

Mobile payment

From Wikipedia, the free encyclopedia

(Redirected from Mobile phone micropayment)

Mobile payment, also referred to as mobile money, mobile money transfer, and mobile wallet generally refer to payment services operated under financial regulation and performed from or via a mobile device. Instead of paying with cash, check, or credit cards, a consumer can use a mobile phone to pay for a wide range of services and digital or hard goods. Although the concept of using non-coin-based currency systems has a long history,^[1] it is only recently that the technology to support such systems has become widely available.

Mobile payment is being adopted all over the world in different ways.^{[2][3]} Combined market for all types of mobile payments is expected to reach more than \$600B globally by 2013,^[4] which would be double the figure as of February, 2011,^[5] while mobile payment market for goods and services, excluding contactless NFC transactions and money transfers, is expected to exceed \$300B globally by 2013.^[6]

In developing countries mobile payment solutions have been deployed as a means of extending financial services to the community known as the "unbanked" or "underbanked," which is estimated to be as much as 50% of the world's adult population, according to Financial Access' 2009 Report "Half the World is Unbanked".^[7] These payment networks are often used for micropayments.^[8] The use of mobile payments in developing countries has attracted public and private funding by organizations such as the Bill and Melinda Gates Foundation, USAID and MercyCorps.

Contents

- 1 Models
- 2 SMS/USSD-based transactional payments
- 3 Direct mobile billing
- 4 Mobile web payments (WAP)
 - 4.1 Direct operator billing
 - 4.2 Credit card
 - 4.3 Online wallets
- 5 QR Code Payments
- 6 Contactless Near Field Communication
- 7 Cloud-based mobile payments
- 8 Audio signal-based payments
- 9 Direct carrier/bank co-operation
- 10 Mobile payment service provider model
- 11 See also
- 12 Notes
- 13 External links

Models

There are four primary models for mobile payments:^[*citation needed*]

- Premium SMS based transactional payments
- Direct Mobile Billing
- Mobile web payments (WAP)
- Contactless NFC (Near Field Communication)

Additionally there is a new emerging model from Haiti: direct carrier/bank co-operation.
[Citation needed]

Financial institutions and credit card companies^[9] as well as Internet companies such as Google^[10] and a number of mobile communication companies, such as mobile network operators and major telecommunications infrastructure such as w-HA from Orange and handset multinationals such as Ericsson^{[11][12]} have implemented mobile payment solutions.

SMS/USSD-based transactional payments

The consumer sends a payment request via an SMS text message or an USSD to a short code and a premium charge is applied to their phone bill or their online wallet. The merchant involved is informed of the payment success and can then release the paid for goods.

Since a trusted delivery address has typically not been given these goods are most frequently digital with the merchant replying using a Multimedia Messaging Service to deliver the purchased music, ringtones, wallpapers etc.

A Multimedia Messaging Service can also deliver barcodes which can then be scanned for confirmation of payment by a merchant. This is used as an electronic ticket for access to cinemas and events or to collect hard goods.

Transactional payments have been popular in Asia and Europe but are now being overtaken by other mobile payment methods,^[*citation needed*] such as mobile web payments (WAP), mobile payment client (Java ME, Android...) and Direct Mobile Billing.

Possible reasons include:^[*citation needed*]

1. *Poor reliability* - transactional payments can easily fail as messages get lost.
2. *Slow speed* - sending messages can be slow and it can take hours for a merchant to get receipt of payment. Consumers do not want to be kept waiting more than a few seconds.
3. *Security* - The SMS/USSD encryption ends in the radio interface, then the message is a plaintext.
4. *High cost* - There are many high costs associated with this method of payment. The cost of setting up short codes and paying for the delivery of media via a Multimedia Messaging Service and the resulting customer support costs to account for the number of messages that get lost or are delayed.

5. *Low payout rates* - operators also see high costs in running and supporting transactional payments which results in payout rates to the merchant being as low as 30%. Usually around 50%
6. *Low follow-on sales* - once the payment message has been sent and the goods received there is little else the consumer can do. It is difficult for them to remember where something was purchased or how to buy it again. This also makes it difficult to tell a friend.

