by the GFT survey. Contactless payment systems are already established in the country, with more than 600,000 retailers (more than 70 per cent of the Spanish retail universe) offering them. There is no provider in a dominant position. The most widespread technology is NFC, although some providers also use QR codes. Payments over 20 euros are usually authorised with a PIN. Some smartphone applications do also allow for fingerprint authentication, such as the ImaginBank app from CaixaBank.

7.2.1 State requirements and legal provisions

There are no specific national regulations in place, instead use is governed by the comprehensive regulatory requirements of the EU. Banco de Espana would like to introduce a uniform platform before the end of 2016. This would allow customers to transfer money to other people in real time – independent of which bank they use.

7.2.2 Key market players

After a large period of turbulences in the Spanish mobile payments market, where several banks and third-party solutions appeared and disappeared, it seems that finally the banking sector has agreed on a payment standard: Bizum. Following its launch in early October 2016, we expect Bizum will replace the majority of the existing banking solutions in a short timeframe.

Bizum is a system for instant transfers and payments between mobile phones supported by 27 Spanish banks (representing 95% of the market). Rather than requiring a specific app, Bizum is integrated into the mobile banking applications of each of the participating banks and only requires activation of the service by the customer. Bizum users are able to send or request funds by just using mobile phone numbers.

In addition to bank proprietary apps, two alternative mobile payment solutions are also offered in Spain:

- Telco operator based solutions:

Vodafone Wallet and Orange Cash: the wallets offered by both mobile network operators are based on the same principles and use NFC and HCE technology. They work by emulating most of the Visa or MasterCard credit cards on NFC-compatible Android smartphones. These can then be used for contactless payments at more than 600,000 retailers in Spain and with Vodafone Wallet, international payments can also be made. Vodafone also offers other functions such as retail promotions, whereas Orange Cash can be used to pay for tickets on local transport networks (in Malaga and Valencia). There are also a variety of other mobile payment systems offered by banks and fintech firms in Spain.

- Mobile device based solutions

Samsung Pay: introduced in June 2016 in Spain, Samsung Pay is a mobile payment and digital wallet service provided by Samsung Electronics that lets users make payments using compatible phones and other Samsung devices. The service supports contactless payments using NFC, but also incorporates an electromagnetic transmission system that allows contactless payments to be used on payment terminals that only support magnetic stripe cards.

7.3 Mobile payments in the UK

The 60 million inhabitants of the UK have just under 90 million mobile devices and 66% of those are smartphones. Mobile internet use is more popular than in any other European country, with 75% of adults using the web on their mobile device. As a result, more mobile payments are made in the UK than in any of the other seven countries surveyed. PayPal is the clear market leader among payment service providers, which are strictly regulated by the state. NFC is the unrivalled technology standard, with QR codes only playing a secondary role. Biometric authentication has also become popular in the retail trade, which is fully equipped with contactless terminals.

7.3.1 State requirements and legal provisions

All transactions are regulated by Payments UK (www.paymentsuk.org) and all providers of payment services are obliged to follow its guidelines and adhere to strict entry requirements. Companies are also governed by EU regulations (SEPA, European Payments Service Directive, etc). A Government Digital Service Platform is also being developed to make it easier for people to transfer money to the authorities.

7.3.2 Key market players

PayPal is the strongest market player in the UK when it comes to mobile payments. PayPal is based on NFC technology and offers a payment solution that works with all mobile operating systems. As a result, it can be used extensively throughout the UK as well as at around 7 million retail checkouts worldwide (debits / credits). The company also launched a peer-to-peer platform in September 2015 called PayPal.Me. This can now be used to demand payments from others through a simple link sent in a text message.

VocaLink Paym is a P2P solution that is available to around 2.25 million customers in the UK. Launched in 2014, the platform makes it possible to transfer money directly from one smartphone to another, anywhere in the UK. To transfer money, only the mobile number of the recipient is required, with no need to enter or store bank account details on individual devices. Such a payment solution may provide a role model for similar services in other parts of Europe.

