

A hand in a dark suit sleeve holding a white mobile phone. A bright yellow beam of light originates from the top right corner and points towards the phone. A series of vertical white lines of varying lengths extends from the left side of the frame towards the phone, creating a sense of motion or data flow.

# Mobile money 2011

Mobility redefined



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# Foreword



## Vincent de La Bachelierie Global Telecommunications Leader

One of the most exciting new areas for the telecoms sector is the growth in mobile payments. As the smartphone is becoming so central to what we do day-to-day, it's no surprise we're seeing new ways of using the handset to pay for things. Meanwhile, mobile's status as a far-reaching infrastructure is bringing many emerging market users into the financial system for the first time.

Here at Ernst & Young, our team in the Mobile Money Office started by helping our clients draw up strategies for mobile money services. Three years later, those plans are now a reality. And all players are working toward making their business profitable, compliant with regulation and – most importantly for the customer – secure.

This overview is intended to highlight some of those big questions still facing leaders of telcos, technology, retail and banking, as they consider opportunities in

the mobile money space. It forms part of a series of publications on mobile money produced by Ernst & Young's Global Telecommunications Center.

Looking ahead, we will continue to comment on the salient issues as they arise, in a burgeoning mobile money landscape. Many thanks to all our colleagues who have worked on this report.

A handwritten signature in black ink, appearing to read 'Vincent de La Bachelierie'.

**Vincent de La Bachelierie**  
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# Key messages

With the advent of mobile money services, the nature of money itself is changing. Mobile money represents greater convenience to end users as payments move away from paper transactions.

To date, mobile money is composed of multiple closed systems. This multiplicity undermines its long-term potential, which depends on convenience and scalability. At the same time, new value chains are forming, driven by technology, use case and pre-existing payments landscape.

Governments and regulators must decide on the appropriate policy framework for mobile money services. Much will pivot on whether mobile money is considered an extension of existing payment mechanisms or a unique channel. Proportionate regulation and cross-industry incentives have an important role to play.



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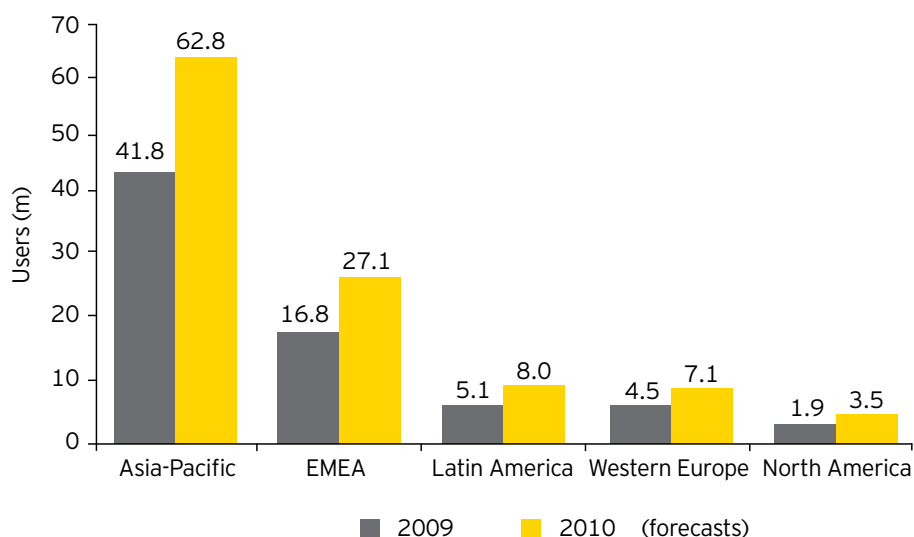
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# 1.

# Introduction

As the telecommunications sector turns to a new growth agenda, mobile money services are becoming more important than ever. The acceleration of mobile remittance services alongside new mobile payment scenarios highlights the range of opportunities for the mobile phone to redefine the movement of money by lowering costs, increasing convenience and reducing fraud.



Figure 1: Mobile payment users by region 2009-10 forecast<sup>1</sup>

Overall, mobile payment services are expected to reach US\$245b in value worldwide by 2014.<sup>2</sup> At the same time, mobile money users are expected to total 340m, equivalent to 5% of global mobile subscribers.<sup>3</sup> To date, many of the most successful services worldwide have originated in developed Asia – where mobile contactless services are well established – alongside money transfer services in emerging markets such as the Philippines and Kenya.

