Who is making travelers’ hearts beat faster?

Gemalto: the fastest* ePassport

Gemalto’s new Common Criteria certified Sealyss eTravel operating system:

- Speeds up border control with a reading time of less than 3 seconds*
- in Extended Access Control (EAC) mode
- Increases ePassport personalization throughput by leveraging record writing performance

Available on multiple interchangeable microprocessor platforms, the new Sealyss eTravel operating system secures your supply chain management.

Gemalto’s Sealyss eTravel operating systems are used in more than 25 national ePassport programs worldwide including Côte d’Ivoire, Denmark, Estonia, France, India (diplomatic), Korea, Norway, Malta, Morocco, Portugal, Qatar, Singapore, Sweden and the United States of America.

Now you know who’s making hearts beat faster.

* 2.6 seconds for a full EAC transaction with 48 KB of data, RSA 1024 and extended length (EAC tests in September 2009).

www.gemalto.com

The Middle East goes digital

From Masdar City to eGovernment solutions, this is a region on the move

- The car of the future
- Why companies can’t afford to neglect data security
- Ray Hammond on what’s next for electronic payments
- China moves to chip and PIN
Reputation is all

A series of highly publicized data breaches has focused the attention of governments and companies on the need for better security. To function effectively, they must gain the trust of citizens, shareholders and customers – and stronger authentication is key to building and maintaining this trust.

However, every organisation – whether governmental or corporate – has different needs when it comes to data security. ‘Manning the barricades’, on page 12, gives examples of the cost of data breaches to companies, both financially and in terms of reputation. The 24-hour news cycle is merciless, so it is crucial to invest in the products and services, as well as training and policies, that can stop breaches before they start.

Governments, too, are looking for ways to protect their citizens’ data as identification and other documents go digital. After the widespread deployment of passports and the first deployments of national eID projects, the market is now maturing – an example is the increasing use of secure eDocuments at border control. But, as with any new technology, the public needs to feel confident that their personal information is safe. On page 18, we look at how governments across the Middle East are implementing secure eGovernment solutions to make their citizens’ lives easier.

The bottom line is that there is no ‘one size fits all’ solution. Needs and priorities vary from country to country – and from company to company – and technology must be adaptable. Gemalto’s dedicated security team has developed a full portfolio of authentication solutions that will protect against hacking and other forms of data loss, and cater for all levels of risk and ability.

Elsewhere in the magazine, we look at the technology automakers are using to deliver the car of the future (page 26), examine how M2M and other smart solutions are helping companies to lessen their environmental footprints (page 48) and hear Ray Hammond’s take on what’s ahead for electronic payments (page 54).

Jacques Seneca
Executive Vice-President, Security Business Unit, Gemalto

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Virtual-security companies reap rewards

The global market for content-security gateways, firewalls, virtual private networks (VPNs) and other virtual security services more than doubled between 2009 and 2010 to reach US$429 million. That’s according to a report from Infonetics Research, which has also predicted that the virtual-security appliance market will grow to US$1.9 billion by 2015.

The growth of the market, which also includes products such as Secure Socket Layer (SSL) VPNs and intrusion detection and prevention (IDP) systems, is due to a number of developments in the world of corporate data security. One of these is the slow adoption of cloud technologies; companies like the cloud’s flexibility and ease of access, but need to be reassured about who has access to their data.

High-profile corporate data breaches, and the loss of reputation that can result from them, have also highlighted the critical importance of data security.

Source: cio.com

Multitasking T-shirt

Make some noise; charge your phone that was the message from Orange to revellers at the UK’s Glastonbury music festival. There, the telecoms giant unveiled a prototype T-shirt that uses noise-responsive technology to charge wearers’ mobile phones – handy when you’re living in a muddy field for four days.

A flexible piezoelectric panel on the T-shirt turns the vibrations from sound waves into small amounts of usable electricity; electrical generation from eight decibels – about as loud as a busy street – is about six watts.

Orange has a long-running tradition of introducing festival-goers to quirky ways of charging their mobile devices; past innovations have included pump chargers, solar panel pod tents, rubber boots and armbands that create a kinetic charge through dancing. But don’t get too excited: it is yet to be seen whether Orange will license any of these technologies for commercial use.

Source: web.orange.co.uk

EVENTS CALENDAR

<table>
<thead>
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<th>Event</th>
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<tr>
<td>7–10 Nov 2011</td>
<td>Association for Financial Professionals</td>
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How big can M2M get?

Machine-to-Machine (M2M) technology will be installed in more than 4.2 billion consumer electronic devices by 2020, according to a recent report from Machina Research. It expects the global M2M-connected consumer devices market to grow to €400 billion in the next decade.

The high growth potential of M2M, which allows devices to communicate with each other, is due to its reliance to a large number of sectors, including utilities, retail, healthcare and even agriculture. Applications range from smart energy meters to cars that communicate in order to avoid traffic jams and collisions (see our feature on page 32).

Source: machina-research.com, frost.com

New era for biometrics

The number of users of biometric technology in mobile phones is set to increase from 4 million to 39 million by 2015, according to analyst Goode Intelligence.

In a recent report on cellphone biometric security, it predicts that, in the next few years, growth will come from two technologies: embedded mobile technologies, such as fingerprint sensors; and third-factor authentication, or mobile biometrics used in conjunction with other authentication solutions.

The increase in biometric security comes in the wake of the growing market in mobile commerce, including Near-Field Communication (NFC); as smartphones hold greater amounts of personal and financial data, the need for security is increasing. Among cellphone manufacturers, Motorola is already using fingerprint-recognition technology, notable in its Aero smartphone, and the Siri ‘personal assistant’ in the recently released iPhone 4GS employs voice recognition technology.

Source: goodeintelligence.com

By the numbers

The number of countries expected to be using electronic identity (eID) cards by 2015, according to research company Acuant Company Intelligence. So far, 29 countries have implemented eIDs, including the BRIC economies (Brazil, Russia, India, China), large parts of Europe, the Gulf states and parts of Latin America. The number of national eIDs issued annually is forecast to grow 16% by 2015, from 424 million in 2010 to 655 million.

Source: acuity-mi.com

$670bn

The number of active users Twitter had on its books at the beginning of September 2011, a rise of 82% since 1 January 2011. Half of them log in every day and 55% of them are mobile users. The company expects that it will have added another 26 million active users by the end of 2011.

Source: blog.twitter.com

100 million

The total value of mobile payment transactions will triple to €770 billion by 2015, according to Juniper Research, and figures from Gartner indicate that the number of mobile-payment users is expected to surpass 141.1 million in 2011 – an increase of 38.2%.