Apple Pay was introduced to the UK in July 2015 and is currently accepted at 250,000 locations in the retail trade. According to Apple, 3.6 million UK residents have already made payments with this service at least once. An NFC solution, Apple Pay does not allow retailers to access the customer's bank account details. Instead, it creates a dynamic security code for individual transactions. One of the highest profile supporters of Apple Pay is Transport for London (TfL), which supports the system in all of its public transport services (tube trains and buses).

7.4 Mobile payments in Switzerland

There are more mobile telephones (around 12 million) in Switzerland than there are inhabitants (8.3 million). There are a high percentage of internet-compatible smartphones (around 70%). As in the neighbouring country of Germany, no mobile payment provider occupies a dominant position in the market, but PayPal has the edge in the eye of consumers with its mobile app. Most of the other providers offer NFC solutions or biometric security options (fingerprint sensors).

The five biggest banks in the country (Credit Suisse, PostFinance, Raiffeisen, UBS and ZKB), recently came to an agreement with the financial infrastructure provider SIX, the Coop, the Migros retail group and the mobile network operator Swisscom to work together on a common mobile payment platform. The aim is for all market players to offer a customer-friendly solution with a variety of added-value services. The system is scheduled to be introduced in the autumn of 2016. Apple Pay also recently started operating in Switzerland but the launch only involved cooperation with a small number of banks.

7.4.1 State requirements and legal provisions

There are no major state restrictions for providers. There are standards for mobile payment systems and these are monitored by the Swiss ALPS Initiative (ALPS = Access Loyalty Payment Solution), a consortium run by Swiss card providers.

7.4.2 Key market players

PayPal has around one million customers in Switzerland and is accepted in 179 million locations worldwide. As in other countries, PayPal allows payments to be made through an app by providing a security code or by going online. Payments are billed to the user's prepaid card or credit card.

Paymit was introduced by several Swiss banks in 2015 as a white label solution. It can be used to make instant transfers from smartphone to smartphone within Switzerland. The app can also be used for shopping and in restaurants. It also allows money to be transferred via text message. Paymit is used by 90,000 people in Switzerland (through a credit card, direct debit or bank account). Paymit is set to become part of the joint Swiss mobile payment system in the autumn of 2016 (see above).

Twint was also launched in the Swiss banking industry in 2015 and it is currently used by around 50,000 people at just under 1,600 retailers. Twint is a prepaid solution and unlike Paymit, the system is based on QR codes and short-range Bluetooth technology. Twint will also become part of the Swiss payment platform.

7.5 Mobile payments in Italy

In Italy, there are around 150 mobile telephones for every 100 inhabitants. As in neighbouring countries, there is no individual provider that dominates the market. PayPal is also the most common system. Most mobile payments are made using NFC or fingerprint sensors to authorise payments.

7.5.1 State requirements and legal provisions

Payments are subject to European standards laid down by EBA – European Banking Authority – (SecuRe Pay) and the European Payments Council (SEPA mobile payments, cards, credit transfers, direct debits).

7.5.2 Key market players

PayPal also operates in the Italian market and has around four million users recently embarked on a cooperation with Vodafone making it possible to make NFC payments by using the wallet solution offered by the mobile phone provider.

Jiffy, the P2P payment service launched by SIA in 2014, has been currently adopted by 23 banking groups. These represent more than 80% of all Italian banking customers. With Jiffy it is possible to send and receive money in real time via smartphone. The system associates the phone number to the IBAN code of an account or of a card and enables the user to select a receiver from the personal contacts on the smartphone. Jiffy, developed by SIA in collaboration with GFT, is compliant with the standards of the European Retail Payment Board (ERPB) and already set up to be integrated with the pan-European instant payment infrastructure.

