Implementing a successful banking strategy

Are you prepared?

It all starts with TRUST

Five Reasons Why Every Bank Should Consider Using Digital Security Devices

1. Direct losses from online banking fraud are significant and widespread.
2. More security is needed as cyber criminals are becoming more sophisticated.
3. Moving transactions online increases bank profits but requires a higher level of trust.
4. It's easy to increase online security for high-value transactions for a relatively low investment.
5. Online trust is now a national priority in the U.S., and banks need to keep connections with clients positive by making online banking as convenient as possible.

What does a successful online banking strategy box look like?

1. Understand the changing landscape of banking
2. Understand and beware of the risks
3. Turn your plans into action
4. Choose the right solution path for your bank
5. Choose to integrate or outsource the task
6. Decide How to implement the new solution internally
7. Communicate the changes with your staff
8. Problem transport and deliver
9. Roll out, the new solution
10. Consider the future and your next steps

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We have your answers...

Summer 2011

Constantly connected

How the demand for instant access to data on the move is changing the mobile world

- The ePayment revolution
- LTE: the ultra-fast future of connectivity
- How smart meters and grids are transforming energy provision
- Why Londoners love contactless
This has been a tumultuous year in world affairs, and one of the most fascinating articles in this issue of *The Review* looks at the ever-growing role that digital technology is playing in the spread of democracy. (The feature starts on page 26.)

It’s a theme that resonates with us here at Gemalto, where everything we do starts with the individual. We focus on giving people the power — and the security — to do what they want to do, whether it’s supplying them with a bank card that gives them secure access to their money, a token that lets them authenticate themselves to a computer network or a SIM card that enables them to communicate using a variety of devices.

We’re also heavily involved in the world of machine-to-machine (M2M) modules, particularly since our acquisition of Cinterion last year. You’ll find Cinterion M2M modules in your burglar alarm, your car and may other places, and these mission-critical devices need to provide security and reliability. They also help us reduce our carbon footprint, particularly when applied to energy consumption. On page 34 we look at the global rollout of M2M-powered smart meters and grids.

Meanwhile, the addition of Todos and of Xiring’s banking arm to the Gemalto family has made us the world leader in electronic banking solutions. Today you can bank securely from home, without wasting time (or fuel) driving to your bank’s retail branch. On page 18, ePayments expert Dave Birch gives us his views on how the way in which we pay for things is going to change very soon.

In an issue that is themed around innovation, we also look at the next generation of mobile networks (page 12) and explain how the mysterious science of quantum entanglement could revolutionize communications (page 32). Whatever the future holds, you can be sure that Gemalto will be at the forefront of developments that contribute positively to people’s everyday lives across the globe.

Martin McCourt
Executive Vice-President, Strategy, Mergers and Acquisitions, Gemalto
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Grace Hopper devoted her life to making computing user-friendly

“In future, your emails will teleport to their destination”
The importance of universal internet access has been recognized at the very highest level in a report submitted to the United Nations Human Rights Council. The 'Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression' makes the case that internet access is a human right.

The report states that the internet has become an important medium upon which human expression occurs and raises concerns about cases where that expression is limited by the blocking or filtering of content, the criminalization of legitimate expression, cyber-attacks, and the disconnection of internet access.

Source: www.geek.com

Intel launches a chip for tablets

As the market for portable devices continues to evolve, technology companies have to evolve as well. The latest example is Intel, which has launched a new chip for tablet computers: the Intel Atom processor Z670.

Although Intel chips are in about 80% of the world’s laptops and desktop PCs, they have previously been criticized as being too power-hungry for smaller devices such as smartphones and tablets. Now, instead of pushing the processing speeds of chips to the limit, Intel is focusing on energy efficiency.

Source: www.physorg.com
BY THE NUMBERS

US$3bn
Mobile money (mMoney) services are an ever-growing source of revenue for mobile operators in Africa. A report from Pyramid Research predicts that they will make up more than 5% of total operator revenue across the continent in 2015, or about US$3 billion. Although there are now more than 40 mMoney services in Africa, they are concentrated in just 22 of its 54 countries, so there is plenty of room for growth.
Source: www.pyramidresearch.com

140 million
The number of tweets posted on Twitter every day – that’s more than a billion each week. Other statistics published to celebrate the microblogging site’s fifth birthday include the fact that an average of 460,000 new Twitter accounts are opened every day, and that the use of Twitter on mobiles has increased by 182% in the past year.
Source: techie-buzz.com

20%
New market forecasts from Juniper Research suggest that at least 20% of smartphones worldwide will have contactless Near-Field Communication (NFC) functionality by 2014 – a total of nearly 300 million phones. Mobile network operators launching services in 20 early-adopting countries before the end of 2012 will drive this growth in the short term.
Source: www.smartcardstrends.com

Mobile ticketing set to boom
A new report from Juniper Research predicts that the number of people worldwide using their mobile devices as travel tickets on trains, subways and buses will reach 500 million by 2015 – a fivefold increase over 2010. So far, mobile ticketing has caught on in Japan and a few European cities, but the report expects it to spread widely in China and Western Europe in particular.

Outside Japan, systems currently in operation typically use SMS messages or barcodes. However, the report’s author, Howard Wilcox, believes recent momentum in Near-Field Communication (NFC) will be a driving factor in market growth. As metro authorities begin the transition to contactless payment systems, he predicts that NFC ticket usage will grow significantly.

“We see convenience and choice for users as key advantages of mobile ticketing,” said Wilcox. “It will be 2013 before large numbers of NFC-enabled devices are in peoples’ pockets, and our report forecasts the impact [of that] on transaction volumes.”
Source: www.nfcnews.com

Cars get connected
Wi-Fi on the move is already becoming increasingly common as train stations and similar locations offer internet access to travelers. Now the next big growth area looks likely to be in-car Wi-Fi. Analysts say consumers are warming to the notion of more connectivity in their cars, so that they can use apps for information and entertainment similar to those they have on their smartphones and tablet computers.

According to market research firm iSuppli, 174,000 automotive Wi-Fi systems were shipped in 2010, but it expects this figure to rocket to 7.2 million by 2017.

Ford has been providing Wi-Fi in selected models since last year, and several other car manufacturers offer some kind of internet access, including Chrysler, Audi, BMW, Saab and General Motors.

For now, the main uses of in-car Wi-Fi are for entertainment and communication, but in future a range of apps are likely to be developed that will diagnose faults in the vehicle, allow it to be tracked if it is stolen, or even enable parents to monitor the speed at which their children drive when they borrow the car.
Source: www.physorg.com
Industry update

The contactless ATM is here

No one likes having to hang around at an ATM for too long, for obvious reasons. Now, La Caixa, Spain’s third largest financial institution, has launched cash machines that offer the fastest cash withdrawal system on the market. Equipped with contactless technology from Fujitsu, the ATMs enable customers to make cash withdrawals and perform other transactions by simply tapping their contactless credit or debit card against a reader and entering their PIN.

The first contactless ATMs were installed in Barcelona, Sitges and Palma, with the rollout scheduled to extend to other locations around Catalonia and the Balearic Islands soon. La Caixa also plans to widen the range of compatible services and functions on offer.

Source: www.contactlessnews.com

New cyberspace strategy launched

US President Barack Obama has unveiled a set of policy proposals for international cooperation aimed at ensuring an open and secure internet. In a 25-page document titled ‘International Strategy for Cyberspace’, the US government calls for strengthened diplomatic partnerships in which states and all those who recognize the “intrinsic value of an open, interoperable, secure, and reliable cyberspace” work together.

This marks a change in US policy: previous administrations have steered clear of any kind of internet regulation for fear of stifling innovation. But one of President Obama’s signature campaign promises was to protect the freedom of the internet, and this announcement represents a major step towards keeping that promise.

Source: www.whitehouse.gov/blog

Getting ready for IPv6

On 8 June, some of the world’s biggest online companies switched on IPv6 versions of their websites. World IPv6 day, as the trial was called, was partly a technical exercise to see how the technology works, and partly an awareness-raising initiative.

IPv6, which involves giving websites much longer IP (Internet Protocol) addresses, is being phased in because the world is running out of the shorter IPv4 addresses. IPv4 uses 12 digits, giving a maximum of 4.3 billion addresses, of which about 80 million are left to be allocated; IPv6 uses 32 characters, giving a maximum of 34 undecillion addresses. (An undecillion is 10 followed by 35 zeros in the British and American numbering system.) This additional capacity will be needed to cater for the growth of the ‘internet of things’ as more and more devices are connected to the net.