Source: blog.twitter.com

By THE NUMBERS

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Looking at M2M-enabled devices across all sectors, the report estimates that the total number will be 12 million by 2020. It also says Europe will be the largest M2M market for consumer devices, with a share of 29%, followed by Asia Pacific (27%) and North America (21%). As the market for these devices grows, so will the need for security. Standards are converging (analyst Frost & Sullivan says that this could lead to hackers realizing their dream of ‘write once, run anywhere’), the stakes are getting higher and concerns over data security are growing; so security must be at the heart of the M2M industry.

Source: machina-research.com, frost.com
Google reveals its energy use

Technology giant Google generated 1.5 million metric tons of carbon emissions in 2010 – and uses enough electricity to power 200,000 homes at any one time. These figures, released in September 2011, represent the first time the company has gone public with this sort of information – perhaps because the numbers are so staggering. Google’s data centers alone use 240 million watts of electricity – the equivalent of a quarter of the output of a nuclear power plant – which comprises the vast bulk of its overall energy consumption. But the figures also take into account things such as lightning in its corporate parking lots and offices.

Despite the eye-watering figures, Google has used this opportunity to paint itself as an environmentally responsible business, it gives the example of someone using its search engine instead of driving to the library. It also designs and builds the majority of its data centers from scratch, allowing it to choose the most energy-efficient software and chips. Google’s openness about its energy use may herald a new trend. As our feature on page 28 shows, shareholders and the public are increasingly interested in how green a company is. We are already starting to see companies lining up to be open and honest about their carbon footprints – and shouting about how green they are.

Source: google.com/green

Banks rush to gain a foothold in mobile payments

Major banks around the world are working fast to develop mobile payment solutions to head off growing competition from non-traditional payment providers, according to business services firm KPMG. The 2011 Mobile Payments Outlook found that 84% of banking and financial services executives said that mobile payments will have “significant importance” to their business within the next four years, and 73% suggested that mobile payments would enter the mainstream within the same period. New players, such as online-payment specialists and online service provider giants, present a further threat to banks’ payment revenues.

Mitch Siegel of KPMG Financial Services, who co-wrote the report, was confident that banks will rise to the challenge. “We believe that if banks can roll out a safe, easy-to-use and universally accepted system, consumers will quickly adopt mobile-payment solutions as they have other mobile services,” he said.

The survey also indicated that technology standards and a lack of infrastructure are posing major obstacles to evolving alternative payment markets.

Source: kpmg.com
China eyes EMV future

The country has taken a giant step forward in the world of digital payment

“Everyone sees the potential, from banks to telecoms firms and transport operators”

China will have the most significant impact on the payment card market over the next five years,” says Phil McEachern, Research Analyst, AutoID and Smart Cards, at ABI.

The sheer size of the market attracts interest, and the introduction of smart cards further increases the desirability of the Chinese payment card market. And it will only grow in desirability.

The Chinese government will upgrade all national credit and debit cards from magnetic stripe technology to ‘chip and PIN’ by 2015. According to a recent report from ABI Research, China had an estimated 2.1 billion payment cards in use in 2010. The move by the People’s Bank of China to its PBOC 2.0 standard, which uses technology similar to EMV, is therefore a huge boost to the global smart card industry.

“China will have the most significant impact on the payment card market over the next five years,” says Phil McEachern, Research Analyst, AutoID and Smart Cards, at ABI.

“China’s payment card market is massive and potentially a self-sustaining market for any vendor. The sheer size of the market attracts interest, and the introduction of smart cards further increases the desirability of the Chinese payment card market.”

“At the end of next year, banks across China are making the rollout their top priority, supported by the government. Everyone sees the potential, from banks to telecoms firms and transport operators. “It will initially be costly for individual businesses to pay for the infrastructure necessary for migration,” Chan says. “However, the government is managing the process and is encouraging it by launching different projects across the country.” Although cash remains the most popular method of payment in China, the use of debit and credit cards continues to rise and there is an increasing emphasis on education and promotion. Debit cards are now well established and credit cards are growing in popularity, in spite of the slightly different set-up than that in many Western nations: credit card users in China are obliged to pay off the total amount they’ve borrowed within the first month. The move to upgrade credit and debit cards is still in its infancy, but many people in China are already familiar with smart card technology. A number of the country’s major cities already have their own travel cards, which users can charge with credit and use to pay for journeys on public transit. In Shanghai, for instance, the Public Transportation Card can be used to pay for trips in taxis and on buses, tourist buses, subway lines and ferries. They are also valid in some parking lots, gas stations and toll highways.

What has started small could make a very big splash indeed.

“China’s payment card market is massive and potentially a self-sustaining market for any vendor.”
Intesa Sanpaolo has launched an all-in-one visitor card to mark the country’s 150th anniversary.

Italy’s smart card for tourists

Intesa Sanpaolo’s product marks the latest step in the rapidly evolving tourist smart card market. Many US cities — from New York City to San Francisco — already boast their own cards, which give users discounted rates at a range of attractions, restaurants and shops.

In Spain, meanwhile, the Valencia Tourist Card combines unlimited access to the central zones of the city’s public transport network with offers in shops, restaurants and museums for a 24-, 48- or 72-hour period.

Namibian savings bank Nampost also offers a card, available through its 128 branches for 50 Namibian dollars (€4.80), that enables users to withdraw cash, rent cars and pay for fuel, accommodation and groceries.

As for future developments, a taste of things to come can be found in the UK, where communications network operator Orange and credit card provider Barclaycard have launched the Quick Tap scheme. It allows customers to make purchases up to the value of £15 by touching their Quick Tap-enabled smartphones against contactless payment terminals in participating outlets.

Quick Tap was launched in May 2011 and can be used at the 50,000 stores throughout the UK that accept contactless payments. Major handset manufacturers are expected to launch NFC-ready devices soon.

If Intesa Sanpaolo’s tourist smart card project proves popular, an essential part of any traveler’s pre-trip preparation may soon be to download the relevant app for their chosen destination, granting them immediate access to local public transit networks and an array of discounts and promotions.
Always connected
For all our virtues, humans are a flawed bunch. Name a mistake, big or small, and nine times out of 10 it was caused by human error. When it comes to corporate data security, the stakes are high — especially with more people working remotely. An unsecured laptop left absentmindedly in a public place can land a company with huge financial and reputational costs. Multi-factor authentication will go a long way toward securing sensitive personal and corporate data, but the education and the willingness of employees is crucial.