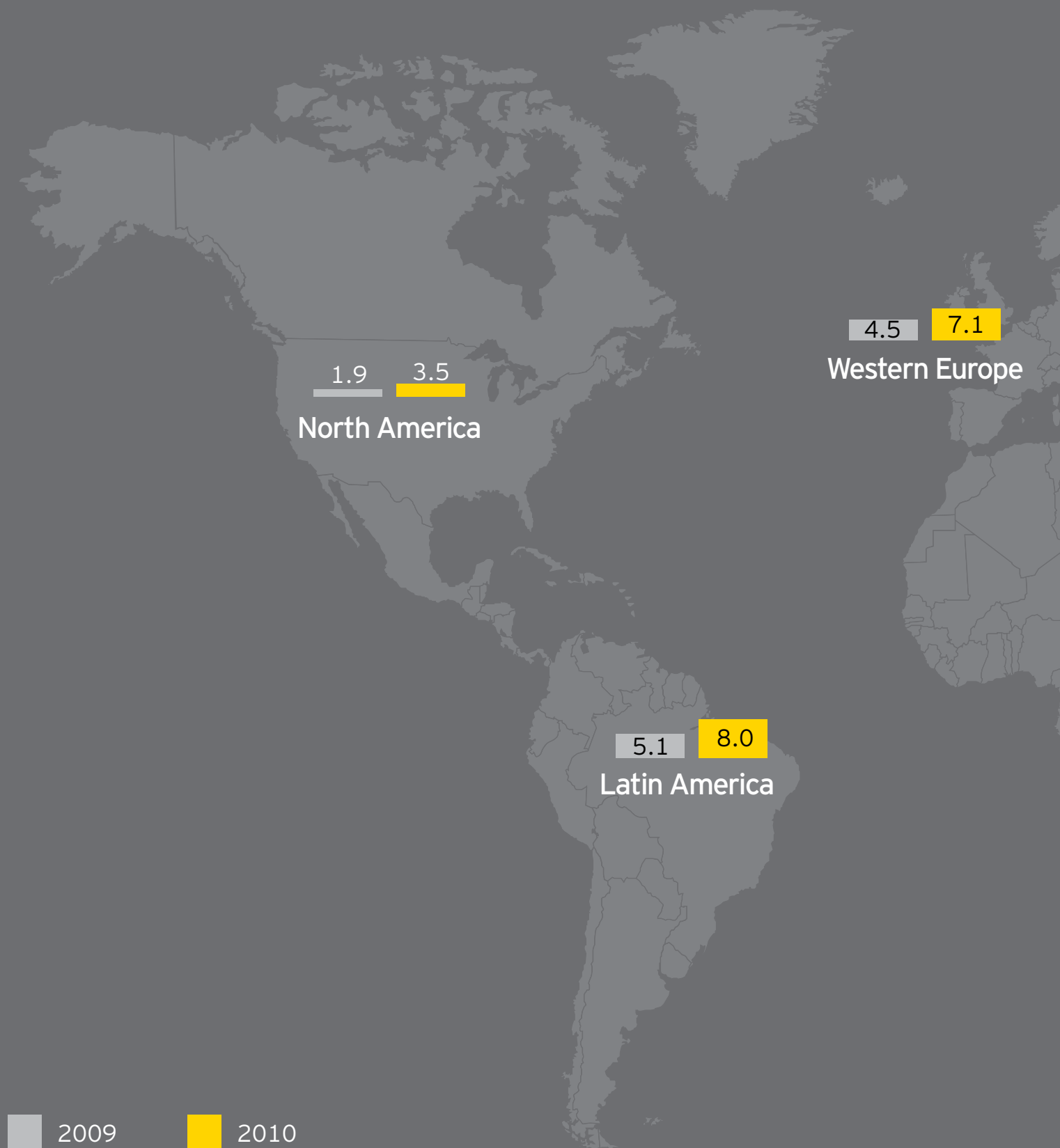
Operator-led money transfer services have gained traction due to factors such as the high penetration of handsets compared to bank accounts and benign regulatory environments. However, opportunities have yet to be exploited in many developed markets, where financial inclusion is higher and where there is a greater diversity of existing payments channels. In these countries, the mobile channel is more closely connected with the development of electronic payments, while the disparity in coverage levels between banking and mobile infrastructure in emerging countries gives the mobile channel a more singularly transformational role.

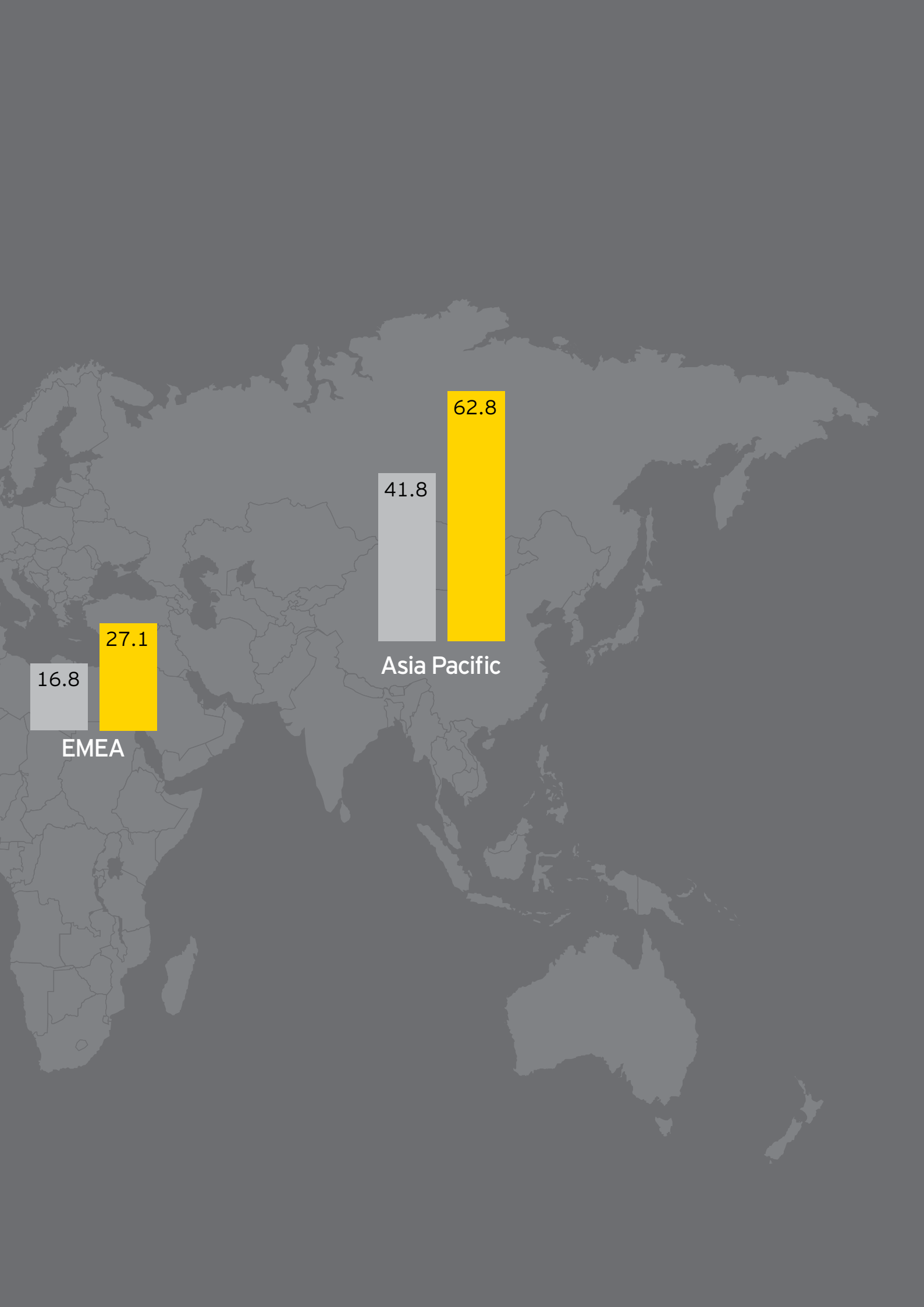
<sup>1</sup>"Gartner says number of worldwide mobile payment users to reach 108.6 million in 2010," Gartner, 21 June 2010.