Visa Direct is a P2P service offered by the international credit card company. It allows users to transfer money directly to credit card owners. There are also a large number of smaller providers in the Italian market, such as **Hype**, **2Pay** and **Chat & Cash**.

7.6 Mobile payments in the United States

There are 332 million people living in the United States and 190.5 million registered mobile phones, of which 66% are smartphones that can be used for internet access. There is huge interest in mobile payments and in 2015, roughly 23 million Americans used mobile devices for their shopping. Most mobile payment solutions rely on NFC technology and QR codes are of secondary importance. Many banking apps also allow customers to pay bills immediately.

7.6.1 State requirements and legal provisions

There are a number of regulations in place, including the Electronic Fund Transfer Act (EFTA), Regulation E, the Truth In Lending Act (TILA), Regulation Z, and more.

7.6.2 Key market players

PayPal is the clear number one in the US with an estimated 173 million customers. The company's services became even more attractive to customers in September 2015 when it introduced the P2P payment system PayPal.Me. This allows users to demand payments via email or chat messages.

Walmart Pay is the most recent entrant to the mobile payment market and it has already attracted around 22 million customers. The retailing giant does not use NFC technology, instead it issues one-off transaction codes at the checkout, which can be scanned by smartphone cameras. Receipts are automatically saved to the Walmart app.

Android Pay (currently only available in the US) and **Apple Pay** are both linked closely to the mobile operating systems of the internet giant Google and Apple. Although it does not publish exact figures, Google talks about having 'millions of users'

and Apple Pay is said to be used by around 3.6 million iPhone owners. Whatever the exact numbers, both companies use the same technology base (NFC, credit cards or direct debits).

7.7 Mobile payments in Brazil

Brazil has around 200 million inhabitants with around 260 million mobile phones, and is a faster adopter of new technologies than many other nations. This makes Brazil one of the pioneers of mobile payment systems. The first schemes were launched as early 2001 / 2002 based on QR codes, and since 2013, most progress has been in the use of NFC. There is no clear market leader until now and the strongest driver of mobile payment systems is the retail trade. There has been a strong rise in the use of mobile devices over the last three years and this has driven even greater interest in mobile web-based services.

7.7.1 State requirements and legal provisions

A law called MP-615 (Provisional Measure) was introduced in 2013 to ensure the regulation of payments made via mobile devices to companies not belonging to the banking industry.

7.7.2 Key market players

Cielo Mobile was launched in 2012 and is the most popular mobile payment solution in Brazil with 650,000 customers. To initiate a money transfer, users connect their mobile to a device at the PoS via Bluetooth. Payments are then authorised by entering a password. Cielo Mobile supports all common credit cards and direct debit systems, but it can only be used in Brazil.

MPO (Mobile Payment Operator) has been operating in the market since 2013 and has formed a partnership with two banks, Banco Bradesco and Claro. Around 300,000 customers use this NFC solution for their mobile bank transactions or to pay for shopping items using contactless technology.

Banco do Brasil launched its payment app in 2015. The system works with NFC-compatible Android smartphones (Android 4.4 or higher). To pay in a retail outlet, customers open the app, select the virtual wallet (for debits or credits) and hold their mobile next to an NFC reader. For payments of more than 50 Brazilian real (around 15 euros), users also have to enter a password.

7.8 Mobile payments in China

There are around 1.3 billion mobile telephone users in China. A good half of those devices are smartphones (51 per cent). The payment market in China is dictated by three major players (Alibaba, Tencent and Baidu) and they are experiencing stupendous growth. In the third quarter of 2014, the value of transactions made via the internet was over 328 billion US dollars – 41.9 per cent higher than the previous year. With a market share of around 50%, Alipay is currently the leading mobile payments provider. Market observers believe that Alibaba's services will soon be outpaced by its competitor Tencent (WeChat, QQ), which has upgraded its popular social media platforms to include a mobile wallet. Unlike Europe, NFC technology is of secondary importance in China, which is dominated by QR codes and barcodes. In late 2015, Alibaba also embarked on the [introduction of face recognition](#) for payments.