The technology
Gemalto’s Protiva range of software, solutions and services for enterprises, governments, banks and other institutions addresses all aspects of corporate data security, from encryption and multi-factor authentication to secure access to cloud computing and remote access to buildings and networks.
Global companies such as Sony and Citigroup are called ‘blue chips’ due to their reputation for quality and reliability. According to Kaspersky Lab’s International research, however, nine out of ten companies around the world admit to breaches by cyber intruders. This means that even the great and good are at risk of losing both money and reputation.

Data security can dent even a multinational’s finances. Ponemon Institute’s True Cost of Compliance report found that a data breach costs a blue-chip corporation an average of US$3.3 million for business disruption, US$2.4 million for productivity loss, US$2.2 million in lost revenue and US$41.4 million in fines and penalties.

But the problem for those responsible for defending against cyber intruders — the security department — is that they are generally working alone. Employees leave security to the experts, not realizing that defending the company’s digital assets should be a team effort.

It therefore falls to the security officer to marshal the company’s defenses. They should set and enforce security systems, and educate employees on the risks of a breach. This might motivate users for the second phase: helping to secure the firm’s assets against outside influences.

‘User-driven security’ is the psychological approach being used by governments and the private sector alike, according to Ed Rowlsey, Senior Product Manager at vendor M86 Security. By driving home the idea that data breaches could put their jobs at stake, and outlining the potential damage — loss of customers, loss of reputation, litigation, loss of shareholder value — employees will feel part of the security team.

Posters, articles in newsletters or on the intranet, and lunchtime training sessions are all methods that can be used to educate and raise awareness. But the key to a successful security policy is that it shouldn’t require much effort on the user’s part. “A successful security policy is one that is a business enabler rather than a business inhibitor,” says Rowlsey. “It is meant to make life easier.”

With cyber attacks becoming more common, all companies will need to adopt new structures, governance and processes to manage this threat, advises Mark Waghorne, Information Security Partner at KPMG. “Putting the right core of technology and processes first is vital,” he says. But where do you begin?

The first challenge for IT security teams is keeping one eye on the opposition, although this is difficult at best. Hackers move quickly and unpredictably, not only rewriting malware frequently but also testing and adjusting code in a process similar to that used by legitimate software developers. “Sometimes,
$70

The average cost of a password-reset call to the IT helpdesk

Companies in the Cloud

Many new technology launches, from the Titanic to passwords, have been initially hailed as infallible, only for subsequent events to prove otherwise. Cloud computing is no different — and providers are having to work hard to build a reputation for solid security. There have been a few early setbacks, however. In February 2009, the world’s biggest cloud service provider, Google, was forced to apologise to millions of Gmail users after routine maintenance at one of its data centers caused the service to collapse. Another of the giants of cloud services, Salesforce.com, suffered an embarrassing loss of reputation when a staff member was fooled into revealing his password during a phishing attack in 2007.

The central concepts underpinning cloud infrastructure are multi-tenancy and a decoupling of hardware resources and applications. Data can be stored in one place, while the processors that run the processing are still elsewhere. To make matters more complicated, cloud service providers usually work with a wide range of third parties, all of which may have access to users’ data.

Governments are no exception

In the US, the Office of Management and Budget (OMB) has instructed federal agencies to “ramp up” their use of Federal Personal Identity Verification (PIV). The aim is for these smart cards to be the only method of access to any federal agency’s facilities, networks and information systems. The Homeland Security Presidential Directive 12, issued by President George W. Bush in 2003, has led to a significant increase in the level of online identity assurance within the federal government. PIV cards have emerged as the best solution for US national security, and Gemalto is one of the vendors that have developed products and solutions to help US federal agencies comply with the stringent regulations. The endgame, according to the National Strategy for Trusted Identities in Cyberspace (NSTIC), is a cyber world it calls the ‘identity ecosystem’, which will improve on the password system of logging in by creating a range of security options.

The NSTIC strategy document said: “The security marketplace will allow people to choose among multiple identity providers — both private and public — that would issue trusted credentials that prove identity.”

The average cost of a password-reset call to the IT helpdesk

In the US, governments must ensure that every employee is aware of the risks, has a password, and can reset it easily. Analyst Forrester says that password resets comprise 50% of time-consuming to administer: analyst Forrester says that password resets comprise 50% of time-consuming to administer: analyst Forrester says that password resets comprise 50% of time-consuming to administer: analyst Forrester says that password resets comprise 50% of time-consuming to administer. Password resets are not only time-consuming, they are also expensive and easy to compromise. They’re also expensive and time-consuming to administer: analyst Forrester says that password resets comprise 50% of helpdesk calls, with each costing about $70.

Strong authentication uses two or more forms of identity verification. To access company servers or email, an employee may have to insert their smart card into a reader, then enter a PIN, and then perhaps scan a fingerprint. The more forms of identification, both physical and virtual, that are required, the safer the data is.

It also speeds things up: once authenticated, the employee’s access to specific categories of information can be automated, saving time down the line.

Different levels for different people

There are other benefits to a multi-factor approach. The first is that not every employee will need access to all levels of business data, so each person can be given an authentication method that suits their role and business needs. For example, the chief financial officer of a Fortune 500 company should be using a very strong authentication method when preparing his or her quarterly figures.

The second is that workforces are increasingly mobile: some travel frequently and others split their time between home and the office. According to a survey by Cisco, 31% of employees around the world now use more than one mobile device during a typical workday. This can leave their data vulnerable to theft or attack: how many times have we heard about laptops containing sensitive information being left in public places? In a recent example, US company Allstate Financial had to notify some of its clients in July that their data could have been compromised after an employee lost a laptop — and failed to report it for three weeks.

With a new breed of sophisticated, determined hackers who are often driven by political and ideological motives, cybersecurity will only become more prevalent. Instead of existing protection for systems is no longer enough to ward off attacks: hackers can easily overcome firewalls, passwords and anti-virus software and other security layers. Clearly, it’s time to man the barricades.

Companies in the Cloud

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The Middle East comprises 15 countries, depending on your source, and, like snowflakes, no two are alike. Making generalizations about the region is difficult, if not impossible, whether it’s the cultural traditions or terrain. The same is true of the region’s usage of digital technology, which ranges from basic to world leading. It’s no surprise, for example, that some of the less-developed countries have some way to go: of Iraq’s 30.4 million people, only 860,400 – just 2.8% – have access to the internet. In Yemen, there are 2.34 million web users among its 24.1 million inhabitants – a substantially better 9.7%.

