"I don’t want remote banking. I want my bank to be close: in my pocket, at home, in the office and wherever I am when travelling.”

CYRIL, NORWAY

Payments are going digital, contactless and mobile at a stunning pace. And while bank branches are still very much part of our urban landscape, the move towards eBanking and mBanking is accelerating. Simultaneously, all over the world, an increasing number of consumers, having grown up with internet and mobile phones, are digital natives and they expect their bank to follow.

At Gemalto, we develop solutions designed for a secure and convenient consumer experience – across all channels. Solutions that help banks increase efficiency, boost growth and stay ahead of the consumer curve.

We call this approach Gemalto for Banks.

WELCOME TO THE AIRPORT OF TOMORROW

THE SMART CITY: EFFICIENT, GREEN AND BETTER CONNECTED
THE TECHNOLOGY THAT’S POWERING GERMANY’S ECONOMY
EASY WAYS SMALL BUSINESSES CAN SIMPLIFY SECURITY
Welcome

Why digital technology is going places

If you’re reading this magazine, there’s a good chance you’re a tech-savvy business traveler who relies on personal devices that enable you to buy, communicate and get you places.

This edition focuses on the airport of the future, where new digital technologies will help put the convenience back into security. Like you, I’d prefer to do without all that standing in line and taking my clothes off at security, dampening the airport experience. Well, the future could be brighter for us.

As head of marketing at Gemalto and a resident of Austin, Texas, a primary technology hub in the United States, I’m well placed to see how new technologies will positively affect our lives. 4G/LTE has arrived in the US, with most major carriers rolling out services nationwide, bringing a faster and more reliable broadband experience to smartphones and tablets. The magic of near-field communication (NFC) is also turning our phones into wallets, transportation tickets and loyalty cards. I’ll be one of the first to experience this when Isis launches in my hometown this year.

If storing so much payment information and other personal details on a portable device seems risky, the good news is that, behind the scenes, companies such as ours are working to ensure that your personal data stays private.

In this issue of The Review, we tour some of the world’s smartest cities (page 12) and show how the developing world uses the mobile to bring citizens in remote areas into the banking system (page 26).

We also look at how technology is powering Germany’s economy, give our top tips on simplifying SME security and take a look at the science fiction predictions that came true.

Best wishes — and let us hear from you.

Paul Beverly,
Executive Vice-President, Marketing, Gemalto

Contributors

Frances Maguire
Frances, the former editor of Banking Technology magazine, is a freelance journalist covering all aspects of banking, foreign exchange and derivatives trading.

Adam Oxford
Adam has been writing about technology for more than 15 years and has been published in dozens of newspapers, technology magazines and websites.

Allan Hall
Based in Berlin, Allan has been a journalist for 35 years, writing about business and crime for such publications as the UK’s Sunday Telegraph and Australia’s The Age.

Tamsin Oxford
Tamsin has been a journalist and editor for nearly 20 years. She specializes in the consumer and business IT markets and has edited titles such as PC World Magazine.
“The full extent of his legacy went unrecognized for 100 years”

In this issue...

4 DIGITAL DIGEST
What’s new in digital security

8 DIGITAL BULLETIN
France’s car-sharing scheme, LTE goes global and Saudi Arabia gets instant issuance

12 SOCIETY
How smart is your city? M2M technology is making our cities greener, more efficient and better connected

18 SOLUTIONS
Five ways SMEs can simplify security It doesn’t have to cost the world – here’s how to do it

20 DIGITAL PLANET: SPORTS
Our new feature looks at the technology being rolled out at the world’s major sporting events

22 INNOVATION
Enjoy your journey! How digital technology is putting the glamour back into air travel

26 SOLUTIONS
Innovation nations Mobile banking’s pioneers are where you may not expect them

28 SOCIETY
Change is in the air From manufacturing to healthcare, digital technology is powering Germany’s economy

32 INNOVATION
Less fiction, more science A look at the science fiction inventions that have come true

34 TRENDS
Reach out and touch someone NFC technology: the latest in mobile advertising

36 DIGITAL BYTES
The latest news from Gemalto

38 DIGITAL LIVES
Unsung hero Sir Jagadish Chandra Bose, one of science’s greatest polymaths
One step closer to robot butlers

If you’ve ever woken up in the morning, made coffee and opened the fridge only to find that the milk had curdled, smart appliances may be the solution. At the 2012 Consumer Electronics Show (CES), Korean electronics manufacturer LG unveiled a range of appliances made “smart” by its LG ThinQ technology, including an oven, refrigerator, washer/dryer and vacuum cleaner.

Machine-to-machine (M2M) technology is at the heart of the smart grid that powers LG ThinQ. It’s all connected: using a smartphone or tablet, consumers can monitor their appliances’ energy use, check food expiration dates, see when their roast potatoes will be ready and even instruct the robotic vacuum cleaner to get to work.

Energy reduction is one of the main benefits. The smart washing machine, for example, will only operate at the most cost-effective times, and the fridge can adjust its temperature to take advantage of decreased energy rates.

And if something goes wrong, the smart diagnosis function allows the service technician to pinpoint what’s wrong, potentially saving on a costly home visit.

So while we’re still waiting for a robot butler that will clean the house and make our dinner, it seems we are one step closer.

7 billion

The number of smart secure devices that will have been shipped by the end of 2012. This includes SIM cards and microcontroller payment cards for use in applications from smart meters and government IDs to NFC payment cards and tablets.

Source: Eurosmart

Tablet nation

Tablet computers are now the second most popular way for Americans to watch full-length television programs, according to a survey by media giant Viacom. It asked 2,500 people aged between 8 and 54 about their TV viewing habits and found that tablets have leapfrogged computers as people’s medium of choice, second only to the traditional television. Out of time spent watching full-length TV, 15% is now viewed on tablets. And since tablets’ advent, viewing on desktop computers and smartphones has declined.

Tablets aren’t just for entertainment: the DLI 9000,
China’s mega mobile-payment market

Everything is bigger in China. It has the world’s biggest population, with 1.3 billion people – and counting. It is home to the world’s largest suspension bridge: the 4,000ft-long, 1,100ft-high Aizhai Bridge in Hunan province. And now it’s set to become the world’s biggest mobile-payment market.

According to an April 2012 report from market analyst Kapronasia, 441 million active users will be making US$84 billion in mobile payments in China by 2015. It says the market is doubling in size every year; at the end of 2011, China’s m-payments market was worth US$7.6 billion and had 218 million users. Zennon Kapron, MD of Kapronasia, said: “2012 will prove to be a crucial year for the mobile payments industry as Chinese authorities establish final technology standards.”

The other area of potentially huge growth is in smartphones. Currently, the country has only 6% smartphone penetration, with most consumers using standard “feature phones.” As mobile-payment apps become more common and easier to use, we may see even more Chinese consumers switching from traditional payment methods to mobile.

from Data Ltd. Inc., comes equipped with a module that allows contactless payments and also includes a magstripe, EMV and barcode chip reader, as well as a PIN pad. It is designed with the retail and hospitality sectors in mind: customer-facing staff can use it to check stock or take a meal order, and take payment then and there.

2012

'S00-'10s

'00-'10s

Snapshot: mobile money

The percentage of adults who have used a mobile phone for financial transactions

Kenya 68%
Sudan 52%
Gabon 50%
Algeria 44%
DRC 37%
Somalia 34%
Tajikistan 29%
Uganda 27%
Angola 26%


Read more about the developing world’s adoption of mobile banking on page 26.
The sun shines on Apple
Apple has announced that it will power its main data center, in North Carolina in the US, entirely by solar power by the end of 2012. It is building two solar farms over 250 acres that, once up and running, will supply 84 million kWh of energy each year. Apple also plans to convert its other two server centers to coal-free electricity by the end of 2012.

South Korea makes its mark
South Korea has introduced biometric technology to its government procurement e-bidding system. Introduced in 2010, the system allows 44,000 public organizations and 220,000 suppliers to post and bid for work online. Now, as of May 2012, bids will only be submitted when the registered bidder’s fingerprint is authenticated, preventing illegal proxy bidding and bid rigging.

The US moves one step closer to chip and PIN
Payment card provider MasterCard plans to launch a cross-industry group that will collaborate on rolling out chip and PIN technology in the US. Among the group’s tasks will be to outline a standardized consumer experience; create a common understanding of EMV-enabled cards, devices and terminals; and share best practice. Currently, the vast majority of US payment cards still use magnetic stripe technology.

Bringing relief to the reef
Australia’s Great Barrier Reef is the world’s largest structure composed of living things. Stretching 1,600 miles, it contains 3,000 individual reef systems, coral cays, islands and beaches and is home to countless exotic and rare species. But for years, the reef has been under threat from factors including fishing, tourism and climate change-induced coral bleaching.

eReefs, a new A$25 million (US$27 million) citizen engagement program launched by the Australian and Queensland governments, is using digital technology to map and prevent damage to the reef. It combines customized e-portals, mobile communications, modeling and forecasting techniques, engaging “citizen scientists” who can help monitor marine and coral life.

“It is not currently possible to visualize, model, understand and communicate the whole-of-the-reef system due to its vast scale and complexity,” said Dr John Schubert, Chair of the eReefs Project Board. eReefs should make it possible. With the collated data from citizens and other partners, the aim is to inform policymakers, scientists and local communities of the best ways to preserve the Great Barrier Reef for future generations.