7.8.1 State requirements and legal provisions

Little is known about laws or regulations affecting the mobile payment market.

7.8.2 Key market players

Alipay was introduced by Alibaba, China's biggest e-commerce company, as early as 2004. It currently works in partnership with at least 19 national and 40 regional banks. Alipay is the number one in the Chinese mobile payment market by a long shot. It accounts for 78 per cent of all mobile transactions carried out by around 350 million users (debits, credits, online banking). Apart from the classic functions, the Alipay wallet app also offers P2P payments between users of the service, money transfers to other bank accounts within two hours, direct payment of household bills and personal finance offers. The technology used by the application also dictates the pace. In late 2015, the company started introducing facial recognition logins for payments made with Android and iOS smartphones. Thanks to a partnership with the German payment services provider Concardis, Chinese tourists can now also use Alipay to make payments in a selection of German retail chains and hotels.

Tenpay is a service provided by the internet company Tencent, which is also behind the popular message services **WeChat** and **QQ**, plus a variety of other internet services. Launched in 2005, Tenpay has 1.2 billion users and its current share of the mobile payment market stands at 20%. This is likely to rise sharply in the coming years because of the app's direct link to WeChat which allows users to pay for products directly through social media (debits, credit, online banking). Weixin's WeChat service also offers ways to pay bills, transfer money to other people, shop through the internet and much more. WeChat is in widespread use in cities whereas the users of the **QQ Wallet** provided by Tencent are mainly in smaller urban areas. Authentication is based on QR codes, barcodes and even sound waves.

Baidu Wallet is a service offered by the internet provider Baidu, which is the biggest search engine company in China. Baidu's wallet only entered the market in 2014 and it is linked to a variety of the company's other apps and services. It offers interbank transfers for free, lets users pay for online purchases and utility bills, and is likely to become a strong contender to Alipay and Tenpay.

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8 Impact on financial services providers

8.1 The most promising players

Because Apple, Google and Microsoft have control over the ecosystem behind iOS, Android and Windows Mobile, new entrants struggle to sidestep the powerful corporations in the mobile payment market. Samsung is an Android partner, but it has its own m-wallet.

There is no doubt that mobile payment systems have a major influence on developments in the financial services market. New value chains are being created and it is not possible to say as yet what impact this will have on market players. It is clear that the banking industry will have to steel itself for sweeping change. For centuries, they have held the reins with respect to the processes behind commercial transactions, but now industry outsiders have entered the ring and are challenging the classic role played by the financial institutions.

The first contender in this respect has to be PayPal. When it comes to user-friendly payments through the internet, this online payment service is the number one in the United States and many western European countries. Its aim is to occupy this position in mobile payments. Recently, PayPal announced a full-scale partnership with Visa in the United States and this will open doors to checkout terminals in shops. PayPal customers will soon be able to use their smartphone to make contactless payments at all card terminals in the United States. Visa is also pushing to set up similar arrangements in other countries. PayPal will not just make it possible to pay in shops with a Visa card, but also with other types of cards linked to the online service.

There are also four other major global players exercising tremendous pressure on the banking industry, linking their control over operating systems with innovative hardware (smartphones, tablets and wearables) and disruptive business models. The big four are Apple, Google, Microsoft and Samsung, and they all have their sights firmly fixed on the mobile payments market. Android Pay (from Google) is currently only available in the US. Apple Pay is already operating in the US, Canada, Australia, China, Hong Kong, the UK, France and Switzerland. Samsung recently started operating in Spain with Samsung Pay, after originally starting in its home country of South Korea, as well as China and the United States. Microsoft will initially only make its wallet available to selected customers in the United States. One thing all these solutions have in common is that they simplify the customer journey for payment processes in the long term. With their customer widespread customer engagement, these new entrants are sure to have a huge impact on the mobile payment ecosystem.