Some mobile payment services accept "premium SMS payments." Here is the typical end user payment process:^[*citation needed*]

1. User sends SMS with keyword and unique number to a premium short code.
2. User receives a PIN (User billed via the short code on receipt of the PIN)
3. User uses PIN to access content or services.

Direct mobile billing

The consumer uses the mobile billing option during checkout at an e-commerce site—such as an online gaming site—to make a payment. After two-factor authentication involving a PIN and One-Time-Password (often abbreviated as *OTP*), the consumer's mobile account is charged for the purchase. It is a true alternative payment method that does not require the use of credit/debit cards or pre-registration at an online payment solution such as PayPal, thus bypassing banks and credit card companies altogether. This type of mobile payment method, which is extremely prevalent and popular in Asia, provides the following benefits:

1. *Security* - Two-factor authentication and a risk management engine prevents fraud.
2. *Convenience* - No pre-registration and no new mobile software is required.
3. *Easy* - It's just another option during the checkout process.
4. *Fast* - Most transactions are completed in less than 10 seconds.
5. *Proven* - 70% of all digital content purchased online in some parts of Asia uses the Direct Mobile Billing method^[13]

Mobile web payments (WAP)

The consumer uses web pages displayed or additional applications downloaded and installed on the mobile phone to make a payment. It uses WAP (Wireless Application Protocol) as underlying technology and thus inherits all the advantages and disadvantages of WAP. Benefits include:^[*citation needed*]

1. *Follow-on sales* where the mobile web payment can lead back to a store or to other goods the consumer may like. These pages have a URL and can be bookmarked making it easy to re-visit or share.
2. *High customer satisfaction* from quick and predictable payments
3. *Ease of use* from a familiar set of online payment pages

However, unless the mobile account is directly charged through a mobile network operator, the

use of a credit/debit card or pre-registration at online payment solution such as PayPal is still required just as in a desktop environment.

Mobile web payment methods are now being mandated by a number of mobile network operators.

Direct operator billing

Direct operator billing, also known as mobile content billing, WAP billing, and carrier billing, requires integration with the operator. It provides certain benefits:

1. the operators already have a billing relationship with the consumers, the payment will be added to their bill.
2. Provides instantaneous payment
3. Protect payment details and consumer identity
4. Better conversion rates
5. Reduced customer support costs *for merchants*

One drawback: the payout rate will be much lower than with other payment providers. Examples from a popular provider:

- 92% with Paypal
- 85 to 86% with Credit Card
- 45 to 91.7% with operator billing in the US, UK and some smaller European countries, but usually around 60%^[14]

More recently, Direct operator billing is being deployed in an in-app environment, where mobile application developers are taking advantage of the one-click payment option that Direct operator billing provides for monetising mobile applications. This is a logical alternative to credit card and Premium SMS billing.

In 2012, Ericsson and Western Union partnered to expand the direct operator billing market, making it possible for mobile operators to include Western Union Mobile Money Transfers as part of their mobile financial service offerings.^[15] Given the international reach of both companies, the partnership is meant to accelerate the interconnection between the m-commerce market and the existing financial world.^[16]

Credit card

A simple mobile web payment system can also include a credit card payment flow allowing a consumer to enter their card details to make purchases. This process is familiar but any entry of details on a mobile phone is known to reduce the success rate (conversion) of payments.

In addition, if the payment vendor can automatically and securely identify customers then card details can be recalled for future purchases turning credit card payments into simple single click-



Mobile payment system in Norway.

to-buy giving higher conversion rates for additional purchases.

Online wallets

Online companies like PayPal, Amazon Payments and Google Wallet also have mobile options.^[17]

Generally, this is the process:^[citation needed]

First payment:

- User registers, inputs their phone number, and the provider sends them an SMS with a PIN
- User enters the received PIN, authenticating the number
- User inputs their credit card info or another payment method if necessary (not necessary if the account has already been added) and validates payment

Subsequent payments:

- The user re enters their PIN to authenticate and validates payment

Requesting a PIN is known to lower the success rate (conversion) for payments. These systems can be integrated with directly or can be combined with operator and credit card payments through a unified mobile web payment platform.