In the long term, companies and home users alike may need new networking equipment so that their computers can read IPv6 devices. However, the transition is likely to take several years, and customers of most internet service providers will receive IPv6-compatible equipment as part of the natural cycle of upgrades.

Source: www.bbc.co.uk/news/technology

What do you want?

What would you like to read about in future issues of The Review? If you have a good idea for a topic we should cover, go to the Gemalto blog at blog.gemalto.com, where we’ve started a thread about the magazine that you can reply to with your thoughts. We look forward to hearing from you.
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Content is king

Increased demand for instant, relevant data that users can access easily, wherever they are, has driven the development of applications (apps) and services in the mobile marketplace. The Review examines recent research that suggests how this continuous innovation is going to change the future.
Content. This innocuous word is the central point around which a technological evolution is taking place. Consumers devour data at an ever increasing rate and innovation is rushing to keep up – providing, disseminating, managing and securing it as effectively and seamlessly as possible. And the app has taken on an increasingly pivotal role.

According to a recent report by industry leading analytics specialist Zokem, 50% of all mobile data volume is taken up by native data applications such as social networking sites, multimedia and maps. “App stores, combined with a variety of non-browser-based data applications pre-embedded in today’s smartphones, are now driving the growth of the mobile internet,” says Dr Hannu Verkasalo, founder and CEO of Zokem.

An app explosion
While phones have had the ability to access the internet for several years, the current surge in popularity is the result of several factors merging in a receptive market. These include ease of use, the simplicity of purchasing and installing apps, the implementation of 4G with its additional bandwidth, the development of faster and more powerful devices, the growth of services that exploit these features, and the rise of Near-Field Communication (NFC).

The release of dual-core smartphones and more powerful tablets has coincided with an increase in the sophistication and availability of apps. Consumers increasingly use their phones for more than just talking or surfing the internet; as a result, social networking platforms, games and instant messaging clients are all driving the app market forward.

According to Zokem, social network users spend an average of 18 minutes a day on instant messaging, 11 on social networking apps and seven on games.

Purpose-built apps now offer users straightforward access to the content they want without any need to be technically proficient. The end-user buys a device for its accessibility options, its ergonomics, its access to an application store and its accessibility. In a time-poor economy, they don’t want to have to learn new skill sets. The shift toward a plug-and-play society is clear; apps, and the innovation that supports them, need to evolve to meet these demands.

Additionally, the development of machine-to-machine (M2M) communications means that data and connectivity are proliferating. This connectivity allows for the seamless development and integration of intelligent devices that can be implemented in cars, homes and industry. Meanwhile, the data can be used to develop more efficient apps and services.

A recent Forrester report points out that the rapid rise of app development has driven tech industry innovation, and that the second round of innovation will “leverage the intersection of cloud-based services; Smart Computing; and newly app- and internet-enabled devices like cars, appliances and entertainment systems”.

This ‘app internet’ will affect the way in which software is structured both on the economic and design fronts, as well as inspiring innovation and the development of

“Security solutions must ensure that mobile transactions are secure, engender trust and protect user privacy”
The rise of the app

The mobile app has transformed the way people use their phones. According to a March 2011 study by Zokem, the average smartphone user now spends more than 11 hours a month using apps, more than they spend on either web browsing or phone calls. According to a Zokem study commissioned by GSMA’s Wireless Intelligence, “mobile apps are responsible for 667 minutes of use per user each month”.

And yet, just a few years ago, the word ‘app’ meant nothing to the average consumer. On 11 July 2008, Apple launched its App Store, where 500 third-party applications were available: by 16 January 2009, 500 million apps had been downloaded, and the billionth landed on an Apple product on 23 April the same year. On 10 May 2011, Google announced that 4.5 billion apps had been downloaded from Android Market, and that 450,000 developers were building tools for Android devices.

Social networking apps such as Facebook and Skype sit at the top of the Most Downloaded lists of free apps for both Android and Apple, with productivity applications and games (notably the ubiquitous Angry Birds) coming in a close second in the paid app sector.

The rise of the app has also created opportunities for small companies and individuals who had no chance of getting products to consumers before. App developers have become entrepreneurs, and the barrier to entry is arguably one of the easiest to overcome in the technological world; developers need no specialist qualifications other than a bright idea and the ability to implement it.
Evolution of Security

As more services move into the cloud, and apps become increasingly prolific, security must evolve to match. We examined the security issues facing the cloud in ‘Securing the cloud’ (The Review, Autumn 2010) and identified Single Sign On authentication as a simple and elegant solution, offering a trusted layer of protection and control over the weakest link in the chain — the user.

The increase in the use of mobile phones has also seen an increase in mobile fraud, specifically within the arena of financial services. Security solutions have to ensure that mobile transactions are secure, that they engender trust and that they protect user privacy. According to recent research undertaken by Gemalto, consumer demand for an out-of-the-box experience, alongside demand for access to a viable app store, puts mobile operators under real pressure. When there are device or security issues relating to software or hardware, the operator takes the blame — and in developed countries, one minute of customer care time costs the equivalent of US$1. That cost can be minimized with the effective implementation of device management and security solutions.

The Web vs Apps

Websites designed specifically for easy access via mobile devices have been around for some time — but are they facing their demise, thanks to the app?

Not necessarily, according to Mark Showalter, Senior Director of Service Provider Marketing at US IT solutions company Extreme Networks. “Apps have limited flexibility, and power users will ultimately want to see more than an app can provide,” he argues.

Zokem’s May 2011 report states that “applications are clearly dominating the web browser both on smartphones and tablets when measured with face time… In smartphones the share of application usage is overwhelming — it achieves almost six times more face time than web browsing.” However, tablet users spend more time on web browsers than their smartphone counterparts, and most users across both platforms turn to their browsers for online searches.

Showalter adds that another major development is the rise of crowdsourcing, where ordinary citizens share information online for the common good. “In Japan [since the earthquake and tsunami], there has been crowdsourcing of Geiger counter data. They’re hooking their counters up to the internet to see how much radiation there is. The question is, how do we tie all this in to improve our lives and the efficiency of business?”

He believes that the spread of smart grids (see p34), along with mobile grids and applications that use crowdsourced data, could well be an inherent part of what’s to come.

A universal computing platform

A recent report by McKinsey examines another development: the next generation of HTML. A significant evolution in web standards, HTML5 allows programs to run through a web browser, making the browser the universal computing platform. Users can do anything from working to social networking to playing games, as well as accessing content stored in the cloud.

Both the mobile internet and the app could face stiff competition from this web-centricity, where a single application can be accessed from any device through a browser. Consumers only have to pay once and everything is accessible from any location and on any device. Perhaps viewing content on a browser will come full circle, or perhaps the app will evolve to render the browser obsolete. Either way, one thing is certain: content will remain king.

1 Applications Capture Already Half of Mobile Internet Traffic, September 2010
2 Mobile App Internet Recasts the Software and Services Landscape, by John C McCarthy with Christopher Mines, Pascal Matzke and Yaho Darashkevich, February 2011, updated March 2011
3 360-Degree Study on Tablets: Web Browser Gains Relatively More Face Time from Tablet Users, May 2011
4 How New Internet Standards Will Finally Deliver a Mobile Revolution, by Ben Korkmaz and Richard Lee, April 2011
The next generation of mobile networks will support ultra-fast multimedia and data applications. No wonder the technology is called Long Term Evolution.

4G is here – and it’s fast

Although second generation (2G) networks still account for the majority of the world’s mobile connections, the appetite for mobile data continues to grow exponentially. Today’s iPhones, Android devices and tablet PCs are more powerful than desktop PCs were five years ago, and they could not have existed without the infrastructure provided by third generation (3G) networks.

But the massive worldwide uptake of 3G merely whetted the appetite for even faster speeds. Imagine the possibilities if these devices could be connected to the internet at speeds of up to 100 gigabits per second (Gbps) – much faster than your home broadband. This is now becoming possible through fourth generation (4G) networking technology such as Long Term Evolution (LTE), which is starting to gain momentum around the world.

Like its 4G sibling WiMAX, LTE is an Internet Protocol (IP) based technology, which sets it apart from previous generations of mobile signaling. The designers of LTE re-engineered the way that multiplexing (dividing up the time and frequency parameters of a signal) is used, in order to pack more data across a connection. As a result, LTE currently achieves download speeds of up to 100 megabits per second (Mbps) and uplink speeds of more than 50Mbps. (Source: 4G Americas.)