But take into account more developed countries such as the United Arab Emirates (UAE) and Qatar, and the region as a whole compares well with the rest of the world. According to Internet World Stats, internet penetration across the Middle East’s 15 countries is 33.5%, compared with the global average of 30.1%.

Indeed, many countries in the region have their fingers firmly on the digital pulse. Lindsey McDonald, an ICT consultant for Frost & Sullivan in the Middle East and North Africa, says: “We’ve seen widespread implementation of eServices. Countries such as the UAE, Oman and Bahrain lead in this respect.”

M2M in the Middle East
Over the past decade or so, the UAE has worked hard to position itself as a modern, glamorous destination for businesses and tourists. Its emirates, notably Dubai and Abu Dhabi, are keen to be on the cutting edge of everything they do – and digital technology is no exception.

In 2008, in a bid to prove its green credentials and showcase its innovative technology, the primarily government-funded Abu Dhabi Future Energy Company broke ground on the world’s first zero-carbon, solar-powered city. Although Abu Dhabi holds about 9% of the world’s proven oil reserves and almost 5% of its natural gas, the aim of Masdar City is to advance the emirate’s renewable energy sector and reduce its reliance on hydrocarbons. It could well prove a trendsetter: the development has sparked interest among governments and businesses in the Middle East and elsewhere, many of which are monitoring Masdar’s success with a view to potentially launching similar projects.

When it is finished in five to 10 years’ time, Masdar City will accommodate some 50,000 residents, more than 1,000 businesses and a university. With the first phase complete, some people have already moved in. Abu Dhabi’s Masdar City is using M2M technology to help reduce its reliance on hydrocarbons.

The Middle East’s diverse countries are making strides in the digital sphere, from Machine-to-Machine technology to contactless payments. So, where next?
in: about 100 of the 200 students enrolled at the Masdar Institute of Science and Technology have been living on campus since October 2010. Key to the project are Machine-to-Machine (M2M) systems that log the amount of energy being consumed in each building. This is a tried-and-tested method for the government, whose Abu Dhabi Water and Electricity Authority (ADWEA) already uses M2M to assess the volume of resources its citizens use – crucial in a desert environment.

In Masdar City, a series of monitors analyzes both mechanical and human energy consumption. Whenever a resident switches on a light or opens a refrigerator door, for example, an intelligent digital grid leaps into action. Subsequently, if, say, an oven has been left on for more than a specified amount of time, the grid sends a message to the power provider, which switches the oven off to conserve energy. Throughout the buildings, lighting and temperature are centrally controlled for maximum efficiency; while showers are automatically turned off after a few minutes to keep water usage down.

“It’s about maximizing efficiency of use to better match supply with demand,” says Keith White, MENA Consulting Director for ICT advisory firm Ovum. “By knowing what is being used at any one time through automated meter readings and M2M apps deployed on a smartphone, ADWEA can shift consumption. Whenever a grid sends a message to the power provider, which switches the oven off to conserve energy. Throughout the buildings, lighting and temperature are centrally controlled for maximum efficiency; while showers are automatically turned off after a few minutes to keep water usage down.”

Indeed, healthcare in the desert environment is set to benefit from further developments in digital technology. Solutions on the horizon include smartphone apps that log daily food intake and exercise, and video conferencing that allow doctors to conduct appointments with patients online. There are applications that generate automated SMS reminders for people to check their vital signs, take medication or arrange check-ups, and electronic patches for measuring heartbeat, temperature and hydration. Information collated from the patch can be sent to a doctor through a cellphone, meaning that patients no longer have to arrange regular checkups.

Government applications
The emergence of M2M technology in the Middle East merely scratches the surface of the digital developments taking place there, however. One development seen in the past few years has been the arrival of smart ID cards that allow residents to pay for government services. Most notably, Omani authorities launched an eGovernment initiative in 2009 in which all resident and citizen ID cards are embedded with an ePurse that can be topped up with cash at terminals in bank branches. The ePurse – a project of the Royal Oman Police (ROP) in association with the Information Technology Authority and Bank Muscat – allows cardholders to pay for government goods and services at ROP directorates, ministries and municipal buildings. “(ePurse) greatly reduces fraud and theft, it reduces cash-handling costs and it is a highly secure system,” said Lt-Col. Jamal Bin Said Al Taie, ROP’s Assistant Director-General of Finance, at the launch.

Identification is another key area for digital developments. For example, the UAE government has been rolling out a mandatory ID smart card for residents that functions as an ePassport.
The Review

The Review

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The Saudi regulator, SAMA, requires all banks to provide customers with debit cards embedded with EMV chips to track residents and prevent people who have either entered illegally or been abandoned once in the country from staying. The chip-embedded cards contain the holder’s biometric data, which is linked to a unified government database.

With the scheme having now been extended to all Qatar residents, expatriates and locals with chip cards can access services via self-service kiosks in various government and commercial buildings. The system will soon have more services and greater levels of security following an agreement between Gemalto and Qatar’s Supreme Council of Information and Communication Technology. Powered by Gemalto’s Coesy eGov 2.0 system, the new application will expand its existing eServices and provide up to 50 new ones for holders of the Qatar ID card. Customers will be able to complete visa applications, health-card renewals and commercial registrations, and pay electricity bills – all without leaving the house.

Banking applications EMV cards are prevalent in Saudi Arabia, where the regulator, SAMA, requires all banks to provide customers with debit cards embedded with secure EMV chips. Banks have welcomed the move, however, as EMV cards provide an extra safeguard against identity theft.

Banks in the region have been taking advantage of digital technology, too – notably through EMV instant issuance, which allows them to give ‘chip and PIN’ debit cards directly to customers in their local branches. Whether opening a new account or requesting a replacement, customers receive their card on the spot. Employees in the bank’s in-house personalization bureau load the customer’s data on the card before printing it and giving it to the customer then and there.

The system uses secure technology by Gemalto and partner Fundamo.
Global snapshot

Nearly three million online users in Mexico visited a banking website in June 2011, about 225,000 more than in 2010, according to web analytics company comScore. That means that, of Mexicans with internet access, 14.7% used online banking facilities. This is less than Colombia's 21.7% and Chile's 34.8%, but still greater than the Latin American average of 10%. Mexico's most-visited online banks were Grupo BBVA and Citigroup.

Sources: comscore.com, www.havasdigital.com

Mastercard is working with banks in Georgia to introduce a commercial NFC payment service. It is developing mobile-based products, services and platforms that will later be provided to the banks. The commercial service will kick off in 2012. MasterCard is using experience it gained in Turkey, where it first introduced its contactless payment facility to Europe.

