



Government & the Internet

The Economist Survey

For many of us involved in auditing government organisations, the impacts of the Internet have yet to be widely felt, though from the current rate of progress this will not be long in coming. The survey, from the newspaper "The Economist" which is incorporated in this edition of intoIT presents a wide ranging set of views about implementing e-government, with descriptions of many projects on different aspects of governments' use of the Internet. We hope that the information in the articles will provide valuable insight to financial and computer auditors, with some food for thought for performance audits in this rapidly developing area.

CONTENTS

| | |
|-------------------------------|----|
| The Next Revolution | 17 |
| No Gain Without Pain | 19 |
| Quick Fixes | 21 |
| Island Site | 22 |
| A Tool For Learning | 24 |
| Haves And Have-Nots | 24 |
| Sign On The Dot.Com Line | 26 |
| A Local Site For Local People | 27 |
| Digital Democracy | 27 |
| Handle With Care | 29 |

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The Editor of intoIT (e-mail: intoIT@nao.gsi.gov.uk) would welcome readers views on the value of incorporating material such as this survey in the magazine.

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The next revolution

After e-commerce, get ready for e-government, says Matthew Symonds

IN DOWNTOWN Phoenix, Arizona, people are queuing in a grubby municipal office to renew their car and truck registrations. They are visibly bored and frustrated, but what can they do? All over the world, people dealing with government departments and agencies are having to engage in dreary and time-consuming activities they would much rather avoid.

What is unusual about Arizona is that the locals have a choice. Since 1996, a pioneering project called ServiceArizona has allowed them to carry out a growing range of transactions on the web, from ordering personalised number plates to replacing lost ID cards. Instead of having to stand in a queue at the motor vehicle department, they can go online and renew their registrations 24 hours a day, seven days a week, in a transaction that takes an average of two minutes.

What is more, ServiceArizona has not cost taxpayers a cent to set up, and is free to users. The website was built and is maintained and hosted by IBM, which is being paid 2% of the value of each transaction - about \$4 for each vehicle registration. But because processing an online request costs only \$1.60, compared with \$6.60 for a counter transaction, the state also saves money. With 15% of renewals now being processed by ServiceArizona, the motor vehicle department saves around \$1.7m a year.

That allows Penny Martucci, the decidedly ungeeky grandmother behind the project, to devote extra resources to improving her department's offline service. But perhaps even more gratifying for her are the e-mails she gets from satisfied customers. In a recent survey, the Arizona motor vehicle department scored an 80% approval rating for its service, head and shoulders above other departments. John Kelly, the state's ambitious chief information officer, is pushing other departments in the same direction, and has put out to tender a contract for building a portal that will link them all together.

There is nothing spectacular about ServiceArizona, but it is a straw in the Internet wind that is beginning to blow through government departments and agencies all over the world. Within the next five years it will transform not only the way in which most public services are delivered, but also the fundamental relationship between government and citizen. After e-commerce and e-business, the next Internet revolution will be e-government.

Little and late

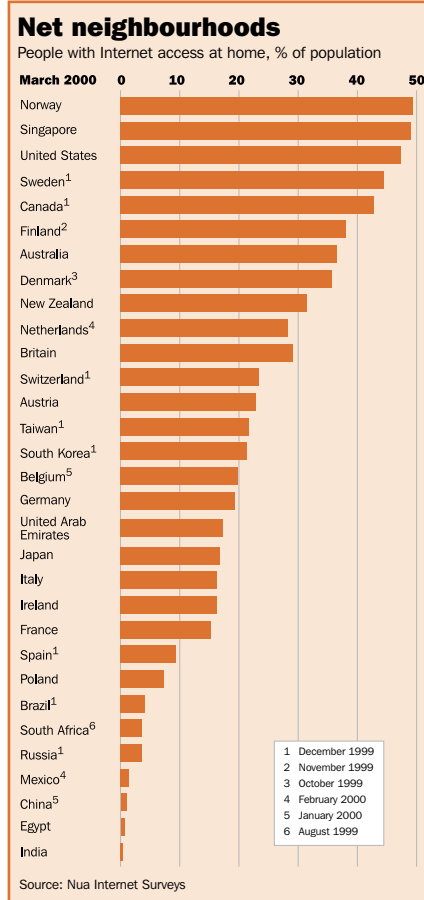
With few exceptions, governments have come late to the Internet. Although the net was born out of a project sponsored by America's Department of Defence, most governments have seen their job as creating a benign environment in which the hoped-for economic and social benefits of the Internet could unfold, rather than actively harnessing the fancy new technology to their own ends.