Compare that with your home broadband service, which, if you’re lucky, gives you 10Mbps, and you can appreciate the quantum leap that LTE represents. Consumers will appreciate the difference when they see how well films, video conferences and presentations work on their future smartphones using LTE connections.

A global standard
“The new technology offers the promise of being the first truly global wireless standard,” says Dan Warren, Director of Technology at the GSMA, which represents the interests of mobile operators worldwide.

LTE takes advantage of the scalability of internet architectures and combines it with the security of the GSM family of networks based on smart cards. Its IP framework gives it significantly higher capacity, which in turn offers economies of scale. This capacity means that LTE will support voice, video, text, web, email and gaming to the same standard as, if not better than, a cabled network. It also creates the potential for more location-based services and presence applications that take advantage of the user’s mobility.

The significance of this becomes clear when you consider that mobile broadband subscribers will grow by 1,000% by 2014 and that there will be more than 2 billion mobile broadband users, generating annual revenues of US$137 billion. (Source: Ovum Research.)

The GSMA expects LTE to improve the user’s experience of video calling services such as Skype.

“LTE offers instant access to every app you could possibly need”
Gemalto at the forefront

Gemalto is leading the way in several commercial LTE deployments and through its work with the LTE Work Group in the SIMalliance. It is helping mobile network operators such as NTT DOCOMO in Japan and Verizon Wireless in the US deploy new value-added services using ultra-high-speed data access and IP connectivity.

Its LTE solutions include the LTE Full-IP Over-The-Air platform, which enables operators to instantly activate the end-user’s subscriptions, manage user rights and securely deliver a reliable data connection over their LTE network. Meanwhile, the LTE Universal Integrated Circuit Card (UICC) provides the reassurance of business continuity with state-of-the-art security and connectivity.

Gemalto won two Informa LTE Awards at the LTE World Summit 2011, for ‘Best contribution to LTE standards’ and ‘Best enabling technology’.

Whether that makes the operators the new kings of content or just mobile advertisers is a moot point. Many predict that the major players in the digital world — the likes of Google, Facebook and Amazon — will be the real kings of content and the mobile operators their servants.

But no single company can drive this market on its own. Initiatives already in progress are galvanising stakeholders into creating and securing the necessary infrastructure. For example, Gemalto is helping to secure Japan’s first commercial LTE rollout in partnership with NTT DOCOMO, which trialed a prototype 4G system as long ago as 2007.

Over the next few years, collaborations such as this will help to create ultra-high-speed networks that will make even 3G look snail-like by comparison.
When academics refer to dematerialization, they’re talking about reducing the need to create a physical product, and the energy savings associated with not having to transport that product. Thus, dematerialization can be anything from telecommuting to replacing your newspaper subscription with one for the equivalent iPad app.

Strictly speaking, replacing paper with smart cards doesn’t entirely get rid of the physical product, but a microchip is so small, and so powerful, that it may as well do. A plastic card with an embedded microchip can carry much more information in a smaller space than the equivalent paper document. It is harder to counterfeit and far more secure, as only authorized users can access the data it contains.

Smart cards have already taken on a central role in banking, but there are several other fields where they are contributing to dematerialization. For example, eDriver’s licenses can store everything from the holder’s picture and fingerprints to the history of their driving offences, while ePassports are harder to counterfeit than traditional ones and link the document more strongly to its owner, for greater all-around security.

As well as delivering security and convenience, implementing these electronic documents provides administrative efficiency and greater transparency for the authorities. In France, for example, the government has implemented three programs that show the value of paperless procedures: online income tax returns; the development of ‘télé TVA’, where companies can record and pay VAT/sales tax over the internet; and the SESAM-Vitale health card.

Prior to the introduction of SESAM-Vitale in 1998, the French were generating nearly a billion medical expense claim forms annually — forms that not only had to be printed, but also transported, manually processed and stored. The Vitale card contains administrative information that is necessary for the refunding of medical expenses, but no actual medical information, and provides proof that the cardholder is covered by the French health system. (In France, you normally have to pay when you visit a doctor, and the state and/or a health insurance provider then reimburses you.)

More than 1.1 billion medical expense claim forms were processed in this way in 2010 and the number continues to rise. This equates to an annual saving of €1.6 billion — and three billion sheets of paper — and this success is perceived as progress in terms of sustainable development through the reduction in the size of the health system’s ‘carbon footprint’ (although a full assessment has not yet been carried out).

There are other benefits, too, in terms of a reduced need for the infrastructure to support document processing. Ten years ago, in the Val-de-Marne (Paris) department alone, there were 41 payment centers; today there are just four.

For dematerialization to be effective, technology must do more than just replace paper; it must also improve the process and bring greater efficiency by simplifying administration while maintaining or improving security. The success of schemes such as SESAM-Vitale shows the potential for the smart card to transform our world.
India may have a rapidly growing economy, but 60% of its population is unbanked and scattered across rural areas where it simply isn’t commercially viable to build bank branches. It is these people that Financial Inclusion Network & Operations (FINO) serves.

Founded in 2006, FINO brings banking and insurance services to almost 32 million people in 309 districts. It does so through its network of 20,000 ‘bandhus’, or field agents, as Rishi Gupta, the company’s Chief Financial Officer, explains. “We provide an extension of the banks’ brick and mortar branches by having people on the ground,” he says. “We can provide financial inclusion without the customer having to travel all the way to a bank, which can be 50-100km from their village.”

The human touch is vital, of course, but FINO’s business is underpinned by the technology that enables it to deploy core banking solutions for banks, insurance companies and non-governmental organizations. These include deposits, loans, money transfers and remittances, mCommerce and utility services — everything from performing a saving transaction to buying a railway ticket to paying bills and insurance premiums.

FINO is a world leader in the field of financial inclusion, providing financial products and services to the unbanked in rural India. It uses Gemalto’s versatile banking card platform to deliver these services.

One of the biggest challenges for microbanking is the huge amount of paperwork and effort traditionally involved in supporting micro-transactions and in credit-scoring potential customers. High costs, coupled with low returns, initially hampered the growth of financial inclusion, which is why FINO wanted to find a ‘one-card-fits-all’ solution that would overcome these barriers.

This solution was developed by FINO, with whom Gemalto has been working for four years now, providing smart card technology to enable simplified, but secure, microbanking transactions. Each FINO card can securely hold up to 15 different types of independent applications that power services such as deposit remittances, savings, loans, insurance and ePurses. The card also acts as an electronic statement to log transactions, with the ability to store the last 150 transactions made. Fingerprint information is read using simple readers and then verified by the mobile card microcomputer — a valuable service for customers who can’t read or write.

Gupta adds: “Photographs are stored on the card’s chip and it becomes a passport, so nothing is needed in writing. This cuts costs, as well as removing the need for a fixed location for ATMs to receive and dispense cash.”

FINO is currently adding two million customers a month and has ambitious targets. It aims to increase its total number of customers to 50 million by 2012, by growing both geographically and in the number of services it offers to each customer through a single card. Given the company’s success to date, you wouldn’t bet against it meeting those targets.

“Each FINO card can securely hold up to 15 types of applications”
Need ID? You can trust your mobile

Consumers in Finland can now use their mobile phones to sign documents and authenticate themselves to secure websites, thanks to an innovative new technology platform.

Mobile authentication — using a mobile phone to identify yourself to a secure network — is gradually catching on around the world. It simplifies the lives of end-users and enables them to do all sorts of things, from signing documents to setting up a company, securely, using nothing but the phone in their pocket.

Finland is the latest country to introduce mobile authentication in a trusted network, thanks to a government-driven initiative that paved the way for the introduction of Wireless Public Key Infrastructure-based authentication for service providers requiring strong authentication and legally binding signatures. These include banks, insurance companies and municipal services, as well as eCommerce and social media websites.

As a result, the three major mobile network operators in Finland — Elisa, TeliaSonera and DNA — have launched a mobile authentication and signing service in a trust network. TeliaSonera and Elisa are using the technology and platform supplied by Valimo Wireless (a Gemalto company) for the service, which is be available on all phones, not just smartphones, as the application is built into the SIM card.

The advent of secure authentication enables operators to provide new and different types of services to their customers. For example, subscribers can use their mobile phone as ID when taking part in online discussion forums, or when applying for a bank account or insurance through a website, knowing that their personal information is secure at all times. They can also use it to make digital signatures, which have the same legal status as a written signature.