Event calendar
Gemalto regularly participates in trade shows, seminars and events around the world. Here’s a list of those taking place in the next few months.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Sector</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–13 Sept 2012</td>
<td>MMA MF</td>
<td>Telecom</td>
<td>Istanbul, Turkey</td>
</tr>
<tr>
<td>17–19 Sept 2012</td>
<td>NFC World Congress</td>
<td>Telecom</td>
<td>Nice, France</td>
</tr>
<tr>
<td>18–19 Sept 2012</td>
<td>LTE Asia</td>
<td>Telecom</td>
<td>Singapore</td>
</tr>
<tr>
<td>18–19 Sept 2012</td>
<td>SIMposium Asia</td>
<td>Telecom</td>
<td>Singapore</td>
</tr>
<tr>
<td>10–12 Oct 2012</td>
<td>CTIA Enterprise &amp; Applications</td>
<td>Telecom</td>
<td>San Diego, USA</td>
</tr>
<tr>
<td>14–18 Oct 2012</td>
<td>Gitex</td>
<td>Telecom</td>
<td>Dubai, UAE</td>
</tr>
<tr>
<td>22–25 Oct 2012</td>
<td>Mobile Money Summit</td>
<td>Corporate</td>
<td>Milan, Italy</td>
</tr>
<tr>
<td>13–15 Nov 2012</td>
<td>Mobile Roaming World Summit</td>
<td>Telecom</td>
<td>London, UK</td>
</tr>
<tr>
<td>14–15 Nov 2012</td>
<td>Africa Com</td>
<td>Telecom</td>
<td>Cape Town, South Africa</td>
</tr>
<tr>
<td>28–29 Nov 2012</td>
<td>MMA MF</td>
<td>Telecom</td>
<td>Miami, USA</td>
</tr>
</tbody>
</table>

8,000
The number of mobile malware samples that internet security provider McAfee detected in the first quarter of 2012. The majority of them came from third-party app markets, rather than official ones. Android devices saw a big leap in malware, with numbers doubling from the previous quarter.

Source: McAfee Threats Report: First Quarter 2012
Introducing

PERSONAL PROTECTION

for all your private files

SanDisk gives you increased protection for your private files with password protection and file encryption.

The included SanDisk SecureAccess™ software lets you share files while keeping others totally secure.

Plus, select USB flash drives come with an offer of 2 GB of secure online storage provided by YuuWaa™ for easy file backup and access from any web browser.

Think of it as your own personal bodyguard for all your private documents.

Keep your private files, private

SanDisk
STORE YOUR WORLD IN OURS®
Car pools: the next generation

CityzenCar’s users can rent cars to others – and vice versa – using the power of SMS.

When Nicolas le Douarec and his colleagues were considering setting up a peer-to-peer car-sharing scheme, they knew there would be no shortage of potential customers. “All the cars we needed were already there, in front of our eyes, parked in the street,” says Le Douarec. “We just had to free them from their prison – from their parking.”

CityzenCar, which was founded in 2011 after five years of development work, allows individuals across France to rent cars or offer their own vehicles for private rental for a few hours or days at a time for a modest fee.

It describes itself as a peer-to-peer “social network,” rather than just a transactional platform between customers.

The idea is to keep the transaction as simple as possible: members are covered by CityzenCar’s insurance scheme and there is no commission. Arguably the key selling point is that, after members have signed up on the company’s website, all subsequent communication is done by simple text message.

But with users renting out personal possessions worth thousands of euros, they naturally need to feel assured that the communication system is secure.

So, in February 2012, CityzenCar introduced an SMS-based communication solution from mobile-commerce provider Netsize, a Gemalto company. “SMS is the only really universal communication ‘protocol’ for mobile situations,” says Le Douarec.

When an owner receives a rental request by SMS and approves it, the driver gets a text message with the car’s details and location. The owner can then either give the keys to the driver in person, or authorize CityzenCar to unlock the doors using the CityzenBox, which allows the driver to open the vehicle using a temporary code and his or her mobile phone.

It’s such a simple idea, and peer-to-peer car sharing is not unique to France. There are similar companies operating in a number of other European countries, such as the UK, Spain and Germany, as well as in the United States, Japan, Canada and Australia. They are all part of the growing phenomenon of “collaborative consumption” in which, thanks to technology, individuals can swap, barter, trade and rent goods and services on a massive scale.

CityzenCar hopes that its own brand of car sharing will catch on. So far, it has 12,000 members in 2,000 different towns and villages in France, and its initial aim is to have at least one person offering a car for sharing in all of the country’s 36,000 communes. “After that, our market is Europe,” says Le Douarec.
Ask anyone who has tried to surf the internet using 3G or mobile broadband in major European cities at peak times and you’re likely to get an expression of frustration. Why? Mainly because the speeds in metropolitan areas during the morning and evening peak hours are between one and two megabits per second (Mbps) — significantly slower than many home broadband connections.

According to Rob Bamforth, an analyst with research house Quocirca, the capacity issue is why the world’s cellular networks are moving slowly, but inexorably, to 4G — also known as LTE (Long-Term Evolution). LTE will support speeds well into the tens of Mbps, even at peak times.

The good news from a user perspective is that LTE services will be with us far faster than the 3G networks were, largely because LTE is highly flexible in the frequencies it can use: most carriers across Europe and Australasia are planning to reuse existing 3G and 2G frequencies, as well as any available new frequencies their regulators allow them to use. The multiplicity of frequencies has its downsides, however; namely that the 4G-enabled iPad 3 only works on US frequencies.

Integrating LTE coverage may be the biggest technical challenge for carriers, but several companies are developing LTE pico- and femtocells that shops and offices can install to route cellular calls through their landline broadband connections for better indoor services. At the Mobile World Congress industry event in Barcelona in March 2012, California’s Mindspeed was first out of the gate with an LTE femtocell designed for plug-and-play consumer or business installation.

As the LTE global deployment brings more bandwidth and higher-speed access to users, the question now is how to monetize these mobile broadband capabilities. The most popular use for data of this sort is still video, and it is now in the hands of carriers to develop their own multimedia video-calling services that can compete with Over the Top (OTT) players such as Skype in order to secure data revenues.

Apple’s latest iPad comes equipped with 4G/LTE capability – but where can we actually use it?

The good news is that LTE services will be with us far faster than the 3G networks were.

But revenue-gathering isn’t the only goal. Carriers must also develop services that will work alongside those offered by OTT providers so that customers have continuity of service — when on holiday, for example — even when they’re out of reach of Wi-Fi. Users will demand intelligent and flexible subscription options, and LTE is the perfect opportunity for carriers to build loyalty and attract new customers.
On the spot

The challenges of issuing, activating and using bank cards have long been common grievances of providers and customers alike. The time delay in dispatching a card and its corresponding PIN, the security concerns associated with the allocation of such sensitive information, and the financial costs of what can often prove a convoluted process are just a few of the universal frustrations.

The patience of banking customers in Saudi Arabia is further tested by issues specific to the country, including its size, the lack of a standardized address system and logistical challenges with courier services and the associated costs.

Saudi banks faced another test following the Saudi Arabian Monetary Agency’s mandate in 2005 that all cards issued in the kingdom should be compliant with the Europay, MasterCard, Visa (EMV) standard and dynamic data authentication (DDA) to ensure security and global interoperability.

Saudi banks have traditionally issued magnetic stripe cards, and the migration to chip and PIN is complex. Banks now need to generate a set of data to personalize an application, manage public-key and secret-key cryptography, and insure the transaction on behalf of the bank’s back office, all in real time.

Gemalto’s Dexxis instant-issuance bank card has provided the solution for Saudi Arabia. Dexxis enables banks to issue cards on the spot and allows customers to select a PIN instantly.

For businesses, the benefits are huge. Banks maintain full control over the entire card-issuance process, and by hand-delivering cards to customers, they avoid lost or stolen cards, saving money spent on activation. Extra revenue is generated through increased card usage and new customer acquisition.

Al Rajhi Bank, the biggest financial institution in Saudi Arabia, embarked on the world’s largest rollout of a smart banking card instant-issuance solution. It has deployed 800 of these solutions across its 500 branches in the kingdom and is already reaping the benefits. The bank now issues up to 24,000 cards every day and has issued more than 3.5 million EMV chip cards to customers since launch.

Hussam Nasser, Gemalto Sales Manager in charge of the Al Rajhi account in Saudi Arabia, says the instant-issuance cards have improved the experience for customers by saving them both time and money. “Customers are able to get their card and PIN instantly from the branch,” he says. “Now, there is no need to wait 10 days to get a card and another 10 days before you get your PIN.”

He also believes that more face-to-face contact with customers, in an age when online banking is becoming increasingly common, can be beneficial. “It is good to have your client in the branch from time to time,” he says.

Al Bilad Bank, another Saudi financial institution, is also using Dexxis in more than 120 branches. Now, customers receive their cards in just three minutes, from initial inquiry to production. The whole process is in Arabic, too, and as the transaction is face to face, it can be tailored to the customer: for example, there is a personalized reward program offering discounts on relevant purchases, such as hotels and sports clubs.

Instant and personalized: that’s digital in action.
The Review is your magazine. We want it to be informative, inspiring and entertaining – and we’d welcome your thoughts on how we can make it even better.