There have been some good reasons for reticence, as well as bad ones. Governments, even more than commercial enterprises, were deeply worried about the potential impact of the millennium bug (known as Y2K) on their computer systems, and the social disruption that might follow. Much of the available IT funding and expertise was channelled into forestalling millennium disaster.

But even without the distraction of the Y2K threat, governments and their agencies would have lacked many of the private sector's incentives to adopt the Internet. As monopoly suppliers, they are not worried about being "Amazoned" - waking up one morning to find a new web-based competitor with the potential to destroy their business. Transactions with government are rarely a matter of choice, and agencies collecting tax or managing entitlement programmes do not see the Internet as a challenge to their existence. Nor are the people running government services likely to be rewarded - with share options for, say, devising an innovative Internet strategy.

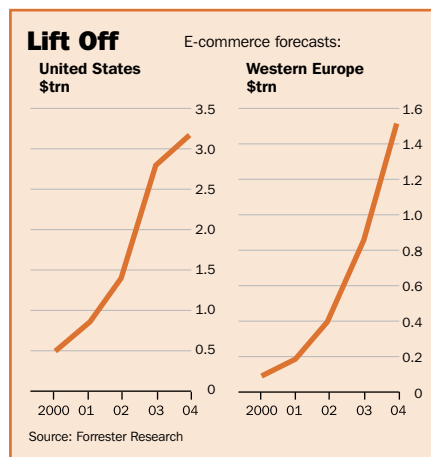
There is also the question of access. Even in America, the proportion of people with an Internet connection at home is still under 50%, and in most of Europe it is less than half that. Governments cannot choose their customers; the services they provide

must be for everyone, and much of what they do involves dealing with the poor, the less-well-educated and the elderly - precisely the people least likely to be wired. Lastly, security and trust are even bigger concerns for government than for the private sector. Banks and insurance companies may know quite a lot about their customers, but nothing matches the range and detail of information that governments require from their citizens. Unless the integrity of that information can be guaranteed, the scope for governments to make constructive use of the Internet will remain limited.



But despite the late start, the pressure is now on to catch up fast. The spur may not be competition in the conventional sense, but talk to public servants and politicians almost anywhere, and the sense of urgency and excitement is tangible. Helped by the big IT vendors, governments are realising that by applying much the same technologies and principles that are fuelling the e-business revolution, they can achieve a similar transformation. Reinventing government, a fashionable but premature idea a decade ago, is at last being made possible by the Internet.

More prosaically, the starting point for most e-government projects is the desire to reduce costs and make tax revenues go further. The potential for savings comes from the sheer scale of public-sector spending and from the opportunities to make internal processes more efficient. American federal, state and local procurement spending on materials and services this year will be around \$550 billion. Some big private-sector companies are now achieving annual savings in the region of 20% by putting their supply chains on the web. If government services in the United States could replicate that, they could save \$110 billion a year. In the European Union, where the member states' combined procurement spending is about euro720 billion (\$778 billion), savings could be of a similar order. As with commercial businesses, the benefits come from the way the web can slash purchasing and fulfilment cycles, lower administrative costs by up to 75% and halve stocks.



Reasons to be "e"

Governments are also under pressure to meet rising expectations of service. Not many people enjoy dealing with their government; they do it because they have to. But that does not mean the experience has to be as dismal as it usually turns out to be. As increasing numbers of consumers become used to the quality of service offered by the best web retailers and service providers, their willingness to accept slum standards in the public sector is coming under strain. If the same 24-hour, seven-days-a-week availability and convenience, fast delivery, customer focus and personalisation became the norm in the public sector, it would not just make life easier, it would fundamentally change the way that people view government itself.