<sup>2</sup>"Market Insight: The Outlook on Mobile Payment," Gartner, 10 May 2010.

<sup>3</sup>Ibid.

# Mobile subscribers – worldwide (in millions)





16.8

27.1

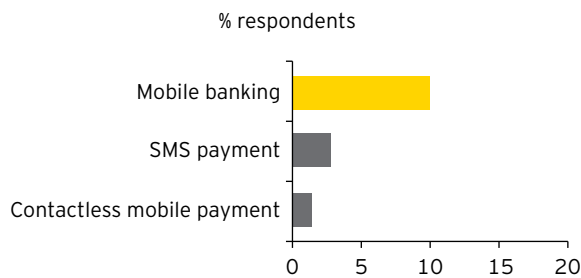
EMEA

41.8

62.8

Asia Pacific

**Figure 2: Adoption of mobile financial services in the United States (2009)<sup>4</sup>**



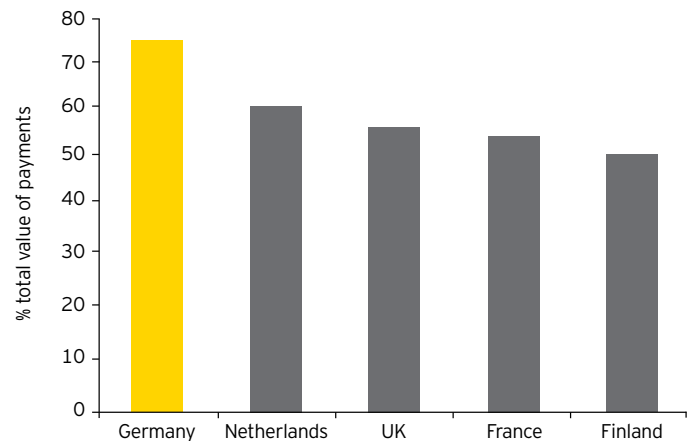
## Moving beyond a cash-based society

One of the most important considerations for mobile and electronic payments is their role in the long-term move away from a cash-based society. In Europe, cash accounts for four-fifths of total payment transaction volume. While end users perceive cash as free, it is actually a cumbersome payment instrument, involving costs of handling, transport and security.

Research shows that a 1% increase in card usage generates a 0.039% increase in consumption and a 0.024% increase in GDP.<sup>5</sup> Meanwhile, cash transactions create spare change that leaves the economic system, hurting consumption. For example, the Dutch central bank has reported that the annual cost of cash in the Netherlands stands at €300 per family, annually.<sup>6</sup>

Excluding consumers, the social cost of cash stands at around 0.500% of GDP in many European countries. Those countries with lower cash costs as a proportion of GDP have more diversified retail payment systems.<sup>7</sup> Although the use of cash as a means of payment is declining, it still accounts for the majority of payments value in many markets.

**Figure 3: Cash use as a proportion of total payments in selected European countries<sup>8</sup>**



<sup>4</sup>“Survey of Consumer Payment Choice,” Federal Reserve Bank of Boston, December 2009 (2000+ respondents).

<sup>5</sup>“The Impact of Electronic Payments on Economic Growth,” Visa, March 2010.

<sup>6</sup>“Is a Cashless society on the cards?” *The Daily Telegraph*, 11 January 2010.

<sup>7</sup>“SEPA FOR CASH, The Single Euro Cash Area, Towards a more efficient European cash society”, *European Payments Council, Newsletter*, January 2011.

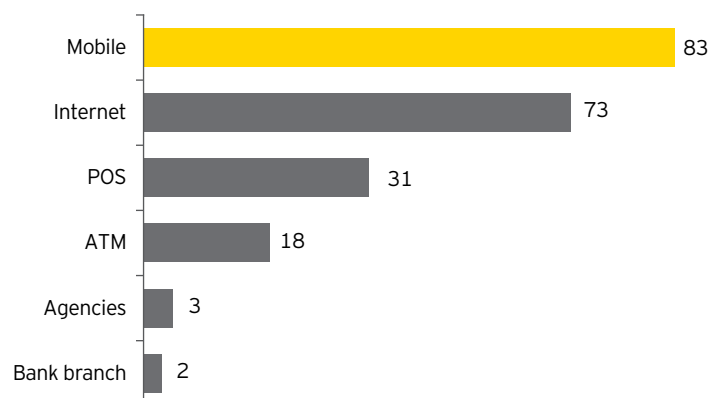
<sup>8</sup>Ibid (excludes consumers).