There’s an added incentive: if you complete our short reader survey by 31 August 2012 and leave us your details, we’ll enter you into a draw to win one of two fabulous new iPads.

Just visit review.gemalto.com and follow the instructions. You can also subscribe to the magazine, free of charge.

The Review goes digital
We are delighted to announce that we are soon launching a fully interactive version of our award-winning magazine for your tablet computer. To be notified when it is available, simply tick the box on our survey and enter your email address. We’ll send you an email when the app is available from the iTunes App Store.

review.gemalto.com

Terms & Conditions
Acceptance of the rules is a condition of entry and entry instructions form part of the rules. Entry indicates acceptance of rules. For full terms and conditions, please contact rob.sawyer@wardour.co.uk. 1. The competition is open to all recipients of Gemalto’s The Review magazine, excluding employees of any company in the Gemalto group and any person who, in the promoter’s reasonable opinion, should be excluded due to their involvement or connection with this promotion. 2. Entrants must complete the online questionnaire. Only one entry per person. 3. Closing date is 31 August 2012. 4. All valid entries will be entered into a free prize draw. Winners will be the first two entries drawn at random from all qualifying entries by an independent judge on 3 September 2012. 5. There are two prizes of one iPad. Prizes will be mailed within 28 days of the winner being drawn. 6. Winners will be contacted by phone or email 10 days after the closing date. 7. Winners will be announced in the October issue of The Review. Promoter: Gemalto SA, 6 Rue de la Verrerie, 92190 Meudon, France.
How smart is your city?

For our cities to thrive in the future, they need to get smart. Networked sensors and collaborative environments are driving innovation and preparing our cities for a population explosion.

Cities, especially those with identities that transcend national boundaries, have always been the cultural anvils on which history is forged. From the Mediterranean city states of early western culture to the nomadic Kubla Khan’s Xanadu, the dense concentration of people and ideas makes cities special.

Today, the city plays a more vital role than ever. By 2050, the UN estimates that more than 70% of the human race will live in cities, up from just over 50% today. As more and more of us relocate to urban centers, it’s here that the problems of population growth, resource scarcity, conflict and social justice must be solved. Some people, such as Jonathan Carr-West of the UK’s Local Government Information Unit, frame it as an existential issue: if we are to survive as a species, the time has come to make our cities smart.

The characteristics of a smart city

In these metropolitan hubs of the near future, ubiquitous networked sensors use machine-to-machine (M2M) technology to monitor everything from traffic flows and energy use to the movement of citizens and democratic organization. The data collected is used to improve life for citizens, adapting the behavior of the city in real time to be at its most efficient. If, in the clever, IT-literate city of 2012, you can download an app that tells you the bus timetable, in the smart city of the future you’ll know the...
real-time position of every bus and train and be able to alter routes based on live feedback and public need. These transformations are already here. In Rio de Janeiro, IBM has designed and installed an Operations Center that acts as a data hub for everything that happens in the city. The US$14 million installation monitors everything from traffic management and crime control to traffic flows and weather conditions — sending out warnings to the hillside favelas if there’s a risk of landslide.

No other city has a facility quite like the one in Rio, but they’re catching up fast. Researcher MarketsandMarkets predicts that the market for smart city apps will grow by 14.2% by 2016 to reach a value of US$1 trillion. In China alone, dozens of its emerging megacities, including Taiyuan, Huizhou and Weihai, have just embarked on a state-sponsored five-year plan to adopt smart technologies. With its billion-strong population and high-density urban centers, China is under intense internal and external pressure to minimize pollution and maximize efficiency. The rest of the world is therefore watching closely to see what it can learn from China’s great experiment — and what the revenue-generating opportunities might be.

Indeed, the exciting thing for cities is that this is not a passive market. By embracing smart solutions now, experimental urban centers are becoming leaders for the rest of the world to follow. One of these is Sant Cugat in the Catalonia region of Spain. The town of 81,000...
has designated an area of the city as a Smart Street that makes use of M2M technology. Here, networked sensors monitor everything from energy use in buildings to the level of moisture in park soil, so that sprinklers only come on when it’s dry, rather than being controlled by a timer. More sensors are deployed in streetside garbage bins, so refuse collection routes can be designed to be as efficient as possible.

It may seem odd that a small town in cash-strapped Spain is experimenting with high-tech solutions like these, but María Serrano Basterra, IT Director at Sant Cugat City Hall, says it’s vital for the future.

“We believe that local government has to deal with the current management of the city, but also prepare for the future,” she says. “As local administrations are close to people, providing direct services to citizens, we are committed to carrying out necessary efforts to manage the city in an efficient, effective and sustainable way. So the smart city model is now an opportunity for bringing future quality of life to the city.”

In the Smart Street, sensors have been installed in every parking bay. They relay information about free spaces back to a central hub that is then used to guide drivers to free spaces using street signs, smartphone apps and software for GPS units. But this is not just about making life more convenient – it can ease traffic flow and raise money for the city. According to Mischa Dohler, CTO of Worldsensing, which installed the network, a parking space is used, on average, for 40 minutes in every hour, but demand is often 200% to 300% of the total available spaces. If you can increase the amount of time the spaces are in use by just two or three minutes per hour, the technology pays for itself in about eight months, he says.

Smart city technology can also be turned to civic engagement and improvements in local democracy. For Colleen Hardwick, founder of PlaceSpeak in Vancouver, Canada, smart technologies can help to demystify the political decision-making process and make it more accessible to the general populace.

PlaceSpeak is a tool that alerts citizens whenever a public consultation is happening in their area and allows them to ask questions or make comments online. “Public meetings result in the usual suspects turning up, representative of 3% to 5% of the population,” Hardwick explains, “and telephone surveys are skewed...”

Colleen Hardwick, founder of PlaceSpeak in Vancouver, Canada, smart technologies can help to demystify the political decision-making process and make it more accessible to the general populace.

Securing the Autolib

Green technologies and smart cities are so closely related as to be inseparable. As well as being vital components of the smart grid and the deployment of renewable energy sources, smart cities also enable resource sharing. There’s no better example of this than the Autolib network of electric vehicles in Paris: subscribers simply hop into an Autolib car, swipe their card and then drive off.

Creating this kind of convenience is tough without compromising security: as well as subscriber details and making sure the cards can’t be cloned, the vehicles themselves need anti-theft measures.

“We use the same technology that we’ve used for many years in cycle-sharing schemes,” says Xavier Lardunat of Gemalto. “Inside the Autolibs, we use Cinterion technology for charging you for the amount of time the car is active.”

I now just walk a few meters, swipe my card, unplug the car from its power socket and off I go. It’s brilliant and has already taken me all around Paris... For the kids, I just bring along booster seats, which are easy enough to carry.

Emilie Walmsley, 39, writer, Paris, France
City budgets are tighter than ever, but smart technologies have enormous potential to save money. Implementing them, however, is often beyond the financial, technical and human resources available to administrators. The good news is that individual volunteers and companies from the private sector are more than happy to make raw data useful, often at a fraction of the cost. The onus on authorities now is to open up information repositories for others to innovate with. This is open data.

Greg Hadfield, an internet entrepreneur and organizer of the Open-Data Cities Conference, describes open data as “the ‘straw’ that creates the bricks that build the walls of the palaces of the future.”

Opening up data is expensive. Established computer systems for city administration generally aren’t designed for sharing real-time information. Administrations have to establish priorities and start in the places where there’s most demand. These are often transportation, education and crime statistics. Bus, train and taxi applications dominate the current implementations of open-data apps.

The important point is that, with any new procurement of IT systems, the ability to share linked data has to be built in from the start. The advantage for public-sector employees is that external apps will often make their own lives easier – in the UK, one of the biggest users of a website about government expenses is the government itself, because it’s easier to use than internal systems.

Open data can also stimulate economic growth. The Kenyan government is leading the open-data charge in Africa. Dr. Bitange Ndemo of the Ministry of Information and Communications believes that it will reduce corruption, increase transparency and generate about 5% growth in trade. This, he says, would be equal to the entire international aid budget and “would change Africa forever.”

Open data: the building blocks of the smarter city

because they’re not based on proportional sampling.” PlaceSpeak, she says, brings the civic conversation to citizens, rather than the other way around. Non-governmental services can use it, too, for planning goods and services, and Hardwick is investigating ways of automating the system to generate online consultations as soon as something like a planning notice is posted.

Perhaps one of the most significant smart city technologies, though, is the M2M-enabled smart meter. Already installed in a third of US homes, these energy meters report live information about usage back to suppliers. The benefits are two-fold. First, customers can use that data to see their real-time usage and cut costs accordingly. Second, they’re a vital component of a “smart grid” that knows how much energy customers are using and can plan accordingly.

Smart grids are essential to the inclusion of renewable sources of electricity in our energy mosaic. Wind and solar don’t have the same supply reliability as fossil fuels, since output depends on conditions and whether or not owners of grid-connected domestic photovoltaic arrays are producing or consuming energy. The energy grid must be able to react rapidly to high demand or low supply by bringing more generators online when necessary, and shutting them down when not in use.