One additional factor that could also pose a threat to financial institutions, is the rapidly expanding area occupied by FinTech firms, just one example of which is the Berlin-based banking start-up Number 26 (N26). The European Central Bank and the German Federal Financial Supervisory Authority BaFin recently issued the new company with a full banking licence, meaning that N26 will also be able to operate at an international level as a fully fledged financial services provider.

Impact on the financial sector

A comparison of the four major players

	Hardware control	Wallet brand	Biometrics	OS control
Apple	iPhones & iPads, Apple Watch, Apple TV	Apple Pay No white label options, no co-existing NFC wallets by others.	TouchID	iOS
Samsung	Galaxy phones & tablets, GalaxyGear Wearables, SmartTV	Samsung Pay. No white label option, co-existing wallets possible	Fingerprint scanner	Very little control, except with Tizen OS
Microsoft	Lumia, Surface, Xbox, MS Band, (HoloLens)	(MicrosoftWallet)	MS Band, Microsoft Hello	Windows Mobile, Windows
Google	Android1 chip, Nexus phones and tablets	Android Pay Possible white label option, co-existing wallets possible	Fingerprint scanner in AndroidM	Android OS (ChromeOS)

■ Complete control and monitoring
 ■ Partial control and monitoring
 ■ No control or monitoring

Source: www.itu.int

8.2 The issue of data sovereignty

In most countries, it is forbidden for banks and financial institutions to use data relating to payments outside the company. The same applies to transactions carried out online or with a mobile device. Things are different in the digital world of the internet, however. Customers consider all of the information that they provide to be their personal property and sellers consider it information that belongs to them, which the customer left behind when they bought the product. The financial institutions have always been responsible for the security and confidentiality of all transaction processes. As a result, it could be argued that banks should have first access to any customer information that is gathered. This is an important issue when it comes to the future of the mobile ecosystem, and there is still need for clarification in this respect.

8.3 Regulatory guidelines of the European Union

The banks will be faced with sweeping changes in the near future and these entail risk with respect to costs. PSD2 will result in the transaction market in the EU opening up to 'payment initiation service providers' and 'account information service providers'. This will all revolve around Access To Account (XS2A) regulation, which obliges banks to provide third parties with free access to the account information of their customers. Opening up payments to non-banks will result in a variety of new third party payment (TPP) providers entering the market. This is likely to lead to numerous new forms of banking platforms and other services.

There is also the fact that a new EU regulation on multilateral interchange fees (MIF) demands a cap on interbank fees for domestic and foreign card fees. This would limit the fees to be paid by retailers to 0.2% or 0.3% of the transaction value for

debit cards and credit cards respectively. The upper limits also apply to the majority of transactions carried out with a Mastercard or Visa card. These and other legal provisions mean that the banks will have a number of difficult tasks to face in the coming years, and there will be a number of landmark decisions to be made.

8.4 The importance of interoperability

When companies from different industries are thrown together in a new ecosystem, the big challenge is interoperability. With mobile payment solutions it is important to gain as much acceptance from customers as possible. The magic word in this respect is convenience. The customer experience must always be uniformly positive, irrespective of whether customers access a new ecosystem through a High Street bank, a credit card, the provider of a mobile device or a mobile network operator. It is also important that different networks within the ecosystem are compatible. Proprietary solutions are unlikely to succeed in the long term.

8.5 Reducing costs to society

Mobile payment solutions are an opportunity for banks to reduce the societal cost of transactions as efficient cashless payment volumes rise. Societal costs can be seen as expenditures that are incurred in society for developing payment systems and making them available. Although hard cash creates the highest societal costs of all payment methods, it is currently the most popular format of payment – especially in Germany.