The advantages of a better-established electronic payment system – including mobile – are clear, in terms of convenience. Cash transactions last 34 seconds, compared with 27 seconds for card-based PIN payments and 12.5 seconds in a contactless scenario.<sup>9</sup> The mobile handset has additional advantages in terms of convenience and functionality due to high population penetration and integration with the online world.

While the mix of payments instruments continues to change, the internet is redefining the very notion of money. Social networking sites and online gaming are witnessing a surge in payments driven by virtual currency. In addition, micropayment functionality represents a hitherto untapped area for online payment platforms.

Figure 4: Forecast importance of global payment channels<sup>10</sup>

**Q. What are the three payment channels which will experience the greatest growth in importance in your country over the next five years?**



<sup>9</sup>“Contactless payments: Time to wave goodbye to cash,” *The Guardian*, 2 October 2010.

<sup>10</sup>“Global Trends in Payments Systems,” Edgar Dunn, December 2009 (survey sample of 645 representing 49 countries).

## 2.

# Mobile payments in focus

## Broadening momentum

Mobile payments can refer to a wide range of services. Basic mobile banking services have existed for a decade, while many established mobile remittance services began life as peer-to-peer airtime transfer services. At the same time, early mobile web and Wireless Application Protocol (WAP) interfaces for mobile payment have progressed to include payment on mobile application storefronts and online wallets on the handset.

Looking ahead, the mobile handset is seen playing a key role in services that combine payment with related customer data around purchasing preferences and identification, such as customer loyalty programs and event ticketing. Examples of innovative mobile payment applications include transportation payment services in France, hotel key services in Sweden and a home health care initiative under way in the Netherlands. Transport and ticketing are areas where contactless payments represent a strong value-add in terms of speed and convenience.

The mobile payments marketplace is a complex one. SMS-based services are the best-established, while other mobile payment channels, such as mobile internet and near field communications (NFC), have relied upon associated developments in web services and device capabilities. The range of players involved in the mobile payments ecosystem; its integration with the online world; and its role in both remote and point-of-sale (POS) payments all suggest that the marketplace will continue to evolve rapidly.



Figure 5: Mobile payment technologies and scenarios<sup>11</sup>

	SMS	NFC	Mobile internet
Payment type	Person-to-person Person-to-business Business-to-person	Person-to-business Business-to-business	Person-to-person Person-to-business
Use case	Domestic remittance International remittance Branchless banking	Contactless payments Identification- and marketing- related services	In-app payments Mobile wallet transactions
Characteristics	Payment services for the unbanked and underbanked	High levels of cross-industry collaboration	Extension of online payment services
Examples	Salary payments (Roshan, Afghanistan) Money transfer (M-PESA, Kenya; Obopay)	Transit payments (Mobile FeliCa, Japan)	Mobile wallet (Paypal, Zong, Starbucks)
Payment providers and enablers	Start-ups Mobile operators Money transfer companies Handset manufacturers	Card issuers Mobile operators Handset manufacturers Merchants Start-ups	Web services players Start-ups Mobile operators Merchants
Mobile operator participation	High	Medium	Low

<sup>11</sup>Ernst & Young analysis.

## Newcomers are driving change

Smartphone penetration allied with a more mature e-commerce market is producing a new wave of innovation in handset payments. For POS payments, start-ups are driving solutions that bypass the need for handsets with built-in NFC capability. For example, US-based DeviceFidelity has launched an iPhone cover that features an NFC-enabled micro Secure Digital (microSD) card which supports Visa's PayWave service. Meanwhile, a mobile application called FaceCash includes features that allow users to split their restaurant bills, an activity that takes place 1.2 billion times a year in the US.<sup>12</sup>

Other innovations at the device level include Square, which allows smartphones to read card readers using the headphone jack on the handset. The plastic card reader is given away free of charge to interested parties and 2.75% is levied on the person processing the credit card. Beyond this, there are various solutions that promote the use of contactless stickers on handsets.

The role of credit card issuers remains fluid as they look to boost acceptance rates in developing markets and offer additional value-added services. While participating in NFC trials, they are also exploring new approaches involving microSD cards. Meanwhile, large web and technology players are also looking for opportunities in the payment market, and are filing patents for mobile payments. Even payment hardware providers are getting involved. VeriFone has launched a smartphone card reader.

Regardless of their sector origins, many players are positioning themselves for shopping using the mobile. Taking their lesson from the e-commerce revolution, no one wants to be left behind: as much as half of in-store shopping is influenced by the web and there are many different players who want to leverage this new type of customer experience.

## Innovations in mobile payment: Bling Nation

US start-up Bling has created a sticker that customers attach to their handsets for contactless payment. The service partners with banks and, crucially, also offers merchants "Bling Nation" credit card machines that scan chips. Bling has partnered with payment terminal manufacturer Verifone, while tie-ins with social networking and internet payment players are helping to boost scale for what began as a local service. The 1.5% fees compares favorably with typical credit card commissions.



<sup>12</sup>"Advancing from In-Person Cash to Electronic," *Credit Union Times*, 10 January 2011.