Two of the biggest issues that all smart technologies must address, however, are those of privacy and security. One person’s 24/7 efficiency monitoring is another’s Orwellian nightmare, and installations such as the Rio Operations Center have become a focal point for campaigners worried about intrusive corporate surveillance. Smart meters, too, have raised some concerns about both the security of that data and customers giving away more information to utility companies than they’re comfortable with. This isn’t just a philosophical worry: in the US, the FBI recently issued a warning to electricity providers that hackers were targeting smart meters, looking for drops in demand that might indicate when customers were not home.
Addressing these concerns is paramount if smart meters are to take off, and Gemalto’s Xavier Larduinat says the latest generation of meters uses the same levels of encryption and security that have proved successful on mobile networks. “It is very solid at setting credentials and working out who can gain access,” he says, “and it provides a secure, encrypted channel between the meter and the providers.”

The important thing for energy companies to realize, Larduinat says, is that customers must get perceivable value from the exchange of their data to appreciate the benefits of smart technologies over the perceived loss of privacy. This can include the ability to access their meters remotely and turn appliances off when not at home — or even taking another lesson from the mobile world. “We envision having something like an ‘app store’ of services on a meter,” Larduinat says, “which will be of benefit to the customer, not the utilities.”

From parking to social care, there are many ways we can make our cities smarter. And with rising populations and a steady migration to urban areas, time is of the essence. According to the latest data from the World Bank, out of the 215 recognized countries and states, there are only 14 in which people are choosing to move away from urban areas.

Our cities need to get smart, and fast.

To view an animation of M2M’s potential, scan this QR code with your smartphone or visit cinterion.com/m2m-world/explore.html
5 WAYS SMEs CAN SIMPLIFY SECURITY

For small businesses, the basis of a good security policy is a simple plan that everyone can follow — and costs nothing but time

AUTHOR NICK BOOTH

If a computer system has been compromised, human error is usually to blame. Take the smart phone, arguably the most important piece of business technology a SME will use. According to IT consultancy Avanade, 88% of companies worldwide use mobile devices of some sort for work. But security measures have not kept pace with this trend.

As the UK’s News International phone hacking scandal has shown recently, phones can easily be hacked if their owners fail to change the default password. And according to a 2011 survey by risk advisory firm Kroll, 60% of fraud cases in all businesses are inside jobs.

The problem is that business systems have grown in complexity at such a pace that we struggle to keep up. We have to remember myriad passwords and learn processes that seem to change by the day. Who could blame us for letting the lengthy best-practice handbook languish in our in-trays and making our work the priority?

A study by marketing company Vanson Bourne indicates that companies are beefing up their IT security in response to a perceived security threat. Of 500 IT decision-makers in large enterprises, four in 10 said they have increased their IT security budget following high-profile breaches at other organizations.

Smaller companies do not always have this option. They are less likely than medium-sized or large firms to use a security consultant or conduct an internal audit. IT security is likely to be left to the MD, the CEO or the office manager — in other words, somebody who already has another job to do and is not an IT specialist.

All is not lost for the security-minded SME, however. If most security breaches are based on human error,
and simplicity is the key to devising a workable policy, then SMEs have distinct advantages over their bigger competitors. Here are some simple tips for keeping your company safe.

1 Assumption is the most frequent human error, according to Chris Potter of management consultant PwC. “If security is doing its job, it goes unnoticed,” he says. “The flipside of this is that people don’t value it and take it for granted.”

When manufacturers of phone systems or routers supply you with equipment, they assume that you are going to change the default password. The consumer, in turn, assumes that the default password is safe. Meanwhile, the hacker assumes that you haven’t changed the password from the default. Guess which assumption is proved right most often!

Don’t forget that crime is constantly evolving, with new tricks and new viruses being devised by the hour. Be sure to download all software updates, and change your passwords regularly.

2 Often, people ignore security if it hampers their day-to-day business, says Alastair Broom of security firm Integralis. “This is largely because they are oblivious of the consequences,” he says. “Does John Smith in the finance team understand the risk in syncing the company’s annual report to DropBox so he can work on it at home? Or emailing something to his personal email account so he can finish work at home?” By informing users of the consequences, these problems can be neutralized.

3 “Many security programs involve lengthy policies and procedures that are never read and gather dust on a shelf somewhere,” Broom says. “Explain clearly why the company has certain policies and the benefits. If you just describe what you’re doing without justification or benefits, employees will resist.”

4 Human error (see box) often creeps into systems when there has been no design consideration for the different aptitudes and abilities of the workforce. Some people are always going to be more willing to undergo certain processes than others. Business leaders know their teams better than anyone else, so should avoid one-size-fits-all solutions.

5 Social media has become the online-commerce platform of choice for SMEs. It’s easy to use and it opens up a world of marketing possibilities, but it’s also far more open to abuse, warns Richard Law of identity management company GB Group. “You need to verify who the other person is that you’re doing business with,” he says. “The problem with online is it’s still a bit of a Wild West environment.”

The “bring your own device” (BYOD) trend, and using these tablets and smartphones to access both traditional and new cloud computing apps, means that moving, storing and securing data is now much more complex.

Complicated security processes, such as encryption and verification of users who want to log into networks, can be simplified by using a smart card or OTP token that mobile workers can carry around with them. These portable authentication gadgets use digital certificates or produce a unique one-time password that strengthens access control to PCs and mobile devices.

Meanwhile, the scope for human error is as wide as ever. Encrypting data is a sensible move and an investment that soon pays for itself. But in the meantime, creating a highly secure password for your company’s Facebook page would be a good start and costs nothing. As for the rest, just keep it simple.

Top 10 human errors

- Failing to change default passwords
- Using infected memory sticks
- Losing memory sticks
- Responding to unsolicited emails
- Using the same password for every account
- Using “password” or “1234” for your password
- Keeping passwords on sticky notes attached to your monitor
- Failing to update security patches
- Failing to save or back up data
- Sending sensitive company data unsecured
With their massive crowds and media attention, major sports events are the perfect platform to launch state-of-the-art technologies.

**United States**
CrowdWave’s digital videogame technology will soon be found at basketball and hockey venues throughout the National Basketball Association and the National Hockey League, respectively. A complex system of cameras and software will capture the detailed movements of individual fans to control branded big-screen experiences. By simply moving their arms, the crowd can take part in games and polls during breaks in play.

Source: CrowdWave

**Poland and Ukraine**
Skidata equipped stadiums at the Euro 2012 soccer tournament with cutting-edge access management and point-of-sale (POS) systems for event access and food services. Poland’s new national stadium boasts 76 turnstile gates with 156 ticket readers, giving fans swift and secure access to the venue. There are also 310 POS systems at kiosks and restaurants throughout the arena.

Source: Skidata

**Brazil**
The half-time whistle at a soccer match is often the signal for hundreds of fans to scour their smartphones for the latest scores and updates from other games. Not surprisingly, 3G networks sometimes struggle to cope with the sudden burst of activity from supporters who are desperate to find out what’s happening elsewhere. But fans attending the 2014 World Cup in Brazil will be relieved to hear that stadiums in São Paulo, Cuiabá and Curitiba will boast 4G, which is 10 times faster than 3G. This way, fans will no longer have to endure an agonizing wait to see the latest scores.

Source: Gemalto
United Kingdom

London 2012 will be the first “contactless” Olympic Games. Barclaycard has launched a stick-on credit card that will allow customers to make wave-and-pay purchases from their mobile phones. Sales outlets at all Olympic venues will accept this type of payment, reducing waiting times for fans eyeing the refreshment kiosks or souvenir stands.

Source: The Guardian [UK]

China

It may be only three years before we see the next generation of athletic shoes at a major sports event. If all goes to plan, athletes could be wearing trainers with radiofrequency identification (RFID) tags, accelerometers and motion sensors at the 2015 Athletics World Championships in Beijing. The shoes will be capable of transmitting data to the cloud for result analysis and instant postings on social media platforms.

Source: Wired

Qatar

Come summer 2022, soccer fans from all corners of the globe will be in Qatar to watch their respective nations battle it out for the sport’s greatest prize: the FIFA World Cup. With matches taking place at 12 stadiums, the powers-that-be will need to develop a public transportation system capable of ferrying thousands of fans to and from each venue. The Government has 10 years to revamp the transport infrastructure in the capital city, Doha. One proposal is to operate trams and trains that generate power whenever they speed up or slow down – using the same kinetic energy recovery systems (KERS) found in Formula One cars. The energy stored when a train or tram brakes is converted by KERS into the power needed for acceleration.

Source: Dubai Metro

South Africa

Could the 2013 Africa Cup of Nations in South Africa be the first major soccer tournament to implement goal-line technology? Testing is under way on a Danish system called GoalRef, which uses magnetism to determine whether the ball has crossed the line. The technology is based on the Doppler effect, with electronic probes in the lining of the ball and sensors on the inside of the goal. Debates over whether or not a controversial goal should have stood will surely be consigned to history if GoalRef proves a hit.

Source: The Mirror [UK]
Enjoy your journey!

We love to travel, but we hate navigating endless lines. As airports embrace digital technology, our journeys are set to get interactive — and a lot easier.