Mika Repo, Head of Business at Elisa, explains the benefits of the new platform: “The business model for three operators means that corporate customers only have to deal with one mobile phone operator and one technical interface,” he says. “It is very easy for corporate customers to get access to all mobile phone users who have mobile IDs, regardless of which operator is behind the service. The same goes for consumers. They can use their mobile certificates with their own operator, for any service.”

Elisa is currently looking at what kind of payment information can be included in the same message structure so that authentication, digital signing and payment can be carried out in a single transaction. This can then be linked to additional identification information such as address and payment history, giving unlimited possibilities for mobile authentication for a wide range of transactions and uses.

Repo believes that the opportunity to add more information to the authentication method opens up all kinds of possibilities for new applications. For example, the technology could be used to fill in online forms, or to enable someone to set up a new company online. The user will simply need a mobile phone number for identification purposes — all the information the website needs can then be taken from that.

The bottom line is that customers will no longer have to send off copies of their passport and driver’s license every time they want to open a new account with their bank, for example. It’s a powerful example of the way mobile technology can make life more convenient for the user.
We hope you are enjoying this issue of *The Review*. To help us make it even better, please take a few minutes to fill in our reader survey, which you can find at [review.gemalto.com](http://review.gemalto.com).

You can also subscribe to the magazine at the same location. Subscriptions are free and we deliver the magazine directly to you. The first 75 people to subscribe using the online form will receive a YuuWaa – the new digital storage solution from Gemalto, with 8GB of online storage and 2GB of flash drive storage, as well as a flash drive backup.

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[review.gemalto.com](http://review.gemalto.com)
The ePayment revolution

ePayment expert Dave Birch explains why he believes the mobile phone will revolutionize the way we pay for things — and why he hates cash

According to Dave Birch, within 10 years, half of all retail point-of-sale transactions in developed countries could be executed using mobile phones. Considering that the percentage is currently zero, it’s a bold claim.

But Birch has little doubt, largely because, to him, the mobile phone brings such an obvious improvement in convenience, efficiency and transaction costs. Cards will still be with us, but, he says, “I’ll be using a phone.”

Birch is a director at Consult Hyperion, a company that specializes in electronic transactions, and has assisted with the deployment of many electronic payment (ePayment) systems. You don’t have to talk to him for very long to realize that this man hates cash, and he’s happy to say why.

“Cash is too expensive,” he insists. “I live in a world that wants to make payments more efficient.” He adds that the costs of cash are largely hidden from the consumer: they’re in the infrastructure of people, machines and resources required to mint or print, count, transport, dispense and guard it. “The costs are distributed unfairly; the poorest people pay the biggest transaction costs. It’s a cross-subsidy from the honest (poor) to the dishonest (rich).”

Of course, many people will say they like cash, but “consumers will use electronic payments when it’s quicker, cheaper and more convenient to do so,” says Birch. “Right now, it isn’t. As McDonald’s goes contactless [in all of its 1,200 restaurants in the UK] over the next few months, that will persuade a lot of people.”

Another catering chain that is paving the way for wider acceptance of contactless payments is Starbucks. The coffee giant is letting customers pay for in-store purchases with their smartphones as part of a national program that is now available in 6,800 company-operated stores in the US.

Disruptive technology

Birch believes that the key disruptive technology in the field of payments is going to be the mobile phone. He isn’t put off by evidence to the contrary, such as a recent survey* that found that 70% of people in France are not interested in paying for things with mobile phones, pointing out that the public don’t always know what they want. “It’s like asking people 10 years ago if they wanted a solid-state music player [such as an iPod],” he says. “They’d have said they were happy with what they had.”

In the pilot projects Birch has been involved in — such as one for Transport for London, in which 500 people were given phones with Visa and Oyster functionality — the technology has worked well. “When consumers were given those phones with exotic new forms of payment in them and were told to tap the phone to buy coffee or pay for a ticket, they weren’t shocked. It’s as if people intuitively think that’s what phones are going to do. There’s something about the phone as a personal device that makes it easy for people to understand.”

So what is it that makes mobile phones so disruptive — and so practical — for payments? Birch explains that, unlike cards, phones can accept as well as make payments, just as, when it comes to identity and authentication, the phone can verify as well as demonstrate. In other words, it is symmetrical. It also makes role-based authentication possible: you can show you’re over 18 or verify your eligibility for a library card without divulging more information than you want.

“Something about the phone as a personal device makes it easy for people to understand”

interested in paying for things with mobile phones, pointing out that the public don’t always know what they want. “It’s like asking people 10 years ago if they wanted a solid-state music player [such as an iPod].”

The Review
phone,” he says. “The symmetry is quite disruptive. I don’t think people have taken on board the magnitude of the phone revolution.”

Does this mean the familiar payment card will disappear? Not any time soon, he says. Even in Japan and Korea, where mobile payments are established, most customers still opt for a traditional plastic card alongside their mobile virtual card.

**Security and trust**

All today’s payment models assume that a central third party will provide whatever security and trust are needed. This was something cryptographers hoped to replace as long ago as the early 1990s, when the public key cryptography software PGP was released. The idea was to create a web of trust by having people sign each other’s keys for verification.

Similarly, Birch believes, “the idea of trust becoming decentralized so that it’s something to do with networks” – that is, the social graph we build around ourselves on Facebook or eBay, for example – “rather than a rating agency is quite a plausible prediction. We thought it would happen because of PCs, but actually it will be mobile phones that make this happen. A lot of the ideas of the early 1990s were correct, but they needed mobiles to make them work.”

The other prediction Birch makes is that we will have a more diversified portfolio of currencies at our disposal in the future. Given an app to manage them, there’s no reason why our phones shouldn’t negotiate with a store’s point-of-sale terminal to agree on which currency to use for a transaction.

“If you wave the phone over their reader,” he says, “you could have a more sophisticated conversation, and it’s plausible that people will find other forms of value more appealing.” So you could end up paying in whatever currency the shop cares to take: euros, dollars... even Facebook credits, perhaps? The possibilities offered by the ePayment revolution are, in Birch’s view, endless.

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*Baromètre du paiement électronique, carried out by Ifop for Wincor Nixdorf, January 2011*
The success of London’s Oyster smart card for travel has helped to increase awareness and acceptance of contactless technology in the United Kingdom.
The UK market for contactless payment technology is expected to start taking off in earnest next year, just in time for the 2012 Olympic and Paralympic Games. If it grows as quickly as expected, much of the credit should go to a piece of plastic that has become a fundamental part of life for millions of Londoners: an electronic ticketing smart card called Oyster.

Transport for London (TfL), the local government body responsible for developing and managing transportation services in the capital, introduced the Oyster card in 2003. According to Shashi Verma, TfL’s Director of Fares and Ticketing, eight million people use it regularly, with more than 43 million cards having been issued in total. Oyster cards are now used to pay for 96% of all bus trips and 80% of train journeys, which has cut the number of paper tickets issued by two thirds and reduced lines drastically. “We’re trying to take the pain out of traveling,” says Verma.

Ted Bissell, mobile business expert at PA Consulting, suggests this high level of usage also means that, “almost accidentally, folks in London are quite familiar with contactless payment technology” because they are used to simply tapping a card against a reader before and after making a journey. “So there’s already a pretty large number of people who realize this technology doesn’t bite,” he says. “That’s significant, because if you’re starting from scratch, people can’t really conceive of what this kind of thing can do.”

A nationwide system
Nonetheless, the adoption of smart ticketing elsewhere in the country has been more limited. For example, while residents of cities such as Cardiff, Dundee, Bristol and Reading can all use contactless smart cards to pay for their bus journeys, other forms of transportation are currently not covered.

Movement is starting to occur in some areas, though. A smart ticketing initiative called NESTI, which is being led by local authorities in the north-east of England, is expected to roll out a multi-use smart card called the ‘Pop card’ next year, while the city of Nottingham in the Midlands anticipates following suit in 2014.

Meanwhile, the UK’s Under-Secretary of State for Transport, Norman Baker, has told his staff to bring forward the 2020 target date for the creation of a nationwide electronic travel ticketing system to “within a few years” in order to make access to

Right: the Oyster card has become an essential part of life for millions of Londoners – and in the process, it has got them used to contactless technology

43m
The total number of Oyster cards that have been issued to date
Below: a dedicated website enables Oyster users to manage their account online and top up their cards whenever they want.

public transportation easier and more cost-effective. But Verma is unsure whether such a deadline is achievable, pointing out that progress is only happening “in fits and bursts”.

Edward Hamilton, Senior Manager at telecoms, technology and media analyst firm Analysys Mason, is equally dubious that a national travel card will materialize any time soon. A key challenge, in his view, is the current lack of clarity over who would be prepared to fund such a project at a time when the government is making heavy spending cuts and transportation companies are not making huge profits.