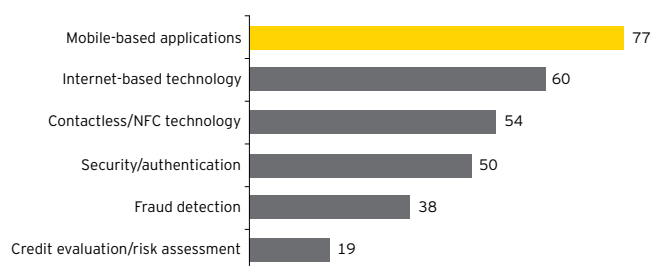
Online applications are also catalyzing mobile transactions. SMS-based payments are being used for micro-transactions in online gaming; the lack of marginal cost for virtual goods means that high transaction fees have been tolerated. At the same time, the likes of Zong are offering mobile payment solutions for mobile application developers.

In this light, the risk of disintermediation for operators is rising in what is a fragmenting marketplace. Nevertheless, leading mobile players are ramping up their plans for NFC in developed markets. Orange has announced plans to roll out NFC-based SIM cards to most of its European operations by the end of 2011, while O2 UK is also preparing for a push, using NFC not just for payments but also location-based advertisements, as part of its proximity marketing concept.

In emerging markets, operators are repurposing existing money transfer services into person-to-business payments. For example, in both Mexico and Kenya, merchants allow customers to pay via existing mobile remittance functionality. In these cases, the near real-time nature of SMS and Unstructured Supplementary Service Data (USSD)-based money transfer can be repurposed for customer-to-business (C2B) payment.

**Figure 6: Forecast importance of global payment technologies<sup>13</sup>**

**Q. Which three payments technologies will experience the greatest growth in importance in your country over the next five years?**



## As innovation increases, so do risks

As smartphones and mobile applications spread, widening the options for a mobile payment experience, they also carry with them the threat of reduced data integrity. In 2010, US banks updated their smartphone apps after it was revealed that they stored account holders' usernames and passwords on the phone in plain text.<sup>14</sup>

While poorly configured apps represent one security issue, the threat of mobile software malware is an ongoing concern. Although a market landscape of five separate mobile operating systems can help limit the spread of malware, there is still plenty of anxiety in the industry. Yet solutions are appearing, such as protection apps for Android, BlackBerry and Windows Mobile phones. However, mobile technology players also need to educate the customer, making clear what data can be accessed by downloaded apps.

End users require assurances that new services are useful and that their data is secure. Customer transaction histories can be repurposed in new ways, as part of advertising and loyalty programs, for example, but operators and technology players will need to treat customer data with care.

In emerging markets, the risk profile for mobile money services is exacerbated by the issue of financial inclusion. The availability of mobile money to users without bank accounts could overwhelm the ability of service providers and regulators to address consumer protection adequately. Moreover, increased know your customer (KYC) requirements could complicate accepted approaches to customer acquisition in the mobile market.

<sup>13</sup>“Global Trends in Payment Systems,” Edgar Dunn, December 2009 (survey sample of 645 representing 49 countries).

<sup>14</sup>“Banks Rush to Fix Security Flaws in Wireless Apps,” *Wall Street Journal*, 5 November 2010.

## 3.

# Improving the mobile money ecosystem

## The importance of state backing

Given the different entities, contrasting motivations and unique technological issues involved, government support will play a vital role in establishing new mobile payment channels.

The French Ministry of Industry awarded funding to various NFC projects in 2010. France Telecom received funding for its M\_Stadium project, which uses mobile phones as paper-free tickets. The French national railway also received funding for its Proximités service, which features ge positioning, NFC and RFID (radio frequency identification) technology as part of a range of services for tourism, travel and disabled people.

In Singapore, a market with a strong track record of innovation in telecoms, a tender has been issued to build

a nationwide NFC mobile payment platform backed by a trusted service manager. Attached to the tender are commitments – such as the offer to host at least four different payment service providers 20 months from launch – designed to create an open and scalable environment.

Instances of direct funding can help build scale credentials into NFC services, since many trials so far have been local. The market is also encouraged by the public sector, as it is a leading customer of mobile contactless solutions. Articulating service benefits to end users is also an area where government support can add credibility.

State backing can play a role in incentivizing different parts of the value chain. UK figures show that accepting payment by debit card costs a retailer four times more than when



customers use cash.<sup>15</sup> Governments may have to address such merchant concerns – otherwise, take-up of mobile payment could be hindered if high debit card charging regimes are translated into emerging contactless payment solutions.

Retailers need greater incentives and consumers need new types of protection. In the US, Consumers Union, publisher of *Consumer Reports*, has called on the Government to tackle the risk of fraud. It has highlighted the fragmented nature of existing safeguards and has suggested that mobile payment providers give voluntary “zero liability” assurance to consumers without loopholes. In the UK, the Government has been working with mobile operators and card issuers on a set of guidelines that aims to prevent criminal activity in NFC. They include ensuring contactless payment

functions and phones are disabled as soon as a phone is reported lost or stolen, plus extra levels of verification for transactions above a certain amount.

In emerging markets, overseas government agencies also have a role to play, with both the United States Agency for International Development (USAID) and the UK Department for International Development (DFID) directly funding mobile money projects in recent years.

### Long-term success requires regulatory certainty

Many early successes in mobile money transfer services have occurred due to an absence of regulation. For example, Kenya’s M-PESA service was supported by a lack of rules around the status of

non-banks providing money transfer. Going forward, regulation will be a key facilitator of a successful transition to new payment channels, providing clarity for service providers and end users.