QR Code Payments

QR Codes 2D barcode are square bar codes. QR codes are an easy way to inject info into mobile phone. This makes it easy to create communication such as visit a website or copy useful text. QR codes have been around since they were invented in 1994. Originally used to track products in warehouses, QR codes were designed to replace traditional (1D bar codes). Traditional bar codes just represent numbers, which can be looked up in a database and translated into something meaningful. QR, or “Quick Response” bar codes were designed to contain the meaningful info right in the bar code. They’ve been a successful marketing tool in Asia and Europe. In Germany a startup called GO4Q introduced mobile shopping / window shopping based on QR codes in October 2012. The system evolved and mobile payment was added by december 2012. GO4Q is using standard card payment procedures and thus not regionally limited. It requires a single registration. On business and consumer side, usage is possible with any smart device (IOS / Android). Since November 2012, QR code payments were deployed on a larger scale in the Czech Republic as an open format for a payment information exchange - a Short Payment Descriptor - was introduced and blessed by the Czech Banking Association as the official local solution for the QR payments.^[18] Due to technical limitations, the format is applicable only within the European Union.

Contactless Near Field Communication

Near Field Communication (NFC) is used mostly in paying for purchases made in physical

stores or transportation services. A consumer using a special mobile phone equipped with a smartcard waves his/her phone near a reader module. Most transactions do not require authentication, but some require authentication using PIN, before transaction is completed. The payment could be deducted from a pre-paid account or charged to a mobile or bank account directly.

Mobile payment method via NFC faces significant challenges for wide and fast adoption, due to lack of supporting infrastructure, complex ecosystem of stakeholders, and standards.^[19] Some phone manufacturers and banks, however, are enthusiastic. Ericsson and Aconite are examples of businesses that make it possible for banks to create consumer mobile payment applications that take advantage of NFC technology.^[20]

NFC vendors in Japan are closely related to mass-transit networks, like the Mobile Suica used on the JR East rail network. Osaifu-Keitai system, used for Mobile Suica and many others including Edy and nanaco, has become the *de facto* standard method for mobile payments in Japan. Its core technology, Mobile FeliCa IC, is partially owned by Sony, NTT DoCoMo and JR East. Mobile FeliCa utilize Sony's FeliCa technology, which itself is the de facto standard for contactless smart cards in the country.

Other NFC vendors mostly in Europe use contactless payment over mobile phones to pay for on- and off-street parking in specially demarcated areas. Parking wardens may enforce the parkings by license plate, transponder tags or barcode stickers. First conceptualized in the 1990s^[citation needed], the technology has seen commercial use in this century in both Scandinavia and Estonia. End users benefit from the convenience of being able to pay for parking from the comfort of their car with their mobile phone, and parking operators are not obliged to invest in either existing or new street-based parking infrastructures. Parking wardens maintain order in these systems by license plate, transponder tags or barcode stickers or they read a digital display in the same way as they read a pay and display receipt.

Other vendors use a combination of both NFC and a barcode on the mobile device for mobile payment, for example, Cimbalo or DigiMo,^[21] making this technique attractive at the point of sale because many mobile devices in the market do not yet support NFC.

Cloud-based mobile payments

Google, PayPal, GlobalPay and GoPago use a cloud-based approach to in-store mobile payment. The cloud based approach places the mobile payment provider in the middle of the transaction, which involves two separate steps. First, a cloud-linked payment method is selected and payment is authorized via NFC or an alternative method. During this step, the payment provider automatically covers the cost of the purchase with issuer linked funds. Second, in a separate transaction, the payment provider charges the purchaser's selected, cloud-linked account in a card-not-present environment to recoup its losses on the first transaction.^{[22][23][24]}

Audio signal-based payments

The audio channel of the mobile phone is another wireless interface that is used to make

payments. Several companies have created technology to use the acoustic features of cell phones to support mobile payments and other applications that are not chip-based. The technologies Near sound data transfer (NSDT), Data Over Voice and NFC 2.0 produce audio signatures that the microphone of the cell phone can pick up to enable electronic transactions.^[25]

Direct carrier/bank co-operation

In the T-Cash^[26] model the mobile phone and the phone carrier is the front end interface to the consumers. The consumer can purchase goods, transfer money to a peer, cash-out, and cash-in.^[27] A 'mini wallet' account can be opened as simply as entering *700# on the mobile phone,^[28] presumably by depositing money at a participating local merchant and the mobile phone number. Presumably other transactions are similarly accomplished by entering special codes and the phone number of the other party on the consumer's mobile phone.