Smart ticketing
Despite this controversy, TfL is pressing ahead with upgrading its smart ticketing system by adding support for contactless debit and credit cards issued by Visa, MasterCard and American Express. Although not ostensibly tied to next year’s Olympics, the move means that consumers will be able use plastic to pay a flat fare for travel on the capital’s 8,000 buses in time for the Games. Other forms of transportation, such as the London Underground and Overground networks, which operate a more complex pay-as-you-go model, are scheduled to follow suit by the end of 2012.

“The challenge of getting a new card and topping it up goes away entirely, so it’s a small, but significant, change in the way people use transport,” says Verma. “In the future, they won’t have to do anything special — it’ll be like any other transaction they do with a card.” He acknowledges that the upgrade will be a big job, however, because TfL has “more card readers than any bank or retailer anywhere in the world”.

Partly because of the success of Oyster, contactless cards are widespread in the UK. Gemalto has already supplied approximately 23 million proprietary contactless cards there, such as those used for transportation and physical access. In addition, it has issued more than 20 million dual interface EMV contactless cards to UK financial organizations.

Early adopters
So you won’t be surprised to hear that TfL is not the only organization in the UK intent on supporting contactless payment. About 52,700 card readers have now been installed at outlets around the country. Most belong to café or restaurant chains and convenience stores that have high traffic flows but deal mainly in low-value transactions, and their key aim in supporting the technology is to reduce lines and cut staff numbers.

Early adopters include fast food restaurant chain Little Chef, sandwich vendors Pret A Manger and EAT, health and beauty retailer Boots and supermarket chain Spar. As a result of these implementations, the number of contactless payments made through Barclays Bank systems alone has risen by 150% over the past year, to 1.7 million.

One reason that some merchants have been relatively slow to support contactless debit and credit cards is that many are waiting for the advent of mobile payment technology. The first wave of smartphones to support Near-Field
The 2012 Olympic and Paralympic Games are being viewed as an opportunity to showcase more than just sporting prowess to domestic and foreign visitors alike. For example, London’s Mayor, Boris Johnson, has pledged to spruce up the capital’s technology-friendly image by ensuring blanket WiFi support across the capital in time for the event, although it is currently unclear whether this will be free of charge.

TfL is playing its part by promising to introduce chargeable WiFi access at all Underground stations and bus stops by June 2012, following a successful trial at Charing Cross tube station.

Discussions are also taking place with mobile phone operators about the possibility of providing coverage at stations, but plans for both mobile and WiFi support in tunnel areas have fallen through.

London’s famous black taxicabs are also getting in on the act. A recently launched scheme will eventually give all 25,000 black cab drivers access to contactless payment technology. The solution will accept Chip and PIN and magstripe cards as well contactless, and will also feature value-added services such as mobile phone top-up.

At the Olympic Park, sponsors have guaranteed that visitors will be able to use mobile and contactless card technology to buy food and drink, as long as it is below the UK’s £15 transaction limit for contactless payments.

One sponsor, Visa, is also working with Samsung to develop an Olympics-branded, NFC-based mobile phone that includes a Visa-enabled SIM card and payment applications. For promotional purposes, the phone will be given free of charge to athletes sponsored by the two firms, but it will also be sold to consumers via retail outlets and mobile wireless carriers.

Meanwhile, Orange and Barclaycard have got together to provide mobile payment facilities to customers in time for the Games, while O2 likewise intends to launch a mobile wallet application as early as the second half of 2011. The wallet will comprise a suite of mobile payment options, including NFC-based contactless support and a shopping service to enable consumers to search for products and pay for physical goods. Individuals will also be able to transfer money to each other, and access phone top-up options that will be expanded over time to cover activities such as bill payment.

Communication (NFC) have been launched recently by many handset makers, including Samsung and Nokia, and these will progressively roll out during the remainder of this year.

Bissell believes that NFC will be widespread in the UK in two to three years’ time. “The general view is that plastic will come first and then mobile will dominate,” he says. Such a situation will come about because mobile payment technology opens up real revenue-generating opportunities to retailers beyond ‘tap-and-go’. It will enable them to offer customers potentially lucrative value-added services such as targeted loyalty coupons and special promotions as they shop.

What this ultimately means, says Dave Birch, Director at IT consultancy Consult Hyperion, is that “for many in this space, contactless is not a thing in its own right. It’s a step on the road to mobile payments. The mobile phone will be the real driver, as it’s the thing that changes the economics.”

But not everyone is so sure that mobile payments will take over the world. In the medium term at least, all of these forms of technology will probably coexist, because it is unlikely that a single solution will fit every consumer’s needs all of the time.

In the end, the consumer will decide which technology they prefer, and that will determine which prevails. What does seem certain is that the contactless journey that started with the Oyster card is far from over.
WIRELESS DATA TRANSMISSION...

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<thead>
<tr>
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Monitoring on the move
For millions of people suffering from conditions such as heart disease and diabetes, regular check-ups at a hospital or clinic are a way of life. But that is changing thanks to mobile healthcare devices using Machine-to-Machine (M2M) technology. Typically, the patient will be fitted with a discreet monitor that securely relays diagnostic data, such as their heart rate or blood sugar level, to the hospital. Physicians can view the data at any time from any location and alter the patient’s treatment accordingly – saving money and reducing the need for hospital visits.

The technology
Cinterion, a Gemalto company, produces a range of M2M-based medical devices. The Aera-CT, for example, is a lightweight and cost-effective heart arrhythmia monitoring device that will be commercially available in North America later this year. Designed for ease of use and comfort, the device is placed on the patient using as few as three electrodes.
The proportion of votes in the 2011 Estonian parliamentary election that were cast online

| 25% |

Digital democracy

New technologies can be powerful tools for improving democracy, but it’s not always that simple. The Review investigates how are they used most effectively — and whether they are always deployed for good.

The relationship between information and politics can be summed up by the fact that our words for gathering data and suppressing it are the same. The first duty that the censors of Ancient Rome had to fulfill was to maintain the population census; the second was to use that record to enforce public morality laws.

For the Roman censors, managing this relationship was straightforward. Today, new technologies and internet access undermine the ability of all but the most authoritarian regimes to control what their citizens read and say. Even in the poorest countries, online networks have become key tools for both protest and voter mobilization. From dissident groups in Iran to presidential hopefuls in Zambia, everyone is on Facebook.

Familiar as we are with the impact of digital technology on lifestyle and commerce, we are only just starting to understand its political challenges. In February this year, US Secretary of State Hillary Clinton spoke at the Internet Freedom conference to defend the rights of activists who use social media to hold their governments to account. As she was speaking, US government lawyers were appearing in court to subpoena the private Twitter account of an Icelandic MP because of her alleged links to the WikiLeaks organization. The irony was not lost on WikiLeaks supporters.

A complex relationship

Since 1997, the Hansard Society’s Digital Democracy program, based in the UK, has been exploring the complex relationship between the internet and government.

“If you look at the history of digital democracy, short though it is, there have been a couple of distinct phases,” says Program Director Dr Andy Williamson. “There was an early phase of everyone thinking that it was going to change everything, which was quickly put down. What you see now is that it supports what is already there. It allows new channels, but it doesn’t replace anything.”
“Facebook works well for bringing together traditional social networks with what sociologists call ‘weak ties’. Information starts filtering through.”

Those new channels have come to the fore in the idea of a “Twitter revolution”, a term that reporters used to describe recent revolts in Iran, Tunisia and Egypt. But there is a risk of oversimplifying the role that social media play in organizing such grassroots protests.

“Twitter is a very good tool for talking to the media, which is why 50% of tweets during the Egyptian revolt were in English,” Williamson explains. “If it were a tool for mobilizing Egyptians, the tweets would all have been in Arabic.”

He argues that Facebook was more significant than Twitter in creating a feeling of pan-Arabism across countries in North Africa. “People knew people who knew people who were connected via Facebook, and could see this starting to happen,” he says. “Facebook works well for bringing together traditional social networks with what sociologists call ‘weak ties’. Information starts filtering through.”

One of the less well-reported examples of technology supporting the campaign for democracy in Egypt was the fact that TV network Al Jazeera placed cameras around the protest camps in Tahrir Square and left them to stream live to the internet. In a country that is keen to be seen as more moderate than its neighbors, this paralyzed police reaction.