Source: nfcworld.com

Magyar Telekom, Telenor and Vodafone have collaborated with three market-leading operators – MasterCard, OTP Bank and SuperShop – to establish the Hungarian Mobile Wallet Association, which aims to ensure the successful implementation of universal mobile NFC services. Hungary’s 10 million consumers will be among the first in Europe to benefit from these services.

Source: latinbusinesschronicle.com

Payment card usage in Ireland now exceeds that of cash: the Irish spent a total of €22.8 billion on debit cards in 2010, compared with ATM withdrawals of €22.3 billion. While the use of payment cards is on the up, Ireland has some way to go before cards become the norm: just 36% of transactions were made with cards, compared with the European average of 96%.

Source: smartcardstrends.com

A new app for smartphones aims to fight corruption in Cameroon, which was ranked 146th out of 180 countries in the Corruption Perceptions Index 2010. The app, NoBakchich, will give people up-to-date information on the cost of public service procedures, such as starting a business or acquiring a driver’s license. The app’s developers hope it will help consumers and businesses to avoid falling prey to officials demanding bribes for services.

Source: cellular-news.com, transparency.org

Thailand’s Electronic Government Agency has announced its goal of putting all government services online by 2015. It plans to introduce its first eService, the “national single window,” by the end of 2011. This service will allow citizens to access electronic data from 35 state agencies and private companies in the areas of import, export and logistics.

Source: egovonline.net

Peruvian web users logged an average of 27 hours online during July 2011, making the country one of Latin America’s most internet-engaged countries. Of Peru’s 29 million people, 4.2 million aged 15 and older accessed the internet from home or work during that month. Social networking is users’ favorite activity, with 90% of them visiting sites such as Facebook. Retail is lagging behind, however, with a little more than half of users visiting shopping sites.

Source: comscore.com

At least six million South Africans now have internet access on their phones. Thirty-nine percent of urban dwellers and 27% of rural inhabitants are now browsing the internet on their mobile handsets, according to research from World Wide Worx, backed by First National Bank.

Source: itnewsafrica.com

More than US$8 billion in NFC mobile transactions could be conducted in China by 2014, according to new figures by ABI Research. In 2010, 45,000 NFC handsets were shipped to China, along with 50,000 microSD format NFC add-ons and 2.5 million SIMpass solutions. As of the end of March 2011, there were 868 million cellular subscribers in the country.

Source: nfcworld.com

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Source: itnewsafrica.com

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Source: nfcworld.com
All eyes on Brazil

Brazil has stood out during the global downturn, posting healthy growth figures while more developed nations were sinking into recession. In less than a decade, 30 million of its 190 million citizens moved out of poverty and into the middle class – now Brazil’s largest social grouping. The country is in frenzied preparations for the 2014 World Cup and the 2016 Olympics and Paralympics. This is a country on the move.

Nowhere is this more evident than in Brazilians’ take-up of digital technology. They love to communicate, and social media is big business in this emerging economy. Google’s Orkut social network has dominated among internet users, but Facebook and Twitter are fast overtaking it. In July 2011 alone, 2 million Brazilians opened Facebook accounts.

eFinance is another development that Brazilians have enthusiastically adopted. Payment card use is growing, as are internet banking, online bill payment and internet shopping. And the government’s new biometric ID card has been called one of the most technologically advanced identity cards in the world.

Digital Brazil, an interactive PDF supplement from Gemalto, looks at the many facets of digital technology and how it is making Brazilian citizens’ lives easier. We examine everything from internet-connected TVs to technological developments in transportation, and talk to Gerson Rolim, Brazil’s outspoken digital advocate.

To read the full version of Digital Brazil, visit gemalto.com/digital_brazil

Brazilians made 12.8 billion card transactions in 2010

There are 28 million Facebook users in Brazil – that’s 15% of the population

4% is Brazil’s estimated economic rate of growth in 2011

30 million Brazilians have entered the country’s middle class since 2003
Over the course of a single week in August 2011, the euro was on the brink of collapse, the UK was engulfed in rioting, the US had its credit status downgraded and investors were fleeing the markets and converting their cash into gold. The world has so many other problems that you’d be forgiven for thinking that corporate social responsibility (CSR) and ‘green’ projects might not be at the top of many boardroom agendas right now.

But smart companies are taking time to analyze their business structures in the face of global crises and ensure that they’re resistant to future shocks in what could become an ever more volatile world.

Sustainability and efficiency aren’t just wishy-washy buzzwords: they make good business sense. And technology, from low-energy CPUs to unified communications and Machine-to-Machine (M2M), is making a significant contribution to the field.

It’s not just environmental concerns that are pushing companies toward greater efficiency, however. David Noble, CEO of the UK’s Chartered Institute of Purchasing & Supply, says: “After the recent political unrest [in the Middle East] and the Japanese disaster affected supply chains all over the world, many businesses were caught out. Supply chains have become longer and more complex and there’s a knock-on effect.”

Thinking for the future

As an immediate reaction to the financial downturn of 2008, many companies focused on managing their costs, but this is only a short-term fix – and it looks as if we’re now in a long-term situation. As a result, businesses are examining issues that were once primarily of governmental interest, such as the cost of energy and security of supply, and starting to drive change themselves.

According to a white paper by analysts at HEC and EcoVadis, Sustainable Procurement: Back to Management?, the number of European companies with a formalized methodology for assessing suppliers’ CSR performance rose from one in three in 2007 to two-thirds in 2011. In other words, while governments have been distracted from plans to ‘de-carbonize’ economies by the ongoing macroeconomic crisis, businesses are increasingly taking it upon themselves to invest in sustainable processes and technologies.

The same paper found that the overwhelming driver for sustainable procurement practice was not forced compliance with regulations, but to “avoid risk to [our] brand”. Of the companies interviewed for the report, 84% cited this as a main factor in their thinking, compared with “this is the right thing to do for the planet” at 41%.

It’s no surprise that large corporations are increasingly aware of the need to protect their brands. Activist organizations are becoming ever more canny at getting their message across using social media: within days of producing a Star Wars-inspired ad for a new car, Volkswagen found itself at the mercy of a clever Twitter campaign by Greenpeace that highlighted the manufacturer’s opposition to climate change laws.

And because the brand is all-important, the biggest companies are often the ones implementing change all the way through their supply chains. Large organizations such as banks and mobile networks are now requiring that suppliers meet the same CSR requirements as those in their own mission statements.