However, clear policy roadmaps are complicated by competing regulatory concerns. Following the financial crisis, greater stability is an imperative for banking regulators, yet a fast-growing mobile channel for remittances in countries with a lack of banking infrastructure brings challenges in terms of customer protection and regulatory oversight. In this light, demands for greater financial stability and greater financial inclusion could work against each other.

The need for openness to allow mobile payment to flourish must be balanced against security for payment providers and end users.

<sup>15</sup>“Government must stop banks overcharging shops and customers,” British Retail Consortium, 15 June 2010.

For example, the Principles for Innovative Financial Inclusion issued by the G20 Financial Inclusion Experts Group advocate a “test and learn” approach. Many countries are taking steps to improve guidelines around e-money. China has voiced concerns that the move to e-money could accelerate inflation due to the increased velocity of transactions. Such anxiety has prompted increased regulatory oversight: the Government has begun by requesting e-money organizations to be registered. However, solutions to other issues, such as how to deal with the residual value of e-money and how to monitor it effectively, remain works in progress.<sup>16</sup>

Other markets are also firming up their e-money guidelines. The Philippines was one of the first to do so, laying down maximum monthly load limits and extending the stipulations of its Anti-Money Laundering (AML) Law accordingly in 2009.

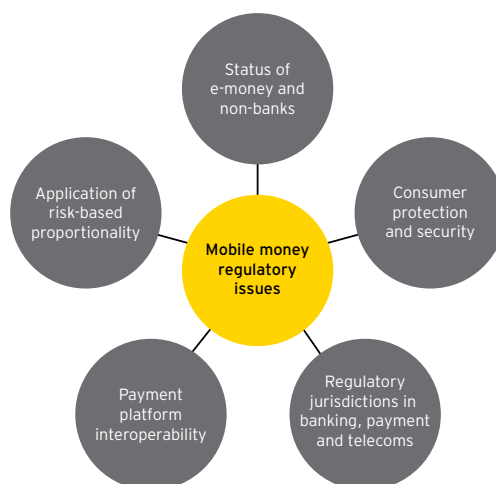
In the UK, HM Treasury has issued a consultation document on how it should regulate e-money institutions and what level of guarantees should apply. Efforts in the UK are notable for the explicit interest in promoting “the entry of mobile phone operators into the e-money market and to promote the development of new forms of as yet untested e-money services.”<sup>17</sup> At the other end of the spectrum are countries such as South Africa, where e-money issuance is restricted to banks only.

One key task for regulators will be to apply the principle of proportionality. This would mean that single-function products such as gift tokens would be exempt from the levels of oversight required of banks. E-money will occupy the space between exemption and the full regulatory burden placed on banks.

In this light, regulatory issues are likely to become complex. For example, telecoms regulators usually mandate that operators ensure competing networks are interconnected, but this is not the case for payment systems regulators. Virtual currency represents a unique challenge all of its own. As virtual currency issuers allow users to redeem it

with third-party vendors and offer full cash redemption – in short, becoming an accepted proxy for real-world money – so the regulatory burden can be expected to rise. For example, the gaming origins of virtual currency could also see more sophisticated use cases fall foul of lottery and gambling laws.

Figure 7: Regulatory issues in mobile money services



## The role of standards in innovation

Given that scalability is crucial to success in mobile payments, industry-wide standards have a key role to play. Pre-existing standards in the payments world can be repurposed for mobile money – EMV-compliant stickers for mobile phones, for example. In other areas, such as mobile contactless payments, standards such as the Single Wire Protocol (SWP) can accelerate adoption rates by the mobile industry.

<sup>16</sup>“Central Bank’s Ouyang Weimin speaks on the impact of electronic money,” China Europe International Business School, September 2009.

<sup>17</sup>“Electronic Money Directive consultation,” HM Treasury, 21 October 2010.

Mobile payment schemes are typically national in approach, but there remains a real need to coordinate new payment solutions at a regional level. For example, the Association Européenne Payez Mobile (AEPM) was set up in 2008 to develop Europe-wide specifications for contactless mobile payment. In December 2010, Mastercard and AEPM published interoperable specifications for mobile payment, that can work with Mastercard PayPass contactless terminals.

The GSM Association has also played an important role in driving new standards: a joint paper published with the European Payments Council (EPC) has helped define the provision and life cycle management of banks' mobile contactless payment applications into handsets.

## Cross-border conundrums

Cross-border payments lag behind in-market payments in terms of costs, convenience and security. The EU believes the cost of sending funds across borders represents 2%-3% of GDP and that this can be cut by better regulation. The Payment Services Directive (PSD) has been established to provide a single framework for payment standards and obligations, resulting in the Single European Payments Area (SEPA). As part of this, mobile channels for SEPA-based credit transfers are being assessed, which would help operators take a share of the regional remittance market.

However, progress has not been painless, with countries disputing the regulatory requirements to be imposed on non-banks, and many missing the first deadline for implementation. Such disagreements show the difficulties in translating national payments approaches into workable regional policy. At the same time, consumer groups are concerned that new EU payment rules could put end users at greater risk of fraud.

**Figure 8: Payment Services Directive timeline<sup>18</sup>**

Date	Milestone
Dec 05	European Commission proposal on a PSD
Nov 07	Adoption and publication of the PSD in the EU Official Journal
Nov 09	First deadline for the introduction of the SEPA instrument for direct debits
Nov 09	First deadline for the introduction of the SEPA in EU Member States
Nov 09	EPC and the Mobey Forum sign an agreement to support the take-up of mobile payments
Nov 09	Retailers and consumer groups give SEPA a cautious welcome
Mid 2010	Second deadline for the implementation of the PSD in EU Member States
Dec 10	Deadline for the replacement of current credit cards with SEPA-compliant cards
2013	Predicted new deadline for SEPA-compliant cards

For mobile operators, questions remain about their prospective status under the PSD. New definitions concerning payment institutions are set to co-exist alongside a different set of stipulations for e-money institutions, which may complicate measures to create equality.