Mobile payment service provider model

There are four potential mobile payment models:^[citation needed]

1. *Operator-Centric Model*: The mobile operator acts independently to deploy mobile payment service. The operator could provide an independent mobile wallet from the user mobile account(airtime). A large deployment of the Operator-Centric Model is severely challenged by the lack of connection to existing payment networks. Mobile network operator should handle the interfacing with the banking network to provide advanced mobile payment service in banked and under banked environment. Pilots using this model have been launched in emerging countries but they did not cover most of the mobile payment service use cases. Payments were limited to remittance and airtime top up.
2. *Bank-Centric Model*: A bank deploys mobile payment applications or devices to customers and ensures merchants have the required point-of-sale (POS) acceptance capability. Mobile network operator are used as a simple carrier, they bring their experience to provide Quality of service (QOS) assurance.
3. *Collaboration Model*: This model involves collaboration among banks, mobile operators and a trusted third party.
4. *Peer-to-Peer Model*: The mobile payment service provider acts independently from financial institutions and mobile network operators to provide mobile payment. For example the MHITS SMS payment service uses a peer-to-peer model.

See also

- Electronic money
- Financial cryptography
- Mobile Payment Using USSD
- Mobile ticketing
- SEMOPS
- SMS banking

Notes

1. ^ "Pre-1900 Utopian Visions of the 'Cashless Society'" (<http://mpra.ub.uni-muenchen.de/40780/>). MPRA. 2012.
2. ^ GSMA Mobile Money Deployment Tracker (<http://www.wirelessintelligence.com/mobile-money>) from wirelessintelligence.com
3. ^ "Japanese Drive Mobile Payment Market" (<http://www.ericsson.com/ericsson/corpinfo/publications/telecomreport/archive/2006/january/valista.shtml>). Ericsson.com. 2010-11-02. Retrieved 2011-09-19.
4. ^ "Total Mobile Payments to Grow Nearly Ten Fold by 2013" (<http://www.juniperresearch.com/shop/viewpressrelease.php?pr=106>). Juniper Research.
5. ^ "Research shows mobile phone payment double by 2013" (<http://www.bonsoni.com/blog/research-shows-mobile-phone-payment-double-by-2013/>). Bonsoni.com. 2011-07-24. Retrieved 2011-09-19.
6. ^ "Mobile Payment Transaction Values for Digital and Physical Goods to Exceed \$300bn Globally Within 5 Years" (<http://www.juniperresearch.com/shop/viewpressrelease.php?id=128&pr=97>). Juniper Research.
7. ^ "Half the World is Unbanked" ([http://financialaccess.org/sites/default/files/B25_Half_the_World_is_Unbanked\(2011-01-21\)-1.pdf](http://financialaccess.org/sites/default/files/B25_Half_the_World_is_Unbanked(2011-01-21)-1.pdf)). FinancialAccess.org. 2009.
8. ^ *Micro-payment systems and their application to mobile networks*, InfoDev report, Jan 2006 accessed at [1] (http://www.infodev.org/files/3014_file_infoDev.Report_m_Commerce_January.2006.pdf)
9. ^ "Stamatis Karnouskos, IEEE Communications Surveys & Tutorials, Vol. 6, No. 4, pp. 44–66, 2004." (http://diktio.dyndns.org/files/2004_COMSOC-SURVEYS.pdf) (PDF).
10. ^ Is Google Wallet the Next Step in Mobile Payments? (<http://www.reuters.com/article/2011/10/11/idUS303772297720111011>)
11. ^ "Ericsson launches mobile phone banking services" (<http://www.reuters.com/article/2011/02/02/ericsson-idUKLDE71128320110202>). Reuters.com. Retrieved 2012-12-16.
12. ^ "Ericsson Money Services brings connected mobile money to Europe" (http://www.ericsson.com/news/110608_money_244188810_c). Ericsson.com. Retrieved 2012-12-16.
13. ^ Feig, Nancy (2007-06-25). "Mobile Payments: Look to Korea" (http://www.banktech.com/blog/archives/2007/06/mobile_payments.html). Banktech.com. Retrieved 2011-09-19.
14. ^ "Payout rates from one of the major billing aggregator, Bango" (http://bango.com/mobilebilling/payment_network.aspx). Bango.com. Retrieved 2011-09-19.
15. ^ "Ericsson, Western Union partner to push mobile financial services" (<http://www.mobilepaymentstoday.com/article/191065/Ericsson-Western-Union-partner-to-push-mobile-financial-services>). *Mobile Payments Today*. February 28, 2012. Retrieved 2013-01-25.
16. ^ "Ericsson Teams with Western Union" (http://www.lightreading.com/document.asp?doc_id=218000). *Light Reading*. February 27, 2012. Retrieved 2013-01-25.
17. ^ "A smart, virtual wallet for in-store and online shopping – Google Wallet" (<http://www.google.com/wallet/>). Google.com. Retrieved 2012-12-16.
18. ^ "Standard No. 26: Format for exchanging the payment information for Czech domestic payments using the QR codes" (<https://www.czech-ba.cz/aktivity/standardy/format-pro-sdileni-platebnich-udaju-v-czk-qr-kody>). Czech Banking Association. 2012-11.
19. ^ "VDC: NFC Adoption Will Be Slower Than Expected" (<http://www.rfidjournal.com/article/view/6930>). RFID Journal. 2008-03-03. Retrieved 2011-09-19.
20. ^ "Ericsson and Aconite collaborate on mobile contactless payments" (<http://www.mobilepaymentstoday.com/article/195615/Ericsson-and-Aconite-collaborate-on-mobile-contactless-payments>). *Mobile Payments Today*. Retrieved 2013-01-25.
21. ^ "Digimo Group NFC Dual two phase commit". Nearfieldcommunicationsworld.com. 2010-10-15.