Practice what you preach, in other words.

There are, then, four good reasons why CSR and
How to build smarter cities

Good governance doesn’t just apply in the corporate world. IBM’s Smarter Cities initiative is designed to help local governments meet targets for democracy through open data plans, as well as to tackle environmental concerns through efficiency savings and better use of public transportation.

To help city governments understand how to use M2M communications and the “internet of things” to deliver services such as healthcare, energy and utilities, IBM is awarding more than $50 million in grants to 100 municipalities over the next three years.

The first 24 recipients were announced in May 2011 and include Syracuse, New York; Jakarta, Indonesia; and Tshwane-Pretoria, South Africa. Gordon Matheson, the leader of Glasgow City Council in Scotland, was “delighted” when his city won one of the first grants. “Through IBM’s Smarter Cities initiative,” he said, “we hope to maximize the tremendous opportunities for Glasgow to develop low-carbon energy technologies, efficient homes, the provision of affordable heat and the creation of sustainable communities.”

sustainability no longer merely pay lip service to environmental concerns: positive branding; cost savings through energy efficiency, security of energy and material supply in the future; and the potential to win new business through clever innovation. So what can you do? A model worth considering is the one adopted by global computer component manufacturer Intel. It has adopted a three-pronged strategy for Corporate News. Kevin O’Donovan, Global Sales Director for Utilities and Enterprise at Intel, says that, first, the company looked at its own footprint. In particular, publishing information about the power usage and water consumption gave it the opportunity to analyze, throughout the company, where changes could be made, and then motivate people into doing something about it. As a result, since 2008, every employee’s annual bonus appraisal has a weighting for “achievement of environmental sustainability metrics,” and Intel is the largest purchaser of renewable power in the US.

Secondly, Intel’s own products have improved in terms of power efficiency and utility. CPUs that once ran hot and hungry now require much less power and are designed to run virtualized servers, which means that the number of physical computers required in its data centers can be reduced by up to 49%.

Tools of the trade

Wider bandwidth, multipurpose routers, hubs and controller chips also have a part to play. For example, unified communications — shorthand for converged networks that carry both voice and data over the same infrastructure — is often cited as an aid to sustainability because it introduces tools that can reduce travel, such as videoconferencing. But it also means fewer components and less power use in the first place, because one high-bandwidth hub servicing a multitude of traffic types uses less power than two or three doing the same job. And while the individual power savings may not be huge, they can add up to justify the capital expense across an entire organization in terms of return on investment.

The final part of Intel’s strategy has been to use its CSR policies to win new business through innovation. Its data center monitoring software, for example, balances server load not just in terms of getting the best performance, but also by moving CPU utilization physically from one server to another in order to keep temperatures down and reduce the amount of cooling required. It’s the kind of system that can save a client thousands of dollars, but in order to win that kind of business, says O’Donovan, you have to be practicing what you preach.

“We don’t call ourselves a ‘green’ company, though,” he notes, “because that word means so many different things to different people.”

Of this three-pillar strategy, it’s the first stage that sounds the easiest, but it often proves to be the stumbling block. Measuring what’s going on in a large organization can be extremely difficult. Not only do different departments often fail to talk to one another, or at least pursue the same guidelines when it comes to CSR measurement, different IT systems are also often unable to talk to one another.

At Intel, CPUs that once ran hot and hungry are now designed to run virtualized servers, which can reduce the number of physical computers required by 95%.

The use of robust analytical tools that can aggregate and report on multiple types of data from multiple sources will therefore become increasingly important as we move toward ubiquitous smart grids and M2M technologies. Once a company has this kind of complete overview, it can build solutions that work for its own CSR policy and can in turn be sold on for a profit.

The concept of ‘follow the moon’: directing daytime data requests to hubs in parts of the world that are in darkness, while electricity is cheaper and ambient cooling is free. Or smart thinking about smart grids, in which a fleet of electric vehicles can be used as a storage facility when not in use, ready to sell electricity back to the grid at times of peak demand. Or using the idle backup generators in data centers to provide short-term boosts to the grid at similar times.

These kinds of futuristic ideas may be in the early stages of development, but some of them — however fantastical — will probably come to fruition. Because wherever you sit on the climate change/fossil fuel debate, the one thing that no one is predicting is that energy will get any cheaper any time soon. And by sharpening up your CSR policies now, you can make a difference not only to your carbon consumption, but also to your profits.

PUE: measuring performance

Outside of the manufacturing sector, any plans to reduce an organization’s carbon footprint start in the data center, simply because it is often one of the primary consumers of both hardware and energy.

The standard way of measuring data center energy consumption is power usage efficiency (PUE), which is a ratio of how much electricity is used versus how much it takes to run the servers. The average PUE is 1.8, which means that almost as much energy is being used for cooling a building as is being used by its computers. There’s a big industry drive to get PUEs down by virtualizing servers and creating buildings that can be cooled naturally, using outside air rather than traditional air conditioning.

It’s hard to get it right, though. For Facebook’s newest data center in Pinneville, Oregon, the social networking company designed an entirely new type of low-power server, installed solar panels on the roof and replaced high-consumption air conditioning with an innovative water filter that chills the air.

Facebook estimates that the facility has a carbon-busting PUE of just 1.07, yet still came in for criticism by environmentalists because the majority of power it will draw from the grid will be generated by coal-fired power stations. In comparison, many other companies’ data centers are located close to hydroelectric plants: not only are these the most reliable source of power, they also have the knock-on benefit of being powered by renewable resources.
The future on wheels

We’re still waiting for our flying cars, but Machine-to-Machine, contactless and other digital technology is transforming our driving experience. Here’s what’s just around the corner

**Authors**: Laura Evans & Molly Bennett
**Illustrator**: Jamie @ KJA-Artists

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**Make traffic jams interesting**
Location-based information isn’t just for smartphones. Soon, cars will have the ability to pinpoint your current location, identify your music and film preferences and interact in a social way with other cars on the road, crowd-sourcing information from them and conducting online point-of-interest searches while you’re driving.

**Admin on the move**
In the next few years, your car will become a super-smart mobile office, using cloud-based technologies to allow you to complete tasks such as ordering film tickets, making dinner reservations, sending emails and text messages, and even paying tolls and parking tickets. Research firm Gartner predicts that consumers will demand web connectivity in their cars by 2016.