**Time out from the 9 to 5 grind is precious — and the last thing we want to do on our vacations is spend hours shuffling from check-in line to security patdown on our way to that sunlounger and fruity cocktail. For frequent business travelers who spend huge chunks of their working year visiting suppliers and clients, these little delays add up even faster.**

But while we love to complain about airport experiences, we also love to travel: after a dip in 2009 due to the global economic slowdown, airline passenger numbers are on the rise once again. This growth looks set to continue, with the International Air Transport Association (IATA) predicting that there will be 3.3 billion air passengers annually by 2014 — up from 2.5 billion in 2009.

Digital technology is well on its way to giving all these travelers a seamless experience, from mobile check-in to the use of biometrics at passport control.

The smartphone is the backbone of this digital revolution — and J.P. Morgan predicts that 657 million of them will be sold during 2012.

It also predicts that near-field communication (NFC) handsets will top 700 million by 2016 — and four in five of the world’s major airlines plan to introduce NFC for tickets, boarding

**Author** Dave Howell

**Illustration** Liam Bardsley
Airline apps with digital boarding passes let me go straight to the security line – and keep me up to date with any delays to my flight. And it’s not like the early days, when security staff had to hunt around for a scanner. Now, they’re built into their podiums.

Mark Harris, freelance journalist

Most major airlines can now send boarding passes straight to passengers’ smartphones

Innovation  Travel

VOX POP

Gemalto.com 23

3.3 billion

The predicted number of air passengers that there will be annually by 2014

Self-tag their luggage with their own chip-enabled bag tag.

Biometric security is another hot area. According to IT company Unisys, 57% of US citizens, 85% of Australian citizens and 91% of UK citizens would be happy to use more biometric technology in airports if it increased security.

In 2006, SAS introduced fingerprint-based biometric check-in for passengers who take domestic flights within Scandinavia. The airline’s NFC-based SmartPass sticker, which passengers

Passes and other services such as advertising by 2014, according to SITA, the international air transport IT and communications consortium.

All this is giving the travel industry a mobile platform on which to build increasingly sophisticated and useful apps. It will make our journeys easier and more secure — and maybe even put the glamour back into air travel. Let us take you on a journey...

Departures

Digital technology makes an impact even before you arrive at the airport. Not only can you use any number of apps to check your flight status, you can also check in online or on your smartphone. Lots of us are doing it: SITA projects that 80% of travelers will use mobile check-in by 2018.

While we have been able to use our phones to check the status of our flights for some time, airlines are introducing new and innovative functionality. Japan Airlines will shortly be offering a NFC service to its passengers. US Airways sends boarding passes to its passengers’ smartphones. And Virgin Australia offers a service where travelers can print their passes at the departure gate by scanning a barcode on their mobile device.

Those without smartphones can benefit, too. Alaska Airlines’ “airport of the future” at Terminal 6 of LAX has replaced check-in counters with self-service kiosks that should reduce waiting times to just four minutes, according to the airline. And Australian carrier Qantas is showing how NFC will be implemented on a practical level. Passengers on its domestic flights are given loyalty cards enabled with radiofrequency identification (RFID) tags that also serve as boarding passes. Travelers can also

British Airways

3.3 billion

The predicted number of air passengers that there will be annually by 2014

Self-tag their luggage with their own chip-enabled bag tag.

Biometric security is another hot area. According to IT company Unisys, 57% of US citizens, 85% of Australian citizens and 91% of UK citizens would be happy to use more biometric technology in airports if it increased security.

In 2006, SAS introduced fingerprint-based biometric check-in for passengers who take domestic flights within Scandinavia. The airline’s NFC-based SmartPass sticker, which passengers

Most major airlines can now send boarding passes straight to passengers’ smartphones
Navigating unfamiliar airports can be a daunting experience – especially if you only have a short layover. At Copenhagen Airport, you can try out an augmented-reality app that could make new-airport anxiety a thing of the past.

Using the app, passengers can find information on where they are in the airport, what services are available in their vicinity and how they can find their gate – all by using their smartphone’s camera to “scan” their immediate surroundings.

Christian Poulsen, IT Director of Copenhagen Airports A/S, says: “This exciting way to use new technology gives passengers a new dimension to their stay at the airport, which makes it even easier for them to plan their time.”

While augmented-reality apps have been around for a couple of years, they have so far been restricted to the open air. The reason for this is that they use GPS to determine the user’s location, but GPS signals cannot penetrate concrete – a common component of the structure of most airports. Copenhagen Airport’s app, however, uses triangulation and signal strength from Wi-Fi access points to determine the location of individual passenger smartphones. In doing so, it offers its passengers the world’s first true augmented-reality app that works indoors.
Dubai International Airport is going one better, offering virtual “assistants” that give passengers travel information. The bilingual assistants — projections from digital signage — greet and interact with passengers, passing on information that will get them from check-in to boarding as smoothly as possible.

Arrivals
After your flight, during which you catch up on email and send a few tweets using the airplane’s Wi-Fi connection, you touch down and join the line for passport control. If you’ve got an ePassport — one with a biometric chip in it — you can sail through the eGates, which use facial-recognition technology to match the data to that in your passport. Frost & Sullivan analyst Dominik Kimla says that the eGate system is “vital for managing passenger flows more efficiently at border checkpoints.”

The Coesys eBorder Gate platform from Gemalto is one example. Available for use by passengers with biometric passports, the system is self-service — slashing inspection time and reducing human intervention to help authorities cope with the increase in the number of air passengers.

If you haven’t got a biometric passport yet, you soon will. According to the latest research from the International Civil Aviation Organization (ICAO), 93 of the 193 UN member states now issue ePassports and 90% of all passports will have biometric capability of one sort or another by 2016.

Airports’ adoption of digital technology is only just beginning. “The revolution is actually an evolution,” says Norm Rose, analyst at Travel Tech Consulting. “[It is] continuing today’s efforts to increase self-service capabilities for the passenger and communicating to the traveler the status of their flight and bag in real time, while enhancing and improving their airport experience.”

Giovanni Bisignani, the former Director General and CEO of IATA, said: “We spend US$7.4 billion a year to keep aviation secure. But our passengers only see hassle. Passengers should be able to get from curb to boarding gate with the minimum of stress. That means without stopping, stripping or unpacking, and certainly not groping. That is the mission for the checkpoint of the future. We must make coordinated investments for civilized flying.”

What does this mean for world-weary travelers? If all goes to plan, it will mean less time waiting in line, less-intrusive and more robust security, and more time relaxing before hopping on that plane to their next destination.
Each market has its own approach, but mobile banking is bringing security and convenience to countries from the US to Kenya

Innovation nations

**W**hichever country we live in, the way we bank is changing. In western nations, as branches close and consumers look for greater speed and convenience, banks are turning to smartphone apps and other solutions to complement their existing service offering. Pingit, a peer-to-peer fund-sharing smartphone app from Barclays Bank in the UK, is one recent example.

But in the developing world, the benefits of mobile payments and banking have long been recognized. Particularly in Southeast Asia, Africa and parts of South America, basic infrastructure and limited funds have meant that banks have bypassed traditional branch-based banking and gone straight to mobile. For almost a decade in some regions, basic cellphones have been central to enabling payments and banking services for the 2.5 billion adults considered “financially excluded.”

With basic handsets being affordable and readily available in all corners of the world, it’s a logical platform. Mobile phone ownership continues to rise, with 5.4 billion handsets expected to be in circulation globally by 2015. The extensive mobile infrastructure is being used to extend financial services to a huge segment of the population not catered to by traditional branch-based banking.

There are plentiful examples from developing economies. In Africa, Kenya has taken the lead in mobile banking through the M-Pesa service, which was launched in 2007. Today, seven million Kenyans, accounting for 65% of the population, use their phones to pay bills, buy goods and services, send and receive money, withdraw cash, top up airtime balances and manage their bank accounts. A password is needed for each transaction and it is protected by state-of-the-art security — but the biggest reason for its success is that it is based on standard GSM technology and can therefore be used by any mobile phone.

**African ingenuity**

South African bank Absa has won several international awards for its CashSend service, which allows customers to transfer cash from their own account to anyone in the country, even if they do not have a bank card or account. They do this by using internet or mobile banking or an Absa ATM to create a six-digit access code that they give to the recipient. Once the transaction has been confirmed, the CashSend system sends a unique 10-digit PIN to the recipient’s mobile phone. The recipient then enters this PIN into any Absa ATM to instantly receive the transferred cash.
In Zimbabwe, network operator NetOne's SIM-based OneWallet service allows users to make peer-to-peer money transfers, pay utility bills and even have their salaries paid directly to their phones. NetOne is also working with the Zimbabwean government to allow OneWallet to be used for pension payments so that those in remote locations would no longer need to travel long distances to collect their money.

In Latin America, Redeban Multicolor, Colombia's largest banking group, launched the country's first SIM-based mobile banking solution to more than 20 million mobile subscribers in 2007. The introduction of mobile banking in Colombia has been instrumental in cost reduction for its banks, cutting the number of ATM transactions and reducing branch traffic to paying bills, checking account balances or recharging mobile pre-paid accounts.

One of the biggest mobile developments in Latin America recently has been Transfer, a joint venture between América Móvil (Telcel), Banamex and Banco Inbursa. Launched in April 2012, it is a financial inclusion project aimed at bringing Mexico’s 80 million unbanked people — 70% of the population — into the regulated financial system. Transfer turns mobile phones into secure payment instruments for setting up bank accounts, transferring money, withdrawing cash from ATMs, purchasing airtime and paying in stores. It’s all underpinned by Gemalto technology that will grow along with the service. The project partners hope to extend the project to include services such as insurance and micro-loans, and to roll it out across the region.