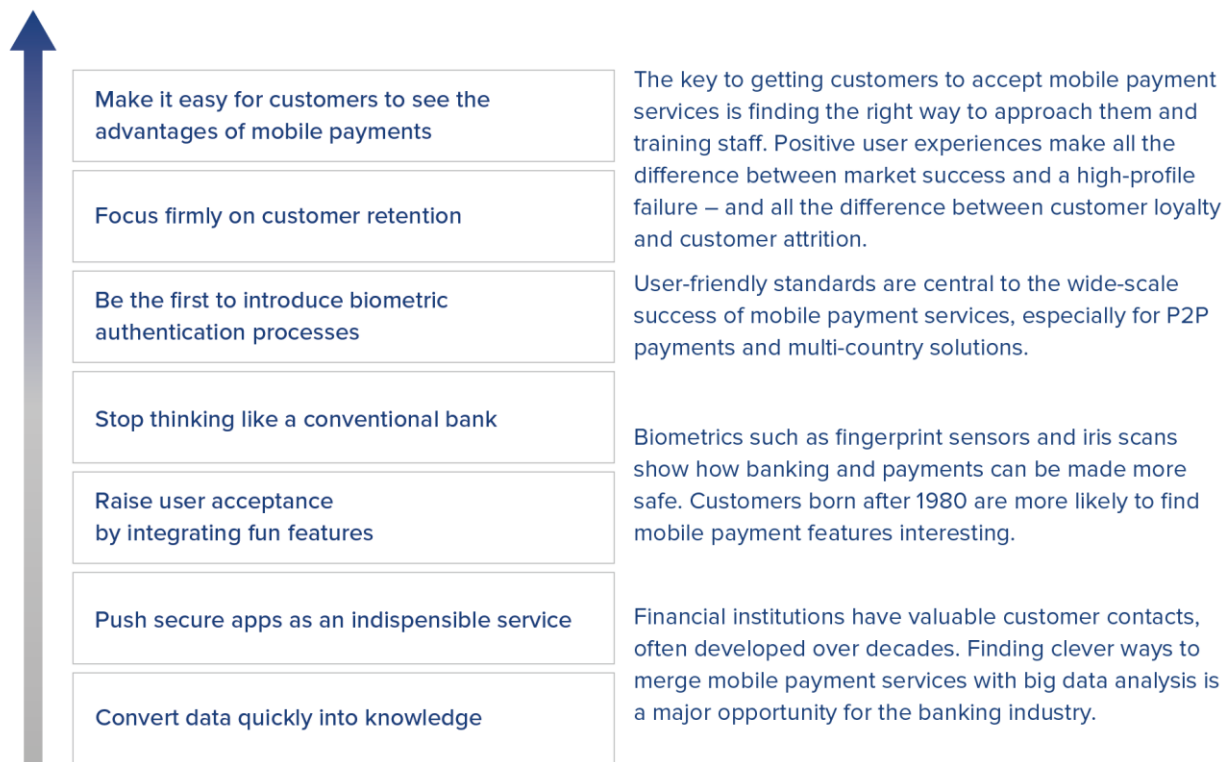
9 Recommendations for the financial services industry

Derived from the accumulated insights resulting from this analysis, GFT has drafted a series of recommendations relating to business models, market development and possible collaboration methods.

9.1 Focus I: the customers and their needs

GFT recommendations

The focus must lie in the user experience



9.2 Focus II: mobile strategies for the future

- Mobile payments are not a USP in themselves, they are a door-opener to mobile business
- Look for a USP in the value chain and create one there, not within individual functions
- Supplement functions with a white label solution or use of a platform
- Develop a brand for the value chain (including a USP), or for a role as a payment provider
- Learn from agile methods in order to react to changes and disruptive competition
- Be aware that further EU deregulation and tighter security standards will continue to shake up the financial services market for years to come
- Collaborate with other banks, payment service providers, FinTech firms and mobile wallet providers
- Try out new business models with customers, partners, or both – including non-bank services for m-wallets or similar platforms