Outside Europe, operators are taking a lead in providing cross-border payment capabilities. In July 2010, Korean operator SK Telecom signed a memorandum of understanding (MoU) with Japanese players KDDI and Softbank Mobile for cross-border contactless payment. In addition, there is a role for operators as wholesale facilitators of international mobile payments. Belgacom International Carrier Services provides a global hub service for international remittances.

<sup>18</sup>EurActiv.com

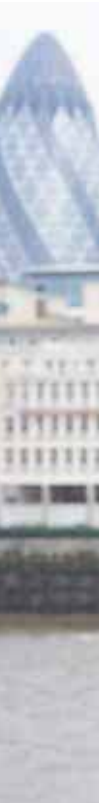
## Increased collaboration within and between sectors

Although business models for payment services remain fluid, the overall level of cooperation between the banking and telecommunications sectors is increasing. In China, an alliance has been struck between 18 Chinese banks, card association China UnionPay, China Telecom, China Unicom and device vendors, with a view to creating a single, open platform for mobile payments. In the Netherlands, the top three retail banks have formed a joint venture company with the country's three mobile network owners. Such high levels of participation translate into wider coverage of both mobile subscribers and bank customers, boosting the addressable market for mobile payment.

Even so, many partnerships remain defensive in nature, as banks, operators and card issuers pursue a range of solutions and use cases. Yet in markets where mobile money solutions have seen rapid take-up, operators have played a dominant role and partnership ecosystems have proved robust. In Japan, players from different sectors created a joint venture to develop mobile payment services, with NTT DoCoMo investing €73m to subsidize the purchase of contactless card readers by partner retailers. In Kenya, the use of agent networks played a pivotal role.

Merchant incentivization will be a key enabler for mobile contactless payments. At present, less than 12% of US merchants have POS readers that can accept contactless payments, for example.<sup>19</sup> Looking ahead, the rationale for upgraded infrastructure – reduced checkout time and new revenue streams – should be articulated by all players involved in the ecosystem. This is particularly true of card issuers, who are trialing mobile payment solutions and have long-standing relationships with merchants.

For mobile contactless solutions, support from device manufacturers is vital. In 2010, NFC-capable handsets accounted for only 960,000 handsets worldwide out of over one billion shipments.<sup>20</sup> Nevertheless, bulk handset shipments are predicted from 2011 onwards as key smartphone manufacturers start supporting the standard.



<sup>19</sup> "Mobile Payments: the battle for the mobile wallet," Credit Suisse, 19 November 2010.

<sup>20</sup> "Near-Field Communications: Playing tag," ABI Research via Total Telecom, 7 September 2010.



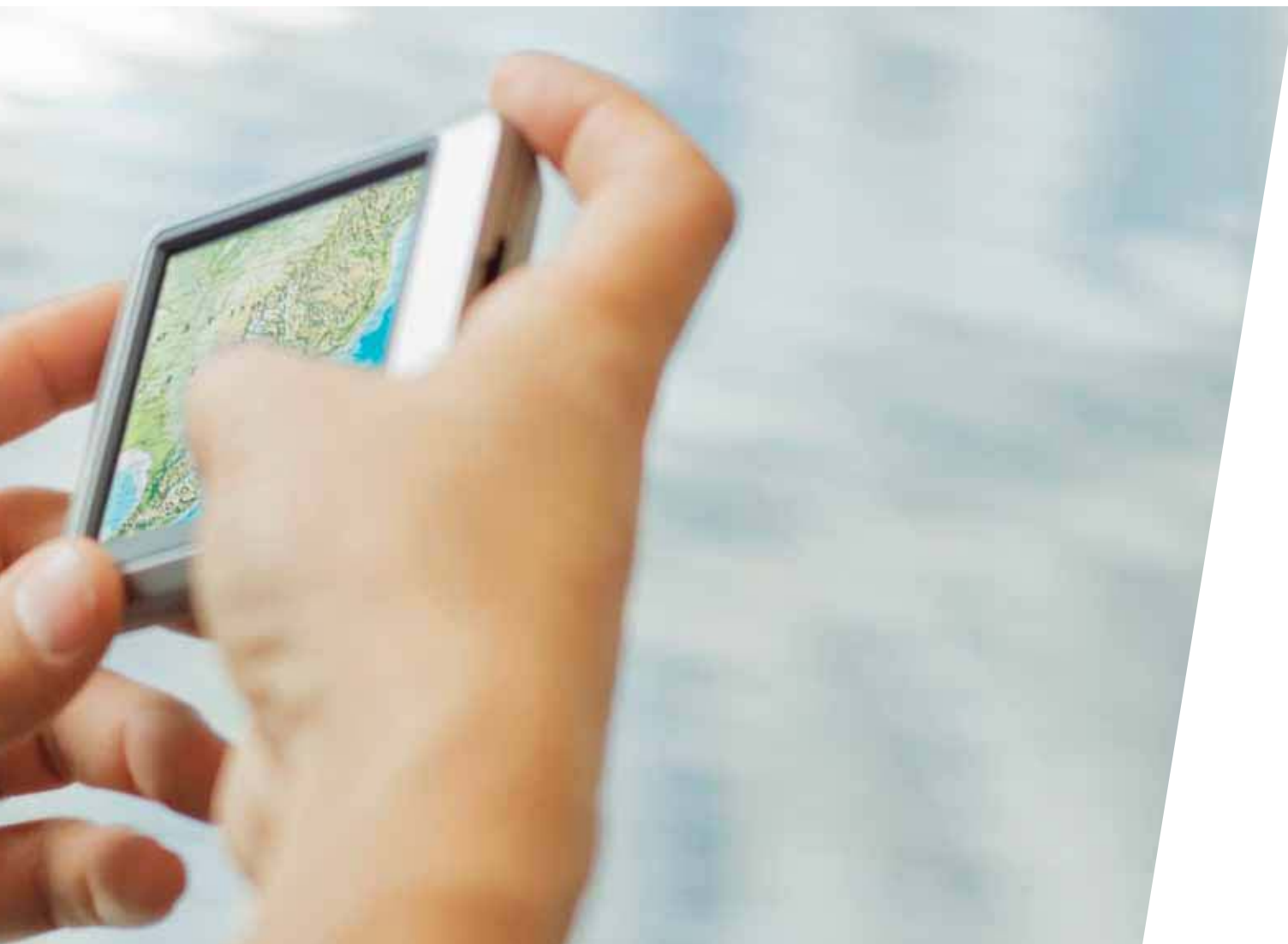
# 4.