**Let’s talk**
Goodbye touchscreen, hello voice recognition. We’re not quite in Knight Rider territory, but Ford and Microsoft’s Sync platform lets drivers make calls, search for and play music without having to touch the screen – all without using their hands. It’s one of a range of current and future voice-recognition systems that link with smartphones via Bluetooth. Gadgets’ distracting effects could be mitigated by the car itself, which would determine what activities it will allow at any given time according to how hazardous the driving conditions are.

**The ultimate backseat driver**
In May 2011, Volkswagen unveiled its Temporary Auto Pilot system, which allows a car to drive itself at speeds of up to 80mph while being monitored by a driver – which could be useful in monotonous situations such as slow-moving traffic. Meanwhile, Google is already using automated cars for its Street View project, with the hope of commercializing its technology. Fully automated cars are still years from entering mass production, but there’s a lot to look forward to – not least fewer accidents and traffic jams.

**Smart key systems**
Smart key systems use sensors to unlock car doors and start engines without drivers even having to take their key fobs out of their pockets. But these smart keys will get even smarter: using NFC technology, they will store credit for small purchases and function as a ‘swipe card’ for everything from buying train tickets to opening the doors of prepaid hotel rooms. They will also communicate with your smartphone to keep track of fuel economy, oil levels and other information. BMW is already working on a prototype – just don’t lose it down the back of the sofa.

**Digital doctor**
A prototype driver’s seat that can detect imminent heart attacks has been developed by Ford and RWTH Aachen University. The ECG Seat will be fitted with contactless electrocardiogram technology that uses broadband channels to warn other cars of hazards or changing conditions. If you’re about to change lanes, for example, and another ‘talking car’ is approaching rapidly, an alert will sound. The technology could also reduce congestion and even keep traffic lights green if there is a buildup in traffic.

**Safety first**
Carmakers such as Audi are already trialing 4G LTE (Long-Term Evolution) mobile broadband, which enables streaming media and better telematics response. LTE could also dramatically improve road safety. In May 2011, Ford unveiled its vehicle-to-vehicle communication technology, which uses broadband channels to warn other cars of hazards or changing conditions. If you’re about to change lanes, for example, and another ‘talking car’ is approaching rapidly, an alert will sound. The technology could also reduce congestion and even keep traffic lights green if there is a buildup in traffic.

**The keys to the future**
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**Smarter sat-nav**
The 2016 Volkswagen Golf will come fitted with predictive 3D satellite navigation, which uses information from live traffic reports to plot a route for quickness or economy. To save fuel, for example, the sat-nav will use its three-dimensional view to choose a downhill route, which will trigger the engine into economical coasting mode.

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[Image information]

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ay Hammond has been studying payment systems since the early 1980s. That is when he predicted that there would be no cash in Western society by the year 2000. Looking back, he says that he got this wrong because he was hypothesizing about what could be achieved through technology, rather than by examining human behavior.

“If I had been studying people, I would have realized that they are very conservative when it comes to money,” he says. “Clearly, from a technological standpoint only, [a cashless society] would have been easy to achieve, but people are not ready to give up hard cash so easily.

“If you work in the future, you pay a lot more attention to your mistakes than to the things you get right. That way, you find out why you misunderstood.”

With this in mind, Hammond still believes that there are exciting times just around the corner for the payment industry. “The move to mobile devices has changed everything,” he says. “We’ve had digital payments, online and offline, for a long time, but the move to mobile devices such as smartphones is the big change factor. People are getting more comfortable with making payments using their mobile devices, whether it’s for a credit card purchase, a contactless payment for small payments or, in some places, as a proper electronic wallet.”

He believes that ePayments will be ubiquitous in 25 years time, just as cellphones have become: “We will find it hard to imagine what life was like before we paid for things with a swipe or a click.”

Mobile money
Hammond predicts that, in the next two or three years, the use of mobile digital payments in Europe will gradually increase and then mushroom. “By 10 to 15 years from now, he believes, most people will be using their mobile device as a payment tool, for small items or even for payments of a few hundred euros. “By then, it will be more important for people to carry their mobile phone than their [physical] purse or wallet,” he states.

This will apply when we’re traveling-abroad, too. Hammond gives the example of mobile devices that automatically register the local currency and provide real-time translation of prices into the user’s home currency.

The evolution of mobile payments is a fantastic step forward, he says, but as one-off small payments, and the ability to make payments using their mobile device is a key development in payments.

What he got right
Nearly 30 years ago, when the internet had yet to touch the general public’s lives, Ray Hammond had its potential. In The Dh-Lna Handbook (1983), he wrote: “The linking of computers around the world is going to have far-reaching effects, and the spread of knowledge and the interchange of ideas and the dissemination of information are going to produce a revolution in our society. … You [will] become a part of the information age, experience with awe the power of computers and [that] the next generation will take for granted.”

Biometrics is another option. “I do think biometrics will become one of the normal safeguards,” says Hammond, “but it is unclear which type will prevail. Fingerprints seem the most convenient, but they’re not the most secure.”

For Hammond, the rise of micro-payments – electronic payments of very small values, such as for an eNewspaper or an MP3 download – has been the biggest non-story of the past two decades. In his 1996 book, Digital Business, he foresaw a potentially large opportunity for micro-payments to take off for publishing, charities and eCommerce in general.

This did not happen, he says, simply because the major credit card franchise owners would not allow it, and would not reduce their transaction rates to make it worthwhile.

The US still had many competing systems for cellphones – even between states – almost 10 years after Europe had a single standard. “This is changing now, as the huge success of tablet devices and smartphones shows, but Hammond predicts its outcome as, that result, Europeans have had longer to become attached to their mobile devices and are adopting the concept of eWallets and contactless payments more quickly.

On both sides of the Atlantic, however, the biggest issue is security. “The moment you assign value, or cash, to mobile handsets, the question becomes: what happens if it is lost or stolen? While there are dozens of competing security systems out there, ranging from basic numeric passwords to random code generators that can be used alongside the devices, Hammond suspects that the way forward will simply be to limit the amounts loaded on to mobile devices at any one top-up to make them less attractive to hackers.

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Cash forever
Hammond now accepts that cash will never completely disappear, simply because its anonymity is appealing to those afraid of their personal data being collected during an electronic transaction. “Even 10 years from now, there will be some cash around, the conservative of people carrying cash will reduce significantly because there is a growing awareness that money does not exist and that the value of the paper is entirely dependent on society’s willingness to give it value.”

He also described the final arrival of mobile payments as an exciting opportunity to tackle the world’s unbanked population. “The use of the mobile device as a bank account, to store, send and receive payments and even borrow money, is a fantastic step forward, leapfrogging the marketplace where there is a huge gap.

