

# Apps help smartphones become digital wallets

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Wouldn't it be nice to forget your wallet - permanently? That day is coming sooner than you think. In the walletless future there will be no credit cards to lose, no cash to carry and no concert tickets to leave at home. Already, with a few taps on the screen of your smartphone, you can order a meal at a restaurant, loan your friend 20 bucks or even unlock the door to your house - so you can lose the keys, too.

Nearly half of U.S. consumers own smartphones, and as they have gained popularity the devices have grown to resemble pocket mini-malls, with rows of virtual storefronts where consumers can buy video games, music, books and TV shows.

It's becoming such big business that the largest banks and credit card firms are partnering with [wireless carriers](#), handset makers and eager [software developers](#) to push the [smartphone](#) further into the center of global commerce.

The plan is to turn your phone into a digital wallet that will let you pay for just about anything, whether you're online or at the register. By 2016, mobile payments are expected to reach \$617 billion worldwide, a nearly sixfold increase from last year's \$105 billion, according to research firm [Gartner Inc.](#) By then smartphones are expected to account for close to two-thirds of all U.S. mobile phones.

There are big advantages to [electronic money](#). It's easier and quicker to process than cash or plastic, and without the need to fish around for

credit cards or wait for receipts to print, long lines may become a thing of the past.

What that all tallies up to is that the way we buy and pay for things is in for the biggest change in decades - certainly since the rise of plastic cards in the 1950s, and perhaps since the emergence of personal checks a century earlier.

"We're going into a world where the consumer is going to be given lots and lots of different choices about how they pay, each with its own perks," said Carol Coye Benson, a partner at payment [consulting firm](#) Glenbrook Partners. "Cash and credit are the primary methods that everyone uses now, but it won't look like that in five years."

Although still embryonic, the world of smartphone payments is developing fast.

Since launching its mobile application last year, Starbucks has processed more than 45 million digital payments in 9,000 locations, and a recent visit to a store in Los Angeles showed why.

Morning coffee customers stood in line, nearly all of them tapping away at their smartphones, sending text messages, reading email or, in one case, playing a poker video game.

When Andy Deer's turn came to buy a pound of coffee beans, he opened his iPhone's Starbucks app and tapped "Touch to Pay." The phone flashed up a bar code, and the cashier scanned it. That was it - \$12 disappeared from Deer's Starbucks account, a receipt arrived in his email inbox and a cartoon star dropped into a cup on the phone's screen; two more and he would earn a free beverage.

"It's just a lot easier than carrying another card around," said Deer, a

37-year-old landscaper from Los Angeles.

Anytime the Starbucks app's balance falls below \$12, it automatically refills to \$25 by pulling from his credit card account. Deer's iPhone also has an app from Fandango that lets him buy movie tickets, and another from Amazon.com allows him to scan bar codes at a store such as Toys R Us - if Amazon sells the teddy bear for less, he can instantly order it through the Internet retailer.

"I'd be so hip to just having my fingerprint work for everything so I wouldn't have to carry anything else," he said.

The increasingly crowded field of companies looking to profit from digital payments also includes giants in the technology, payment and telecommunications industries.

Google Inc. last year introduced its Google Wallet smartphone app, which enables users to load their Visa or MasterCard number into their phone. The next version of Apple's iPhone will have a Passbook that will store customer loyalty cards and movie tickets, and Microsoft Corp.'s new phones will do the same.

PayPal is working to let customers at stores such as Home Depot and Foot Locker check out with only a phone number. And Isis, a consortium of Verizon Wireless, AT&T Inc. and T-Mobile, is working with Discover Financial Services to offer a mobile wallet to more than 200 million smartphone users.

"You can think of a zillion ideas about what we can do next," said Tam Hulusi, a vice president at Orange County's HID Global Corp., which along with payment services designs digital ID technology that allows people to enter buildings.

In a pilot program last August, HID installed digital locks around Arizona State University and gave students smartphones fitted with chips that would unlock the doors by waving the phones in front of them. Students agreed they were often likely to already have their phones in their hands when they came to a door, so they were saved the annoyance of digging out a key.

"We're basically bringing computing power down to personal objects, cars, airline seats, my radio," said Hulusi. "It's giving us a very secure way of communicating with machines of all kinds."

But as with many digital technologies, concerns about security will not be easy to alleviate.

Industry officials and analysts acknowledge that when a consumer makes a mobile payment, the money moves through more hands than it would with a cash or credit payment.

In addition to the smartphone manufacturer - Apple or Samsung, for example - the payment would also flow through payment applications and then through the phone's operating system - think Google's Android or Microsoft's Windows Phone system. Then the money would head on through payment firms such as Visa or PayPal on its way to plucking the money from your bank account.