Unknown parameter |suc= ignored (help);

22. ^ Terrence O'Brien (August 1, 2012). "Google Wallet moves to the cloud, opens up to all credit and debit cards" (<http://www.engadget.com/2012/08/01/google-wallet-moves-to-the-cloud-opens-up-to-all-credit-and-deb/>). Engadget. Retrieved 2012-11-05.
23. ^ "Google has a Card up it's Sleeve" (<http://proteanpayment.org/?p=451>). November 5, 2012. Retrieved 2012-11-05.
24. ^ Kim, Ryan. "GoPago's line-skipping mobile payment system launches in San Francisco" (<http://gigaom.com/2012/04/03/gopagos-line-skipping-mobile-payment-system-launches-in-san-francisco/>). Gigaom. Retrieved 2012-11-09.
25. ^ "Audio Signal Mobile Payments and Loyalty" (<http://nilsonreport.com/issues/2011/985.htm>). nilsonreport.com. 2011-12. Retrieved 2012-07-09.
26. ^ T-Cash (<http://www.voilafoundation.com/t-cash.htm>) from VoilàFoundation.com
27. ^ "Testing out mobile money in Haiti" (<http://www.mercycorps.org/koko%C3%A9visossouvi/blog/22345>). MercyCorps. 2010-11-30. Retrieved 2011-09-19.
28. ^ <http://www.trilogy-international.com/TCashCommercialLaunchFinal.pdf>

External links

- *Dial 'M' for mobile payment*, National Computing Centre, UK (<http://www.ncc.co.uk/article/?articleref=113353>)
- "Mobile Payment: A journey through existing procedures and standardization initiatives" (http://diktio.dyndns.org/files/2004_COMSOC-SURVEYS.pdf), Stamatis Karnouskos, IEEE Communications Surveys & Tutorials, Vol. 6, No. 4, pp. 44–66, 2004.
- *The real digital divide*, *The Economist*, March 10, 2005 (http://www.economist.com/opinion/displayStory.cfm?story_id=3742817)
- What is a Mobile Payment? (Infographic) (<http://www.mobilepaymentstoday.com/infographic.php?id=2>)
- <http://mpira.ub.uni-muenchen.de/40780/>

Retrieved from "http://en.wikipedia.org/w/index.php?title=Mobile_payment&oldid=559907269"

Categories: Mobile payments | E-commerce | Payment systems | Mobile telecommunications

-
- This page was last modified on 14 June 2013 at 17:57.
 - Text is available under the Creative Commons Attribution-ShareAlike License; additional terms may apply. By using this site, you agree to the Terms of Use and Privacy Policy. Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc., a non-profit organization.