“The evolution of electronic payments is no longer hypothetical,” Hammond states. “By 2015, probably 70% of all payments will be made through mobile devices that are not credit card-based with their mobile device.”
Cinterion scoops two awards

Gemalto company Cinterion and its commercial partners have won two prestigious awards. The top prize in the Home Health category of the Connected World Gold Value Chain Awards went to Aerotel Medical Systems’ e-CliniQ system and the Connect-CELL telehealth homecare hub. The hub automatically collects patients’ medical data and, using a Cinterion M2M module, sends the data securely to health monitoring centers for doctors to analyze. Among other benefits, Connect-CELL can reduce hospitalization costs by up to 30%.

In the Energy Infrastructure category, Cinterion, INSYS icon and RWE Effizienz won for the RWE Smart-Station eCar charging infrastructure, which charges electric vehicles six times faster than traditional electric outlets. There are currently 900 charging points in 14 countries, located everywhere from public parking lots to customers’ homes, and more are being installed.

The awards, given by Connected World magazine, celebrate successful corporate adopters of M2M technology and the solution providers that make this success possible.

Colombia gets its first multi-application EMV cards

Colsubsidio, a non-profit organization in Colombia that distributes social security benefits, has launched a new, all-in-one card for its members. The Multi-Service Membership Card, which features EMV technology and is provided by Gemalto, includes an ePurse, entry to parks and sports centers, and easy access to public transportation in Bogotá, among other features. It’s a much-simplified solution that brings Colsubsidio’s many offerings together in one place.

Easier social networking for Argentinians

Argentinians can now visit Facebook from any type of handset – without a data plan. Personal, one of the country’s three mobile networks, has teamed up with Gemalto to introduce the Facebook for SIM software application. Now, the network’s 17.4 million subscribers can check their feeds, view friend requests and read messages, all from the phone’s main screen.

High-tech stickers for Slovaksians

Slovakian consumers whose cellphones are not NFC-enabled can now make contactless payments – all thanks to a sticker. By attaching Gemalto’s Optelio sticker to any handset, customers of UniCredit Bank Slovakia can join the growing trend for NFC payments. Now, they can make contactless purchases of up to €50 at fast-food outlets, cinemas, supermarkets and other shops across the country; there are 3,000 acceptance points currently in place. Larger payments will require a PIN. The sticker, which forms part of Slovakia’s first contactless debit payment service, has been fully certified by MasterCard.

The percentage of Singaporean students who have experienced cyber-bullying, according to a 2008 survey by the country’s National Crime Prevention Council (NCPC). Statistics like this are what led the NCPC, in partnership with Gemalto, to launch Cyberonia, an online game that teaches 11-year-olds how to stay safe on the internet. Singapore is one of the most connected places in the world: 96% of its children between the ages of seven and 14 go online at least once a year.

The number of customers who will benefit from more secure online banking in Belgium. ING Belgium, part of the global ING Group, is using Gemalto’s Ezio suite of end-to-end strong authentication solutions to help meet the country’s strict regulations for online security and to address the growing hacker threat. The offering includes the Ezio Class card reader, which gives customers secure access to their bank accounts from anywhere that has an internet connection.

The leading banking group in Sweden and the Baltics turned to Gemalto when it needed to unify its diverse IT security systems. Swedbank, which has 10 million private customers and 300,000 corporate clients, picked the Proteva converged badge solution to provide secure access to data networks and physical access for its 20,000-strong international workforce, whether on site or remotely. It was the first cross-sea project for Swedbank, which acquired Finnish banking group Hansabank in 2005.

Costs by up to 30%.

Among other benefits, Connect-CELL can reduce hospitalization costs by up to 30%.

How’s my driving?

provide GPS tracking solutions.

How’s my driving?

provide GPS tracking solutions.
The father of the cellphone has spent his life championing mobile technology

AUTHOR MOLLY BENNETT
ILLUSTRATION OWEI FREEMAN

It’s the archetypal American success story: born to Ukrainian immigrants in 1928, Martin Cooper is now a millionaire. But over the course of his journey from Depression-era Chicago to his current status as a respected inventor and entrepreneur, Cooper did something that set him apart from other self-made men: against all odds, he championed a technology that would change the world.

Every time you use your cellphone to make a call, send a text message or check your Twitter feed, it’s Cooper you should thank. He led the team at Motorola that, in 1967, invented the first handheld cellular phone, the Motorola’s DynaTAC prototype, on the streets of New York City. Neither Cooper nor Motorola had pioneered cellular technology, however. — AT&T’s Bell Labs, led by Dr. Joel Engel, had developed the system, which allowed calls to switch from one cell to another while staying on the same channel. But Bell Labs made a fatal mistake when it decided to concentrate its efforts on putting this technology to use in car phones.

It must have been a bittersweet moment for Dr. Engel, then, to be on the receiving end of that first call. Cooper, who turns 83 on 3 April 1973, when he demonstrated the first handheld cellular phone, had already cut the weight in half and, in 1983, the DynaTAC went on the market for $4,000 — about $9,000 in today’s money.

Landmark invention
His engineering expertise culminated in that first cellular phone, which weighed 2.2lbs and had a battery life of just 20 minutes. (As Cooper has said, “that wasn’t really a big problem because you couldn’t hold that phone up for that long!”) Four versions later, he and his team had cut the weight in half and, in 1983, the DynaTAC went on the market for $4,000 — about $9,000 in today’s money.

By that point, Cooper had left Motorola to start a company called Cellular Business Systems, which provided billing systems to cellular operators. It proved an astute business decision: in 1986, after accumulating a 78% market share, he and his partners sold it to Cincinnati Bell for $22 million.

His next venture, in 1992, was ArrayComm, which develops smart-antenna technology for more efficient mobile communications. He also helped bring to market the Jitterbug, a basic handset aimed at older consumers that his wife, Arlene Harris, designed. He also co-founded (again, with Harris) Dyna LLC, a technology incubator that advises companies and the government on telecommunications issues.

But engineering fans may know him best for Cooper’s Law, which states that spectral efficiency — the maximum amount of information that can fit into all of the useful radio spectrum over a given area — has doubled every 30 months since Guglielmo Marconi patented the wireless telegraph in 1892, and will do so indefinitely. His law has not yet been broken.

In 2010, the global number of cellular phone subscriptions hit five billion, and in many countries penetration exceeds 100%. With multiple patents under his belt, and possibly more to come, it is a fitting result for Martin Cooper: the man who wouldn’t take no for an answer.