Branch numbers dropping
While western banks are forging their own paths, the developing world’s approach to banking offers much to be inspired by — especially given the growing number of branch closures in the developed world.

In 2010, for the first time in 15 years, more bank branches closed than opened in the US: according to government statistics, almost 1,000 branches closed that year. And in the UK, the number of bank and building-society branches has fallen by nearly 11% in the past five years, with more than 1,000 closed since 2002 in both rural and urban areas. The closures have been driven by banks’ desire to cut costs and the rise in popularity of internet banking, which has reduced the number of branch transactions — although customers will no doubt prefer face-to-face contact for big decisions such as mortgages or investments.

For banks, wherever they are, mobile platforms can create significant strategic advantages, including new revenue streams and reduced operational costs. With more than 60% of the world’s population now carrying a mobile phone, any organization dealing with money and identity, which inherently demand security and trust, is looking at the potential of the mobile phone to revolutionize the way people make payments and manage their bank accounts.

What is clear from the experience of developing nations is that the security of mobile applications has been tried and tested, and that a convenient, easy-to-use mobile banking strategy must be well thought out and not simply considered another access point. It is the best channel banks have to get closer to their customers, and what the developing nations have proven is that, if they get the product right, customers will embrace it wholeheartedly.
At weekends, I drive a small truck for a haulage firm for extra money. The autobahn tolls are collected automatically from the firm’s account via cameras above the carriageways. I would like to see more companies in Germany offering eCommerce.

Jan-Phillip Litz, 25, trainee social worker, Bielefeld
Across Germany, digital technology is the engine powering the biggest economy in Europe.

It controls the electricity output of the giant wind turbines now dotting the skyline from the Baltic to the Alps and the Rhine to the Oder. It powers the automated time-and-motion men on the assembly lines of BMW, Mercedes and Volkswagen; the robotic check-in personnel for Lufthansa; ticket dispensers — and timetable informers — for Deutsche Bahn; the collectors of tolls on the vaunted autobahn system; and it provides close to a million jobs for workers in the high-tech industry.

But it’s not just industry that is benefiting from digital technology. German citizens are finding it quicker and easier to accomplish everyday tasks, from paying for lunch to visiting the doctor. So what aspects of the digital world are currently available to Germans? And what lies in wait in a future bearing down on them with the speed of a computer-controlled ICE express train?

**State of the nation**

The government’s ICT Digital Germany Strategy 2015 is driving the country’s adoption of digital technology. Its aim is to expand Germany’s digital infrastructure and networks to meet future demand, and use ICT to cope with social issues such as sustainability, health and administration.

Over the next few years, we’ll see new investment, particularly in start-ups, for electric cars, cloud computing, a nationwide smart road-management system and new internet broadband networks. Other areas ripe for investment include machine-to-machine technology (M2M, or the “internet of things”) and university funding for high-tech courses. All this, the government estimates, will lead to at least another 30,000 jobs in ICT by 2015.

The government initiative that is having the most direct impact on citizens currently is Germany’s identity card, introduced in 2010. Billed as the world’s most advanced contactless smartcard, the card can be used as a travel document and enables transactions such as online banking, airline passenger check-in and tax declaration. Importantly, it also gives German citizens control over which service providers can access their ID card data.

De-Mail is another paperless initiative. Activated in 2011, it is a secure email system that citizens and businesses can use to complete legally binding transactions, cutting administration costs. And in March 2012, the government announced that it is developing an internet-based knowledge platform that means citizens will be able to pay bills, register a change of address and complete other everyday tasks securely — anytime and from anywhere with an internet connection.

**Healthy growth**

Healthcare is a major pillar of the government’s ICT strategy. Since 2011, 81m Germans use the new contactless identity card.
> Germany’s health providers have been distributing secure eHealthcare cards that contain the insured person’s name, photo, date of birth, gender and address, as well as their insurance number, emergency contacts and coverage status. Privacy and security have been paramount in its development: information such as allergies or drug intolerances can also be stored on the card, but only if the patient agrees.

The card marks a shift in the administration of medical care; before, patients had to fill out a paper insurance voucher by hand before visiting the doctor. Now, their clinic simply scans their card. There are benefits for healthcare providers, too: the card streamlines administrative tasks; its photo and PIN prevent fraud; and doctors can carry out diagnoses and treatments faster and more accurately.

Nearly 18 million people already have the eHealthcare card; by 2013, more than 60 million of Germany’s 72 million citizens will have received one.

Banking on change
Money has gone digital, too. Some 47% of Germans now use online banking — that’s more than 35 million customers. Usage of mobile banking has jumped in Germany, thanks largely to better smartphones, affordable data plans and new banking apps. And German consumers’ satisfaction ratings are among the highest in the world; according to Deutsche Bank, 80% of people have confidence in digital banking methods.

This satisfaction is down in part to banks’ focus on security. Solutions such as the Ezio Optical TAN, a credit-card-sized optical authentication reader, aim to reassure users that their money is safe, even when banking online. After they insert their bank card and enter their PIN, the reader generates a one-time password. The user then places the device in front of their computer screen and optical sensors capture the data the user would normally enter manually on a keypad.

No contact necessary
As elsewhere in the west, Germany is part of the contactless wave of innovation. Christoph Siegelin, Vice President of Sales for Central Europe at Gemalto, says that its contactless market is “getting mature very, very quickly.”

“Between now and 2014,” he says, “all 45 million debit cards issued by German savings banks will be of the contactless payment type. This is on an unprecedented scale. The cooperative Volksbanken Raiffeisenbanken group is likely to follow.”

Five other banks — Comdirect, DKB, Landesbank Berlin, Targobank and Volkswagen Bank — confirmed in April 2012 that they plan to roll out Visa Europe’s payWave contactless service this year. Customers with contactless cards simply hold them near a merchant’s near-field communication (NFC) reader and, in a fraction of a second, the terminal processes the transaction and the payment is made.

Germans have been slower to warm to contactless than other countries, but this is changing. In a Euro Kartensysteme poll of 1,040 Germans aged 18-59, 43% said they would like to make contactless payments if given the opportunity.

Moreover, 58% of respondents said they would be happy to use contactless on public transportation, 55%
at the gas station, 42% for general shopping, and 37% for quick purchases at markets and convenience stores.

**Getting around**

German airlines such as Lufthansa have been making use of Germans’ love affair with smartphones for some time: passengers can use them as boarding passes and to check in at virtually all airports. (For more on how digital technology is improving the passenger experience all around the world, see page 22.)

The country’s extensive train network has also adopted this approach. Sometimes, fully half of the passengers using Deutsche Bahn, the German national railway system, have booked online and printed their tickets at home; inspectors on long-distance trains simply scan the tickets.

Information has gone digital, too. M2M module provider Cinterion, a Gemalto company, helped develop Deutsche Bahn’s new information system, which gives passengers real-time information on schedules and delays. Deployed in smaller and often remote train stations where hardwired devices used in larger stations are too expensive to install, it sends real-time updates from the central server over wireless networks to display screens on train platforms.

Just as cameras, publishing, telecommunications and entertainment were changed forever in the early days of the digital revolution, new applications are emerging rapidly. Digital technology is powering what many observers are calling the “Third Industrial Revolution,” where products are made more cheaply, easily and flexibly, and with much less labor. This, in turn, could bring jobs back to “old” economies such as Germany’s that have lost them to the emerging world in the past two decades. And with citizens saving time and money through all manner of digital innovations, it seems everyone’s a winner.

“Between now and 2014, all 45 million debit cards issued by German savings banks will be of the contactless type”
Less fiction, more science

Science fiction writers have long been ahead of the game when it comes to imagining new technology. William Gibson may have coined the word “cyberspace” in his 1984 novel *Neuromancer*, but some people believe that Mark Twain envisioned the internet way back in 1898, in his short story “From the *London Times* of 1904.” But that’s only the beginning of the story. Here are some other notable examples of the technological foresight that can come with an active imagination — and their modern-day manifestations.

**Machine-to-machine technology**

**Then:** The Jetsons, the 1960s cartoon series, is meant to take place in 2062, but the gender roles seem to be 100 years behind: Judy is a housewife and George goes to the office. At least many of Judy’s chores are taken care of by her smart home — it even does her hair and gets her dressed in the morning. And let’s not forget Rosie, the indispensable robot maid.

**Now:** With M2M technology, our refrigerators have the ability to monitor their contents and send us messages when we’re running low on milk. And smart meters allow households to monitor their energy consumption, cutting down on costs. While we may not have robot maids yet, it’s only a matter of time...

**Telemedicine**

**Then:** In *The Machine Stops*, E.M. Forster’s 1909 short story, humans live underground and everything is done through “the Machine.” When the main character, Vashti, has a panic attack, her son, with whom she is videoconferencing, sends an instant message to her doctor and an apparatus emerges from the ceiling, lays cool pads on her forehead and injects medicine directly into her mouth.