**Commercial considerations**

There is also a danger of seeing social networks as neutral platforms, rather than the commercial entities they are. To what extent do companies that have become conduits for political discourse have a duty to uphold people’s right to freedom of expression?

In the UK, Facebook was accused of ‘purging’ more than 50 accounts linked to anti-government activism on the morning of the wedding of Prince William and Kate Middleton. Meanwhile, BlackBerry, Skype and other communications companies have successfully fought off attempts by some governments to ban them because their encrypted services cannot be easily intercepted by intelligence services.

Tactical Technology is an international organization that teaches effective and safe communication for NGOs, civil rights advocates, lawyers and journalists based in repressive regimes. Executive Director Stephanie Hankey says that companies such as Facebook and Google have, by accident, become party to political activities. “Governments and companies are in a tight spot,” she says. “Neither are willing to take the steps that would be needed at the regulatory or social responsibility level to protect individual rights to freedom of expression, but there is no one else who can.”

Much of Tactical Technology’s work focuses on helping activists to manage their risk of exposure through digital ‘paper trails’. The organization also gives Sarah Palin to Hamid Karzai, is trying to emulate his ability to harness the web.

Obama’s online supporters did more than just click ‘Like’ on his Facebook page, however. From organizing speeches and visits to fact-checking Republican statements, millions of remote volunteers were mobilized and motivated through emails and videos.

While grassroots internet campaigning was essential to Obama’s election, one fact should not be overlooked. A massive number of small, sub-$100 donations raised half a billion dollars for the Obama campaign, allowing him to outspend Republican nominee John McCain on traditional media advertising by a factor of almost two.
independent support to democratic systems in countries that don’t have a good reputation for voter transparency. In Zimbabwe, for example, one of the tricks used to distort elections is to make it hard for people to find out where they are supposed to vote. To combat this, says Hankey, one of Tactical Technology’s partners gained access to the voter registration database and set up a cellphone system: “You could text a request with your name and address, and it would text you back telling you where your polling station was.”

**Online voting**

Fortunately, this kind of activity is not always left to a few committed activists. Digital tools are increasingly being used in a formal manner to improve the relationship between voters and the state in countries that do not have a strong record of democratic engagement (see panel, right).

The Baltic state of Estonia, formerly part of the Soviet Union, is among the few countries to have adopted online voting. Since its introduction in 2005, turnout in Estonian elections has increased, with one in four votes being cast online in the 2011 parliamentary ballot.

Tarvi Martens, Project Manager for Electronic Voting on the National Electoral Committee in Estonia, is cautious about inferring a relationship between online voting and turnout.

“We will say that they wouldn’t vote if there were no electronic voting, but we don’t know for sure,” he points out.

“We don’t know whether we are gaining new voters, but we do know that we aren’t losing the old ones.”

What he is sure of is that online voting in Estonia is convenient, cost-effective and secure. “Security at the server side is relatively easy,” he says. “The weakest link is the voter’s computer, which can be infected with trojans and so on. The great thing about eVoting is that it takes place over just seven days and is done through a client application, not a browser app. In order to attack that, you need to have it and crack it, and you can’t get it before the process begins.”

Proud as he is of Estonia’s record, Martens doesn’t think eVoting is suitable for every country. “Each cultural zone approaches privacy issues differently,” he says. “In the Nordics – which we consider ourselves part of – people tend to trust the government more than elsewhere.”

This, more than anything, is the key to understanding the new relationships between citizens and states that modern technologies throw up. Democracy is messy, chaotic and plural, and it is different in every single country. The best digital tools do not seek to impose order on it. That, for better or worse, is the job of the politicians.

**Ballots in Benin**

On the face of it, a sophisticated digital approach to the formal democratic process might seem suitable only for well-developed countries. Yet in the same way that the cellphone is helping the world’s poorest nations to leapfrog several stages of economic development, digital tools are being deployed to improve the quality of governance. In fact, there may be more scope for innovation in less well-developed nations.

Benin, in West Africa, is a relatively young democracy. After gaining independence from France in 1960, it was a communist dictatorship until 1989 and the first elections were not held until 1991. Since then, Benin has had a good reputation for free and fair elections compared with its neighbors, but has repeatedly had problems with contested counts and allegations of corruption.

In order to improve the accuracy and veracity of its democratic process for the 2011 presidential election, especially in the more remote areas of the country, the Beninese government began working with Gemalto in 2010 to digitize the electoral roll and introduce electronic voter registration.

As well as creating customized registration software that preserved the security of voters’ identities, the biggest challenge was to reach the approximately six million adults who are eligible to vote, 61% of whom live in rural areas. It took Gemalto less than two months to manufacture and provide government agencies with 3,215 mobile enrollment kits consisting of a laptop, a power supply and a small generator, and a further month to train electoral officials to use them.

These kits enabled officials to reach even the most remote communities with an efficient and secure tool for voter registration and compile the most authoritative electoral roll Benin has seen. Even so, the geographical challenge proved hard to overcome. The presidential election had to be delayed twice due to problems such as the registration process falling behind schedule, among other issues. Nevertheless, the final result – the re-election of President Boni Yayi – was agreed by observers from the African Union and the United Nations to be free and fair.
Global snapshot

3 million
More than 3 million transactions have taken place on Starbucks’ smartphone-based prepaid payments system, which only became available in all the company’s US company-owned stores in January. The Starbucks app, available free for iPhones and BlackBerrys, enables customers with prepaid Starbucks Card accounts to pay for items using the barcodes that the app displays on their phones.
Source: www.digitaltransactions.net

73%
Colombia ranks first in the latest global Security Index survey conducted by Unisys. The major concern is the risk of fraud when using credit or debit cards: 73% of Colombians interviewed said that they were “extremely concerned” or “very concerned” about personal data privacy and unauthorized access to this data.
Source: www.unisyssecurityindex.com

12.9bn
According to FEBRABAN (the Brazilian banking federation), almost one in four banking transactions made in Brazil in the past year was carried out using internet banking – a total of 12.9 billion transactions. That represents an increase of 27.4% on the previous year.
Source: www.febraban.org.br

13 million
Recent research by ON World reveals that 13 million advanced metering infrastructure (AMI) meters were shipped in North America in 2010, and that the market for smart meters is set to triple over the next decade.
Source: onworld.com
IE Market Research predicts that the number of mobile subscribers in Japan will rise to 127.6 million by the end of 2012, a market penetration of over 100%. About 40% of Japanese mobile users surf the internet on their phones, and smartphone sales are increasing.

Source: www.iemarketresearch.com

The French government has allocated €20 million to promote the adoption of Near-Field Communication (NFC) services. Technical specifications have now been adopted that will enable manufacturers to make interoperable, certified banking applications available, paving the way for a mass-market deployment. Four banks and four mobile network operators are committed to start rolling out commercial NFC services from early 2012.

Source: www.nearfieldcommunicationsworld.com

Turkcell and Garanti Bank have launched a new mobile payment system called Cep-T Paracard that aims to conduct TL500m (about US$310m) in transactions in the next three years. The system will enable customers to use their mobile phones for financial transactions, and they will also be able to earn bonuses and free calls when they shop with their bank card.

Source: www.hurriyeldailynews.com

Western Union has announced that consumers can now send money directly to the mobile wallets of Safaricom M-PESA subscribers in Kenya from 45 countries and territories. This is the first service of its kind in the world.

Source: www.westernunionmobile.com

In a survey, 71% of people in Indonesia who have access to the internet said they use it primarily for social networking. This is the highest proportion in the world: South Africa comes second in the table, with 50%.

Source: www.admadness.co

Western Union has announced that consumers can now send money directly to the mobile wallets of Safaricom M-PESA subscribers in Kenya from 45 countries and territories. This is the first service of its kind in the world.

Source: www.westernunionmobile.com

Image: Getty

Image: Getty

Image: Getty

Image: Getty

Image: Getty
The science of quantum entanglement may sound like something from a science fiction movie, but it could be on the point of delivering completely secure communication networks. *The Review* investigates

Quantum leap

Quantum physics is a complex name to describe a very basic concept. Everything around us is made of two things: matter or material – depending on whether you’re talking about a micro or macro scale – and energy (which is ‘contained’ or ‘restricted’ in the matter). So every ‘single’ thing is in fact two things, strongly correlated with each other.

Quantum computing exploits this concept of duality, whereby any action on one particle is instantly reflected on the ‘sister’ particle. In the world of computing, ordinary bits become qubits (quantum particles), and if you change one qubit, or even try to observe or measure it, the change is instantly reflected in the state of its pair.