"The more links in the chain, the more likely there's a weak one," said Sarah Jane Hughes, a law professor at Indiana University and a former attorney at the Federal Trade Commission's consumer protection bureau. "There's a greater possibility that somebody along the line doesn't have their security in good shape that day."

In February, a security researcher found a way to install software on a Google Android phone that broke into Google's Wallet app. If a thief

stole a person's phone, he could use the software to begin using the victim's credit cards, said Joshua Rubin, a senior engineer at Zvelo Inc., a Colorado technology and security firm. Worse yet, he said, if a smartphone owner had unwittingly installed a malicious application from the Internet, the attackers could use the weakness to look at the victim's payment history - if the owner had a record of making large purchases, the person might be a more attractive target for further hacking or identity theft.

"Mobile devices are an absolute gold mine for bad guys," Rubin said. "There's a reason why (ways to hack) mobile devices are commanding a huge premium on the black market right now."

A Google spokeswoman said that the company had fixed the hole that would have allowed an attacker to gain control of the phone, and that it was actively on the lookout for similar vulnerabilities. The company also noted that, as with credit cards, users should also contact their digital wallet provider if they lose their phone or suspect fraudulent activity.

Most observers agree that even with imperfect security, mobile wallets are far more secure than leather ones - lost cash rarely comes back and thieves can get away with using stolen credit cards at stores and online.

And unlike with wallets, consumers are likely to immediately notice if they've lost their phone. Payment industry officials also say that spotting fraudulent activity will be easier, given that the smartphone can provide its precise location, as well as more detailed information about the types of purchases the owner was likely to make.

The vision of a walletless future is also giving rise to the possibility of a cashless society, long the stuff of science fiction.

For one thing, cash can be burdensome to lower-wage earners who have

to pay regular fees to cash checks and use ATMs, said Dave Birch, a founder of payment advisor Consult Hyperion. Because smartphones now tend to cut across many income levels, [mobile payments](#) could level the monetary playing field.

Moreover, Birch said, with a smartphone people could begin to pay for things with any currency they choose - whether it is U.S. dollars, American Airlines miles, gold coins from the "World of Warcraft" video game, or even hours of electricity - a commodity that is very likely to hold its value over time.

Paper money, he said, "has worked well, but it's not appropriate for the next phase of evolution of the economy."

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## DIGITAL PAYMENT OPTIONS:

The growing crop of digital wallet offerings is making it easy to pay for a variety of everyday things with just a few phone taps. Smartphone applications usually email you an electronic receipt, so no more crumpled wads at the bottom of your purse or pocket. But watch out - once you start paying with your phone, it may be hard to go back to pen, paper and plastic.

-Stores and restaurants: Retail stores, coffeehouses and restaurants are increasingly getting wired to accept mobile phone payments. At Starbucks, customers can pay by tapping a downloaded app on the smartphone and then showing the device with the bar code that appears on the screen to the cashier.

The Square app lets users pay for meals at restaurants where it is accepted. When it's time to check out, tap on the Square icon, tag the

eatery and the clerk will see a photo of you pop up on the register's screen - the equivalent of asking for a photo ID. Once the bill appears on the smartphone, you just have to fill in how much tip you want to leave and tap to complete the transaction.

With PayDragon, you can order and pay for a burger or a sloppy Joe from a local food truck without even being there - when it's ready, you just walk to the pickup window and grab it.

More stores may soon accept so-called NFC technology to allow a customer to pay by waving his or her phone in front of a credit card terminal, although industry officials agree that it may take another year before many phones and stores are equipped with the technology to do this.

-Banking: Many online banks have smartphone apps that will let you check your balance and purchase history, as well as transfer funds between accounts. Apps from banks such as Chase and ING also allow customers to deposit funds by using a phone's camera to snap a picture of a personal check.

-Tickets: More movie theaters, sporting events and public transit systems are letting users buy and use tickets directly from their smartphones. The StubHub app lets you search for, buy and download sports tickets. Some teams, like the San Francisco Giants, allow fans to enter the stadium by flashing a bar code on their phones, to be scanned like regular tickets. Various subway systems around the U.S. have experimented with letting riders walk through turnstiles by waving their phones.

-Coupons and offers: Many of the newer [digital wallet](#) apps incorporate special coupons and offers. The Starbucks app keeps track of how many drinks you buy, and might offer you a free beverage after your 15th purchase. Google's Wallet app allows users to automatically redeem

offer coupons - say, half off a \$200 helicopter ride in Santa Ana, Calif.,  
- if that store's register accepts mobile phone payments.

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