**Now:** Mobile health, or mHealth, monitors a patient’s health remotely — particularly useful in rural or underserved areas. Videoconferencing is another tool, as is near-field communication (NFC). One new product, RhythmTrak, is a handheld ECG device that monitors a patient’s heart rate. The data is then transmitted wirelessly using an NFC reader or an NFC-enabled smartphone or tablet, and the patient can forward it to her doctor.
E-readers

**Then:** Polish writer Stanislaw Lem, author of *Solaris*, envisioned eReaders in his 1961 novel, *Return from the Stars*, in which a cosmonaut returns to Earth after a 127-year mission to Arcturus. Paper books are obsolete; instead, their content is recorded on crystals that are read using an “opton” — a one-page book very similar to today’s eReaders.

**Now:** In April 2011, 50 years after Lem’s book was first published, Amazon announced that its sales of eBooks for the Kindle eReader had surpassed its sales of print books.

Credit cards

**Then:** Edward Bellamy introduced the concept of the credit card in his 1888 novel about a time traveler’s visit to the future, *Looking Backward, 2000–1887*. Wandering around the year 2000, his guide shows him a piece of pasteboard that contains no actual money but is punched by the store clerk to show he’s made a purchase.

**Now:** Not only did credit cards go digital many years ago, most now come standard with chip and PIN for added security — and a growing number are contactless, using NFC to allow instant purchases when you wave them over a reader. Seen through today’s eyes, Bellamy’s vision seems more equivalent to an old-fashioned coffee-shop loyalty card.

NFC-enabled smartphones

**Then:** In his 1965 book *The Age of the Pussyfoot*, US science fiction writer Frederik Pohl describes what we would recognize as a contactless-enabled smartphone with voice recognition. In his words, it’s a “joymaker ... your most valuable single possession.” And no wonder: it functions as a phone, credit card, alarm clock, reference library and secretary.

**Now:** This could describe virtually any of the most recent smartphones: Apple’s iPhone 4S comes with its Siri voice recognition technology (though no NFC — yet), and brands from BlackBerry to Sony now offer NFC capability. We may not call themjoymakers, but we would be lost without them.

And the future?

It seems that our most creative scientific brains aren’t confined to the laboratory — they’re also the ones hunched over their keyboards, letting their minds wander into the future. And companies have taken notice: Intel, for one, hired four science-fiction writers to work on its Tomorrow Project, which predicts future applications for consumer technology. So the next time you read some science fiction or watch the latest sci-fi blockbuster, pay attention: it may come true sooner than you think.
Reach out and touch someone

Mobile advertising is big business — and, with the new wave of NFC advertising, it’s set to get even more interactive

Our phones go everywhere with us — from work to the beach. Advertisers know how attached we are to our handsets and have been taking advantage of it for a number of years, using mobile advertising to send special offers to our phones.

Mobile advertising is big business. The global market was worth about €1.75 billion in 2009, rising to €2.61 billion the following year, according to research firm Berg Insight. It predicts that this figure will balloon to €17.2 billion by 2016.

SMS remains the most popular channel for mobile advertisers by a long way, and its ease of use and accessibility on all types of phone ensure it will dominate for some time. But other channels, including mobile coupons, are making headway: revenue from in-app ads in the US and western Europe is US$1.7 billion, according to Strategy Analytics. Advertisers may also make more use of video and social media channels, particularly as more areas get 4G/LTE network access.

But with the smartphone’s increasing ubiquity, there’s a new trick in town: NFC advertising.

Near-field communication (NFC) allows the transfer of data by tapping an NFC-enabled card or device on a reader. Until now, it’s been used primarily in the transportation and payment sectors — but as more people move to smartphones, advertisers have caught on.

NFC-based advertising takes traditional and mobile media to an entirely new level of interaction. Customers need only move their NFC-enabled phone over a tagged advertisement to interact with it. The applications are endless: from smart posters at bus stops, where users can download anything from a coupon to a movie trailer, to integration across all media, with tailored advertisements and offers suited to the area, the market and the time of day.

Advertisers like the idea of NFC advertising because it drives people to their stores. A tap on a poster opens up a virtual world with virtual offers — coupons, loyalty points, voucher codes — that customers can then use in the “real world.”

An opportunity arises

For a view of things to come, look to Asia. The region is by far the world’s leader in mobile advertising, accounting for 49.2% of the market in 2011. Marketing channels such as SMS, NFC and contactless led to revenues of US$1.63 billion there.

Japan has been using NFC for fare payments and financial transactions for the past 10 years, with about 60% of phones NFC-enabled. Once people became comfortable with the technology, NFC advertising was the next obvious move. NFC coupons have been offered at McDonald’s since 2008, and a pilot program saw chips embedded in the straps that...

Making a case for NFC

Without an audience to advertise to, NFC services will wither and die. The first step is for governments, mobile operators, banks and other authorities to convince users of NFC’s value to their daily lives, primarily through financial and transportation applications.

It’s a complex challenge that requires a light touch — witness the Google Wallet, which, nearly a year after it was launched, consumers have yet to embrace wholeheartedly.

So, while advertisers wait for the right environment to be created, they are launching “teaser” campaigns aimed at giving consumers a glimpse into a future where offers and services are tailored to their needs and accessible with just a tap. Then comes the question of security. With NFC advertising, smartphones are tapped on posters that then access the chip’s data to download and install content. So can consumers be convinced that NFC advertising is helpful, rather than harmful?

Miles Quitmann of Proxama says: “With NFC advertising, there is no need to worry, as users will be receiving information without having to submit personal details.”
Smart displays take advertising to a whole new level of interaction.

passengers hold while standing on trains. If they scan them with their smartphones, they are taken to the advertiser’s website.

South Korea is the other regional leader, with more than five million NFC-enabled smartphones sold. Its NFC-enabled mass-transit service has been around since 2002, and it established a trial shopping zone in 2011 that featured NFC coupons, payments and smart posters.

But Japan and South Korea aren’t the only countries experimenting with NFC advertising — and 2012 seems to be something of a tipping point. In January 2012, l’Office du Commerce et de l’Artisanat de Nice launched an NFC-based retail loyalty program called Carte Magique. NFC readers were installed at 200 of the city’s retailers, and customers simply tap them with their cards to accumulate loyalty points and access products and offers.

In March 2012, media buyer Kinetic joined forces with outdoor advertising company JCDecaux to develop the UK’s first large-scale deployment of NFC technology. Thirteen brands, including EA Games and Unilever, participated in a campaign that ran NFC experiences across 300 bus shelters and poster sites throughout Reading, a town of 150,000 people. Content ranged from special offers and coupons to games and music, all of which could be downloaded with a single tap of an NFC-enabled phone. The final results of this campaign were encouraging, with 78% of consumers overwhelmingly positive about the experience, citing NFC’s ease of use.

Dubai, known for its fast pace of life, has also dipped a toe into this new market. In December 2011, Proxama launched an NFC marketing campaign in the emirate in conjunction with Nokia and Vox Cinemas. Aimed at owners of the new Nokia N9 handset, the campaign encouraged them to tap NFC-embedded posters and displays to view movie listings and download coupons. It logged 2,250 interactions in two months at one cinema, with more than 55% of coupons redeemed.

And in the US, the Isis program — a joint venture of network providers AT&T, T-Mobile and Verizon — has created a mobile wallet application that enables NFC payment, coupons and loyalty points. It launched in Salt Lake City and Austin, which it calls “Isis-ready cities,” in the summer of 2012.

Both Proxama’s and Kinetic’s NFC campaigns in their chosen markets have so far been an experiment in success. They raised awareness of the capabilities of NFC-enabled technologies and how companies can use them to their advantage. Miles Quitmann, Managing Director of Proxama, says: “The past 12 months have been focused on demonstrating, to those who might benefit from NFC, what it is all about and how it might work in practice.”

With the success of NFC-based campaigns in Asia and the response to those currently running elsewhere in the world, the technology looks set to grow over the next few years. But it’s only the beginning for this new and innovative advertising channel. In the west, the main challenges are deployment, reach and consumer adoption, but if current trials in these areas are any indication, it looks set to become a major part of advertising’s future.

To watch a video in which parkour and NFC collide, scan this QR code with your smartphone or visit tinyurl.com/NFCParkour
Digital bytes

News from Gemalto

Gemalto named a 2012 Computerworld Honors Laureate

Computerworld magazine has recognized Gemalto for its healthcare project with Seattle Children’s Hospital, naming it a 2012 Honors Laureate in Safety & Security. The project replaced the hospital’s 8,700 employees’ weak passwords with strong authentication and convenient contactless technology. The Protiva .NET product also gives authorized users access to the hospital servers, networks and VPNs. The annual award program honors organizations that use visionary applications of IT to promote and advance public welfare, benefit society and change the world for the better.

North & South America

Secure access for medical professionals

In May 2012, Gemalto launched Protiva MedSecure for the healthcare market. The product provides a comprehensive portfolio of authentication software, digital credentials, secure devices, servers and associated services. It means that responders and medical staff can consolidate their numerous identification badges into one secure, certificate-based credential. The single ID also allows simple login and logout at any terminal, as well as access to different entry points. And two-factor authentication meets compliance with patient privacy and medical record protection guidelines. Additional security features such as encryption and digital signatures for medical forms, or verification of authenticity for medical orders, reduce physical paperwork and create efficient processes.