# Mobile money – the road ahead

Mobile money will help drive the transformation of the payments landscape, accounting for a growing share of non-cash payments in years to come. The reach of mobile infrastructure coupled with the appeal of smartphones will help ensure that mobile can meet a range of customer needs, as innovation takes place on multiple fronts.

Technology cycles are shortening as payment solutions that transcend SMS appear: operators have to define the areas where they can add value, whether directly to the end user or as an intermediary elsewhere in the value chain.

For mobile payments to realize their potential, policy-makers have to take a range of steps. Facilitating service implementation and interoperability has to be prized as different payment systems continue to coexist. This is particularly vital because of mobile's dual status as both stand-alone and complementary payment channel.



As mobile payment scenarios expand and industry inter-relationships become more complex, shared challenges present themselves. The economics of the mobile payment business model require close attention from all parties – mobile operators, banks, card issuers and technology players – if scalable solutions are to gain traction. Energizing embryonic value chains while reassuring end users will require greater levels of collaboration between operators themselves as well as with partners in different sectors and geographies.

Engagement with a range of policy-makers - governments, central banks and regulators – can foster the right conditions for coordinated investment. Ultimately, flexibility – in terms of policy approach, customer proposition and stakeholder management – should be top of mind for all players as the handset catalyses a more efficient customer payments experience, and one that brings with it greater advantages in terms of information richness and location sensitivity.

# Glossary

**AML**

Anti-money laundering refers to the legal controls that require financial institutions to prevent or report money-laundering activities.

**CFT**

Combating the financing of terror refers to regulation that prevents the financing of terrorist activities.

**Contactless payments**

Contactless payments refers to transactions that are made by waving an RFID-enabled debit and credit card over a reader at the point of sale, resulting in reduced transaction time. Mobile contactless payments involve the use of NFC-enabled phones to perform the same function.

**e-money**

Electronic money refers to money that is stored on a device and which is only exchanged electronically, typically via the internet. Mobile payments are generally perceived as a subset of e-money. Other terms used to refer to e-money include e-currency, digital money and cybercash.

**EMV**

EMV is the standard backed by Europay, Mastercard and VISA International which ensures that their chip cards and chip card-based POS terminals and ATMs are interoperable.

**KYC**

Know your customer refers to due diligence and bank regulations that require companies to identify clients and secure relevant information pertinent to transactions.

**MicroSD**

Micro Secure Digital is a format for removable flash memory cards used in mobile handsets.

**NFC**

Near field communications is a short-range wireless technology derived from existing contactless identification technologies. Communication between NFC-compatible devices occurs when they are brought within four centimeters of each other. The short transmission range offers inherently high levels of security.

**POS**

Point of sale refers to the point at which goods and services are received in exchange for payment. The term is also used to describe systems and equipment that record financial transactions.

**Remittance**

Remittance in the broadest sense refers to payments made to a remote recipient. Often they refer to payments made between countries, such as a migrant worker sending money to relatives in another country.

**RFID**

Radio frequency identification refers to a technology that uses electronic tags on devices and wireless readers as an alternative to bar coding.

**RF-SIM**

Radio frequency-subscriber identity module is a proprietary Chinese wireless technology that provides short-range connectivity and which can be used as an alternative to NFC. However, it operates at a frequency which makes it incompatible with certain contactless payments systems.

**SWP**

Single Wire Protocol refers to a specification for a single-wire connection between the SIM card and an NFC chip on a mobile phone. It was initially approved as a standard in October 2007.

**USSD**

Unstructured Supplementary Service Data refers to a technology protocol built into the GSM mobile standard that allows information to be transmitted via the network and which can be used for a variety of applications, including mobile payment.

**WAP**

Wireless Application Protocol is an open specification compatible with most mobile network standards that allows specially formatted web content to be displayed on mobile handset screens.

# About Ernst & Young's Mobile Money Office

Mobile money remains one of the most significant trends for the telecommunications sector of the coming years. It is now delivering many new benefits for users around the world, and is shaking up the telecommunications, technology and financial services industries. All this is set to continue.

Ernst & Young's Mobile Money Office draws together our firm's experience in this field. Working with clients, our worldwide team of professionals is providing advice and support on strategy and planning, operations and performance, regulation, compliance and fraud, IT and risk management, tax and other financial assurance.

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#### About Ernst & Young

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