In short, every ‘one’ is in fact ‘two’. In communication terms, this creates absolute security without the need for encryption... unless you have the ability to travel at the speed of light!
damaging the message or data that is being transmitted. This year has seen a massive leap forward, with a practical demonstration of a new switching device that uses quantum entanglement to generate and direct secure messages that can be transmitted over fiber-optic networks.

Prem Kumar, AT&T Professor of Information Technology in the McCormick School of Engineering and Applied Science at Northwestern University in the US, says: “My goal is to make a practical QC device. We work in fiber-optics so that, as QC matures, it can easily be integrated into the existing telecommunications infrastructure.”

The switching device itself is a major step toward a working QC network. The photons (light particles) that the switch uses demonstrate quantum entanglement. In practice, this means that two photons could be spatially separated by several thousand miles after a message is transmitted, yet the particles are still connected. This is called ‘superpositioning’ and forms the foundation of QC. So, if you encode a message using two qubits and transmit one to the message’s receiver, any change you make to one qubit will also be made to the other qubit instantaneously.

Nicolas Gisin, a researcher at the University of Geneva, says: “QC has two sides to it: basic science and applications. In basic science, one defines QC as the art of transferring a quantum state from one location to another, typically using the process named quantum teleportation.

“On the application side, QC is mostly about Quantum Key Distribution [QKD], and one typically sends pseudo-single photons [very weak laser pulses] directly from the emitter to the receiver, mostly using standard optical fibers from existing telecoms networks. Commercial systems exist and some are already in everyday use.”

Kumar adds that QC has a range of applications besides security, including quantum games and quantum auctions. “Symmetric private queries could be another big application,” he says, “where quantum entanglement allows a database to be queried without the database owner knowing what is being queried; the seeker only gets what they ask for and nothing else.”

Technical challenge
Additional technologies need to be perfected before QC can become a practical reality for everyone. One of these is the quantum repeater. This is needed to ensure that the transmitted quantum message arrives intact over very large distances, just as repeaters are used in the internet to ensure that each packet of data arrives at its destination undamaged.

This year has already seen two independent groups show demonstrations that clearly have a proof of concept with quantum repeaters. Because the quantum entanglement of each part of the communications process must be undisturbed, the development of a working repeater is vital if QC is ever to become viable. If this technology could be perfected, a quantum internet could be created where data could be transmitted instantly over vast distances with complete security.

Clearly, the components that will eventually lead to the practical use of QC are moving forward. For business, the benefits could be massive. “The major gain will be the possibility of producing cryptographic keys, testing their confidentiality and erasing them, all in real time,” says Gisin.

He goes on to explain how this will create genuinely permanent security. Currently, it is possible to store an encrypted communication and simply wait until you have the mechanism to decipher it, whether that takes years or even decades. “With QC this is impossible: any attack against QKD must be carried out in real time during the communication. There is no way to store information and then hope for future progress to help decipher it.”

The development of the quantum computer has so far eluded scientists, but the use of QC will become a reality once stable connections can be made over existing network connections, and once repeater technology has been perfected. For businesses and individuals alike, computing and communications will eventually inhabit the strange world of quantum mechanics. So in the future, your emails won’t simply be sent to their recipient: they will teleport to their destinations.”
The world is more connected than ever before, with 2 billion people now using the internet to interact in all sorts of ways. Yet in terms of overall connectivity, this is just the tip of the iceberg; the Machine-to-Machine (M2M) sector consists of billions of devices that communicate with one another autonomously, transmitting real-time data that can be processed and shared instantaneously.

The growth of M2M communications is revolutionizing a wide range of activities, helping to manage processes more efficiently and saving time and money. One of the most important of these applications is in the energy sector, where M2M brings the ability to monitor – and efficiently adapt – output in response to changing demand. Welcome to the world of smart meters.

The meter’s M2M module gathers data on energy usage and transmits it securely to the utility company over a wireless link, using a Machine Identification Module (MIM) to authenticate it.

Understanding energy usage
From the consumer’s point of view, this process has the immediate benefit of doing away with the estimated reading that caused so many billing disputes in the past. What’s more, smart meters allow them to better understand their gas, water and electricity consumption and then modify their behavior in order to both save money and reduce their home’s carbon footprint.

Meanwhile, smart meters allow the utility companies to better predict the needs of a given city, region or country, and so balance their energy generation or water consumption needs far more accurately. Linking together thousands of smart meters creates a smart grid that integrates the behavior and actions of all users connected to it in order to efficiently deliver sustainable, economic and secure electricity supplies. What’s more, as businesses and households start to generate their own electricity using wind and solar power, a smart grid enables them to sell their surplus energy back to the utility companies.

Limiting factors
The technology required for smart metering has been around for nearly 20 years, so it’s fair to ask why they aren’t yet universal. One answer is that there are millions of legacy meters in active use, and it costs money to replace them with smart meters. The question of who bears this cost – the user, the utility company or the government – is often hotly disputed, delaying deployment.

Moreover, until a raft of smart meters are deployed in a given area, the benefits of a smart grid – which include load balancing and energy efficiencies – will not be felt.

Rob Bamforth, principal analyst with business research firm Quocirca, adds that the enthusiasm for smart metering among energy suppliers is not universal — particularly those that supply large quantities to a single customer.
rural areas, where the costs of deployment are much higher. Without government regulation requiring energy suppliers to deploy the technology, there is a risk that only large urban areas may be covered.

“A classic case of this is cellular location technology,” he says. “Until the US government mandated that E911 services [which provide support for wireless phone users who call the emergency services] had to have access, nothing actually happened. With regulation in place, it happened — and quickly.”

This kind of government intervention has been crucial in Sweden, which was the very first country to launch smart metering pilot studies, back in 2001. A commercial rollout started in 2009 and has accelerated in the past year,

“Making energy smarter is in everyone’s interest”

following the government’s mandate to energy suppliers to provide monthly meter readings for customers. Add the fact that Swedish energy suppliers can no longer send bills based on estimated readings — and that the time allowed to correct billing errors has been reduced from 13 to just two months — and it’s no wonder that the energy companies are keen to complete their smart meter deployments as quickly as possible.

Revenue generation

There are more positive reasons for utilities to adopt smart metering, of course. In the US, the city of Sunnyside, Washington, recently raised its water billing rates by 6%, yet experienced a revenue decrease of US$120,000 in the following 12 months. The problem was traced to a fault on the meter of one of its major customers, whose bill had fallen from US$7,000 to just US$1,600 a month for the year in question. After investigating the problem with the commercial site’s large water meter, Sunnyside installed a smart meter on the site. The bills then returned to normal levels.

Following this experience, the utility changed its top 10 large meters to smart units, in order to guarantee accurate billing and easy testing. Sunnyside’s budget for its large meter testing program is just US$7,000 a year, but its newly efficient large meters are now generating an extra US$100,000 a year.

Smart meters, then, represent a win-win situation for utility companies and consumers alike. As IBM CEO Samuel J. Palmisano put it in a speech to the Gridwise Global Forum in September 2010: “Making energy smarter is in everyone’s interest. For a whole spate of reasons, the boldest action and the most pragmatic action are now one.”
In brief

Our innovation reaps rewards

Gemalto’s digital solutions have won a series of awards in recent years. The latest to be recognized is the Smart Badge Holder, which won the Sesames Award at CARTES in Asia 2011. This innovative product addresses the need for enterprises to give their workforces secure access to their data when they’re on the move. By inserting their corporate badge in the wireless Smart Badge Holder, the user can access their encrypted emails and sign documents electronically from their smartphone.

Gemalto has also been awarded the prestigious A.T. Kearney 2011 Best Innovator Award. The award recognizes innovation management and leadership and evaluates achievements in delivering innovative products and services.

North and South America

JustAskGemalto comes to Brazil

The website JustAskGemalto.com, already popular in the US, Europe and Asia as a place where people can go for expert advice as they buy, surf, communicate and travel, has launched a new version for Brazilian consumers, JustAskGemalto.com.br. There is also a Facebook fan page [JustAskGemalto Brasil] and a Twitter page (@JAG_Brasil), to help Brazilian consumers as they continue to embrace digital and social media.

40 million

Gemalto produces more than 40 million secure modules a year in Brazil, and the recent opening of a new production area for module assembly at its plant in Curitiba will enable it to continue to meet the growing demand for secure devices in the Brazilian market.