Sprint chooses Gemalto for 4G launch

Sprint, one of the US’s four largest network providers, has chosen Gemalto to help it bring ultra-fast 4G capability to its mobile subscribers. Gemalto will provide Sprint with the UpTeq LTE universal integrated circuit card (UICC), which is the secure, personalized subscriber module that enables mobile operators to issue, authenticate and manage consumers’ subscriptions. Gemalto will also provide its LinQUs Advanced Connectivity over-the-air (OTA) platform, which manages wirelessly connected devices remotely. Both products will ensure that Sprint customers have secure, up-to-date connections when using its 4G services, which it launched in June 2012.

Big move for Cinterion M2M modules

Machine-to-machine (M2M) module provider Cinterion, a Gemalto company, will now do its part to aid the rollout of 4G-enabled M2M products across North America. The Cinterion PH8 and PHS8 M2M modules recently passed the pre-approval testing stage for mobile network provider AT&T’s 4G HSPA+ wireless network. This means that the products are now available to help wireless solution developers in North America bring 4G M2M products to market faster and more cost-efficiently.

Computerworld magazine has recognized Gemalto for its healthcare project with Seattle Children’s Hospital, naming it a 2012 Honors Laureate in Safety & Security. The project replaced the hospital’s 8,700 employees’ weak passwords with strong authentication and convenient contactless technology. The Protiva .NET product also gives authorized users access to the hospital servers, networks and VPNs. The annual award program honors organizations that use visionary applications of IT to promote and advance public welfare, benefit society and change the world for the better.

Secure access for medical professionals

In May 2012, Gemalto launched Protiva MedSecure for the healthcare market. The product provides a comprehensive portfolio of authentication software, digital credentials, secure devices, servers and associated services. It means that responders and medical staff can consolidate their numerous identification badges into one secure, certificate-based credential. The single ID also allows simple login and logout at any terminal, as well as access to different entry points. And two-factor authentication meets compliance with patient privacy and medical record protection guidelines. Additional security features such as encryption and digital signatures for medical forms, or verification of authenticity for medical orders, reduce physical paperwork and create efficient processes.

Sprint, one of the US’s four largest network providers, has chosen Gemalto to help it bring ultra-fast 4G capability to its mobile subscribers. Gemalto will provide Sprint with the UpTeq LTE universal integrated circuit card (UICC), which is the secure, personalized subscriber module that enables mobile operators to issue, authenticate and manage consumers’ subscriptions. Gemalto will also provide its LinQUs Advanced Connectivity over-the-air (OTA) platform, which manages wirelessly connected devices remotely. Both products will ensure that Sprint customers have secure, up-to-date connections when using its 4G services, which it launched in June 2012.

Big move for Cinterion M2M modules

Machine-to-machine (M2M) module provider Cinterion, a Gemalto company, will now do its part to aid the rollout of 4G-enabled M2M products across North America. The Cinterion PH8 and PHS8 M2M modules recently passed the pre-approval testing stage for mobile network provider AT&T’s 4G HSPA+ wireless network. This means that the products are now available to help wireless solution developers in North America bring 4G M2M products to market faster and more cost-efficiently.

Sprint, one of the US’s four largest network providers, has chosen Gemalto to help it bring ultra-fast 4G capability to its mobile subscribers. Gemalto will provide Sprint with the UpTeq LTE universal integrated circuit card (UICC), which is the secure, personalized subscriber module that enables mobile operators to issue, authenticate and manage consumers’ subscriptions. Gemalto will also provide its LinQUs Advanced Connectivity over-the-air (OTA) platform, which manages wirelessly connected devices remotely. Both products will ensure that Sprint customers have secure, up-to-date connections when using its 4G services, which it launched in June 2012.
Customers of Raiffeisen Banking Group, one of Austria’s largest financial institutions, are now benefiting from safer online banking. It’s all down to Gemalto’s Ezio Edge Optic product, which uses optical sensors to authenticate customers by reading the data they enter and allows them to authorize and sign online banking transactions digitally. And its small size means customers can take it with them, allowing them to conduct transactions wherever they are.

Multi-year UK government contract

The UK’s Driver and Vehicle Licensing Agency (DVLA) has chosen Gemalto to supply between 40 million and 80 million secure Sealys documents for a variety of official permits. These include digital tachograph cards – highly secure polycarbonate driver’s licenses – and biometric residence permits. Deployment begins in 2013, with security features including laser-engraved images to prevent tampering. The new documents will be in line with the European Commission’s initiative to create a standard driver’s license format for the EU.

Oman secures its eGovernment services

Oman is a pioneer in the eGovernment world, having introduced services from eID cards to eVoting. Now, the Oman Informational Technology Authority has appointed Gemalto to secure these eGovernment innovations with its Coeysys eGov 2.0 software and associated training, support and maintenance services. Omanis can now carry out administrative procedures online and sign official documents without physically visiting government offices. They don’t have to install any software and the product works on any personal computer or mobile handset.

More secure online banking in Austria

Customers of Raiffeisen Banking Group, one of Austria’s largest financial institutions, are now benefiting from safer online banking. It’s all down to Gemalto’s Ezio Edge Optic product, which uses optical sensors to authenticate customers by reading the data they enter and allows them to authorize and sign online banking transactions digitally. And its small size means customers can take it with them, allowing them to conduct transactions wherever they are.

Two awards in China

Gemalto’s Allynis and Dexxis products have won awards from two Chinese media organizations. The Allynis Trusted Service Manager, which allows mobile NFC services to be managed securely, was given the “2011 Payment Industry Editor’s Choice of Excellent Products Award” by the PayNews website. And Financial Computerizing magazine presented the Dexxis Instant Issuance product with an “Excellent Solution for Financial Industry Award” for its on-the-spot creation of payment cards.

34 million

This is the number of subscribers to KDDI, the Japanese telecoms giant. It has chosen Gemalto for the country’s first commercial launch of mobile NFC services, including mobile payments, e-driver’s licenses and smart posters. The launch is part of the Japan Mobile NFC Consortium of the country’s three biggest operators, which aims to coordinate the adoption of multiple international NFC standards. KDDI is using the UpTeq NFC SIM-format device, Gemalto’s end-to-end NFC product.
Botanist, biologist, physicist, science fiction writer: Sir J C Bose was a true polymath

Author Barnaby Simons
Illustration Luis Tinoco

Selfless and pioneering, Sir Jagadish Chandra Bose made innumerable contributions to modern science. Considered a man ahead of his time, Bose’s groundbreaking work spanned the fields of physics, biology, botany, archaeology and even science fiction. However, the full extent of this polymath’s legacy went unrecognized for more than 100 years.

Born in rural Bengal in 1858, Jagadish Chandra Bose had a thirst for discovery from an early age. As a schoolboy, he bred frogs and fish and studied the root systems of germinating plants. In 1880, having excelled at college in Kolkata and learned English, Bose traveled to England to further his education.

Off to Cambridge
After a brief spell studying medicine in London, Bose immersed himself in natural science at Christ’s College, Cambridge. His attendance is remembered today with the Cambridge-Bose Scholarship and an impressive bust that stands alongside those of Milton and Darwin. When he returned to Kolkata, Bose developed into an inspirational, if controversial, physics professor at Presidency College.

With India under British rule, the university was obliged to pay nationals only a third of the salary given to their European colleagues. In protest, Bose refused to accept any salary at all, going unpaid for three years. Such was his teaching ability, however, that the principal eventually paid Bose his full salary for the previous three years in a one-off lump sum.

Now armed with some much-needed capital, Bose turned his attention from the classroom to the laboratory. Years of visionary research followed, but it wasn’t until recently that Bose’s initial explorations were properly credited.

Guglielmo Marconi has long been called the father of long-distance radio, but it was in fact Bose who invented the first wireless detection device and who also shortened the length of electromagnetic waves to 5mm. Despite having met Bose in London in 1896, Marconi never cited him as an influence. Marconi went on to receive the Nobel prize in physics and Bose’s contribution to radio went unsung for more than a century.

Thirst for knowledge
In any case, Bose’s wireless discovery was only one of many. He went on to study plant physiology, inventing a “crescograph” that measured the responses of plants to varying stimuli, proving that their growth and health is dependent on the surrounding environment. He also discovered that metals display similar symptoms to living organisms when intoxicated by alcohol, benumbed by the cold or excited by electric currents. And in 1896, he wrote Niruddesher Kahini, the first major work in Bangla science fiction.

In 1917, 20 years before his death, Bose used his life savings to open a research institute in Kolkata. He declared: “I dedicate today this institute — not merely a laboratory, but a temple.” The Bose Institute’s alumni have maintained his philosophy, achieving renown in India and sharing their scientific findings around the world.
Soaring to success with fruitful partnerships

STC the largest telecom operator in the Middle East and North Africa
In an increasingly connected society Gemalto is the leader in making digital interactions secure and easy.

Gemalto is at the heart of the rapidly evolving digital society. Billions of people worldwide increasingly want the freedom to communicate, travel, shop, bank, entertain and work — anytime, everywhere — in ways that are enjoyable and safe. We deliver on their expanding needs for personal mobile services, payment security, authenticated cloud access services, identity and privacy protection, eHealthcare, eGovernment efficiency, convenient ticketing and dependable machine-to-machine (M2M) applications.

Learn more at gemalto.com

Easy ways small businesses can simplify security

The technology that’s powering Germany’s economy

The smart city: efficient, green and better connected

Welcome to the airport of tomorrow