SVB moves to EMV

Financial institutions in the United States are finally recognizing the benefits of secure EMV chip payment cards – particularly those whose customers often travel outside the US, where the old magstripe cards are no longer universally accepted. One such institution is Silicon Valley Bank (SVB), which has chosen Gemalto to deliver EMV cards for its entire cardholder base, as well as expert advice on EMV migration, personalization and the delivery of the cards to the end-user.
Commuters in Stockholm are using the world’s first customized travel card after Stockholm Public Transport chose to deploy AllAboutMe, a turnkey solution to design customized cards online. People can order their card from home, and all issuance services are performed in Gemalto’s personalization center in Sweden to ensure they receive their card by mail within a few days. The new service has been a success, with an adoption rate of almost 50% for online buyers a month after the launch in February 2011.

Morocco is getting the message

Moroccan mobile operator INWI has already signed up almost 4 million subscribers since its launch in February 2010. To maintain that momentum, INWI has now rolled out LinqUs SIMessenger. Gemalto’s mobile instant messaging solution – the world’s first Microsoft-certified UICC-based application – enables users to keep in touch while they’re on the move, whatever handset they use.

Secure online banking in Ireland

Allied Irish Banks (AIB) is extending its online banking offering for customers, using Gemalto’s Ezio solution to provide additional security features. Gemalto is delivering the complete, future-proof Ezio solution, including strong authentication software, Ezio Club EMV card readers and consulting services. “Simplicity and convenience for our customers were determining factors in our selection of Gemalto’s solution,” said Diarmuid Hanrahan, AIB’s Head of Payments and eChannel Development.

5.5 million

Gemalto has already deployed more than 5.5 million next-generation secure electronic identity documents in Sweden. Now the Swedish National Police Board has renewed its five-year agreement with AB Svenska Pass (Gemalto’s operating company in Sweden) for travel documents. The contract also includes the launch of the European Residence Permit.

5.5 million

Long Term Evolution (LTE) technology is going to revolutionize mobile connectivity in the next few years (see p12), and Japan is leading the way. Mobile network operator NTT DOCOMO is deploying Gemalto’s LTE technology solution for Xi, Japan’s first wireless connectivity service based on LTE. The service covers the major urban centers of Tokyo, Nagoya and Osaka, with plans to reach 70% of the Japanese population by March 2015.

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Gemalto opens new office in Riyadh

On 24 May, Gemalto celebrated the opening of its new office in Riyadh, Saudi Arabia. Reflecting the broad scope of the company’s activities in the country, the ceremony was attended by government officials, corporate IT security leaders, and representatives of mobile operators and banks. The new office will boost Gemalto’s ability to support the region’s strategic growth and meet increasing market demand for digital security solutions.

It’s AllAboutMe in Stockholm

Commuters in Stockholm are using the world’s first customized travel card after Stockholm Public Transport chose to deploy AllAboutMe, a turnkey solution to design customized cards online. People can order their card from home, and all issuance services are performed in Gemalto’s personalization center in Sweden to ensure they receive their card by mail within a few days. The new service has been a success, with an adoption rate of almost 50% for online buyers a month after the launch in February 2011.
Amazing Grace

Grace Hopper was a pioneering programmer — and a dedicated Naval officer — who devoted her life to making computing more user-friendly

She was one of a kind: a key figure in the early decades of computing and one of the first women to become an officer in the US Navy. As if that weren’t enough, Grace Hopper is also credited with popularizing one of the best-known terms in computer programming.

Born Grace Murray in New York in 1906, she was part of the first generation of women in the US for whom further education was considered accessible. She was the first woman to gain a mathematics doctorate from Yale and accepted a teaching job at the prestigious Vassar College as soon as she completed her PhD.

World War II changed the course of her life. In 1943, she left both her job and her husband and joined the US Navy Reserve. Sent to the Harvard Computation Laboratory, Hopper worked on the Harvard Mark I computer, which was designed to solve wartime engineering problems and calculate solutions for warfare-related issues such as rocket trajectories. By pioneering ways to read and write code more effectively on the Mark I, Hopper became one of the first modern computer programmers.

After the war, she wanted to join the regular Navy but was told that, at 38, she was too old. Instead, she continued to serve in the Navy Reserve and took a permanent position at the laboratory, where she was responsible for showing businesses, military officials and scholars how they could use the latest computing techniques. In 1949, she moved to Philadelphia to work at the Eckert-Mauchly Computer Corporation (EMCC).

During this period, she wrote important papers on programming and computer design, proposing advances that allowed humans to communicate with computers in terms beyond ‘1’ and ‘0’. She was sowing the seeds of the field of ‘automatic programming’, which would become the basis of future high-level programming languages. She wanted to create programs that could be understood by more than just a few people, and at EMCC she drew graphical representations of code that explained the logic behind it, so that those who were less mathematically gifted could grasp how it worked.

It was also in the 1940s that she made her most famous contribution to the language. The story goes that her coworkers discovered a moth stuck in a relay, stopping it from operating. As they removed it, she remarked that they were “debugging” the system.

The catalyst behind COBOL, which used collaborative working methods spearheaded by Hopper, was the prototype for today’s open source technology.

In the late 1960s, Hopper was placed on the Navy’s retirement list, only a few years after she had stepped down from her duties at Remington Rand. But she wasn’t the retiring type. She was soon called up to the Navy again to help implement COBOL and was later named Director of the Navy Programming Languages Group. By the time she — involuntarily — retired in 1986, she had reached the rank of Rear Admiral.

The Digital Equipment Corporation immediately hired her as a consultant and she worked for them until her death in 1992, aged 85. Her main role during these final years was as a goodwill ambassador, lecturing on the early days of computers, her career, and what computer vendors could do to make life easier for users. Even though she was no longer a serving officer, she always wore her Navy full dress uniform to these lectures.

For someone so devoted to the service, it’s fitting that her name lives on in the Navy destroyer USS Hopper, launched in 1996 and nicknamed ‘Amazing Grace’.
State of Online Banking

The World Online Bankers

North America
97M
Europe
183M
Asia
165M
Latin America
91M
Africa
25M


Reality keeps changing and your online banking security solution will have to change along with it.

The Benefits of Secure Online Banking

15% 76%
Online banking customers are 15% more profitable and 76% more loyal.

80%
of online bankers say they want their banks to implement a strong form of ebanking security.

73%
of online bankers prefer interacting with their banks online rather than visiting a branch office.

25%
An online transaction costs the bank 25% of one conducted offline.

In 2011, online and mobile banking will take off...

US adult online bankers has risen from 51% to 58% (2005) (July 2010)*

US Mobile banking among online adults has doubled from 5% to 12% (2007) (2010)**

Multi channel banking is now common among US adults*

More than 2/3 of online banking was through one channel each year*

Within 3 in 10 use multiple channels monthly on average*

By 2015, 1 in 5 US adults will be using mobile banking*


What are your customers thinking?

Do you trust your bank to keep your information secure?

Yes, completely
19%

Yes, more or less
32%

No
15%

I don’t know
35%

Has your bank told you how they keep your information safe online?

Yes, plenty
34%

Yes, a little
27%

No
27%

I don’t know
23%

What are you most concerned about when banking online?

Identity Theft/Guarded Account
59%

Suspicious transactions
23%

Privacy, but I don’t always log in
23%

someone may have seen
12%

In addition, anyone using my computer
12%

How can you implement a successful banking strategy? View the back cover for more information.
Are you prepared?

It all starts with **TRUST**

**Five Reasons Why Every Bank Should Consider Using Digital Security Devices**

1. **Direct losses** from online banking fraud are significant and widespread.
2. **More security** is needed where cyber criminals are attacking – the oldest ID used for online banking.
3. **Moving transactions** online increases bank profits but requires a higher level of trust.
4. **It’s easy** to increase online security for high-value transactions for a relatively low investment.
5. **Online trust** is now a national priority in the U.S. and banks need to re-establish connection with clients, position banks as an identity broker, but only if they get identity authentication right.

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**Implementing a successful banking strategy**

**What does a successful online banking strategy look like?**

1. Understand the changing landscape of banking
2. Understand and identify the risks
3. Turn your vision into a project
4. Choose the right solution path for your bank
5. Decide how to integrate or replace the existing system
6. Communicate the changes with your customer
7. Protect the transport and deliver
8. Consider the future and your next steps
9. Roll out, the new solution
10. What does a successful online banking strategy look like?

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We have your answers...

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**Revie**

**Summer 2011**

**Constantly connected**

How the demand for instant access to data on the move is changing the mobile world

- The ePayment revolution
- LTE: the ultra-fast future of connectivity
- How smart meters and grids are transforming energy provision
- Why Londoners love contactless