One of the greatest problems for anyone who has dealings with government, whether as a citizen or a business, is its sheer complexity. The average government has between 50 and 70 different departments and agencies. Just finding out which is the right one for the task in hand can be hard enough. Worse, even for fairly straightforward matters such as licensing a business, selling a house or registering the birth of a child, a number of different agencies requiring a plethora of different forms may be involved. Moreover, they expect users to communicate with each of them in turn rather than being prepared to communicate with each other.

One of the basic reasons for public-sector inefficiency - "bureaucracy" - is that, whereas departments are vertically organised, many of the services that they have to deliver require complex collaboration between employees across departments. The British government has for several years been preaching the need for "joined-up government", but has found that the underlying structures of government conspire against it.

The Internet offers a solution to both problems. Increasingly, governments are coming round to the view that they will need to construct Internet portals, similar to consumer portals such as Yahoo!, that can provide a one-stop shop for all of a citizen's needs. A central government portal of this kind has just been launched in Singapore; another is being developed in Austria. In Britain, BT has recently won the contract to build UK Online, a portal to offer government services that should, in a basic form, start up in the autumn.

These government portals are being designed to allow users to find what they are looking for by using questions such as "How do I...?" or asking about so-called "life events", such as a change in marital or employment status. The citizen does not need to know about the organisational complexity behind the scenes because the portal will take him smoothly to where he wants to go. And the same technology infrastructure that is built to link and integrate services for the citizen can provide the platform for a secure government intranet that allows common access for government employees and enables them to work better together across all departments.

Governments have also realised that although a sluggish and half-hearted approach to e-government will not put them out of business, they may not be as immune from competition as they thought. True, the first thing they have to do is to create the right regulatory and public-policy environment for the digital economy - a competitive communications market, universal access, digital signatures, light taxation, online privacy, consumer protection for web shoppers and so on. But they are also becoming aware that their own e-government strategies can have a powerful catalytic effect on business in general.

Just as Ford and General Motors can push their suppliers into doing business with them through online exchanges, so can governments, thus galvanising thousands of small firms into becoming e-businesses. By harnessing the efficiency, transparency and accountability that is inherent in the web to improve all aspects of government-to-business and business-to-government transactions, they can deliver a big economic boost. And by ensuring access for all to the Internet as the main channel of dealing with government, they can be a powerful force in bridging the "digital divide" between the haves and the have-nots and stimulating online education.

Last but not least, by improving the quality of their relationship with citizens, they can make a big difference to the attractiveness of their country, region or city as a place to live and work. This goes beyond the delivery of services through the Internet, and to the beginnings of digital democracy.

The first signs are already there: a Democratic primary in Arizona (again) in which online voting boosted voter turnout to six times its usual level; more accountability for elected officials, thanks to e-mail and web-casting; and online campaigning and fundraising, as in this year's American presidential election.

Yet making e-government a reality will be extraordinarily difficult. Britain's e-minister, Patricia Hewitt, points to one of the more obvious reasons: "If Jack Welch says that GE is going to become an e-business, it does, and pretty quickly. Government is different." Politicians can be as visionary as they like, but unless they can get the machinery of government to take notice,

nothing much will happen. And persuading public servants to abandon their paper-shuffling ways and embrace change on a hitherto unimagined scale will require relentless pressure - as well as some of the carrots and sticks that keep people going in the private sector.

Jay Nussbaum, who heads Oracle's service industries business in Reston, Virginia, has a mantra for e-government: "Start small, scale fast, deliver value." In other words, it is important to bank some quick wins from smaller projects that achieve what they set out to do, like ServiceArizona, before moving on to bigger things like the all-embracing portals that cover every aspect of government activity.

The potential is enormous, but governments will need committed leadership, a full understanding of e-business principles and a clear strategy for overcoming the barriers to change: the departmental rivalries, the hostility of unions, the fears of individuals and the sheer size of the thing. For once, the technology - although crucial to making it all possible - is the least of the worries.

No gain without pain

Why the transition to e-government will hurt

TODD RAMSEY, IBM's worldwide head of government services, does not beat about the bush. "About 85% of all public-sector IT projects are deemed to be failures," he says. That does not mean they are total disasters, but that they usually take longer to implement, cost more and deliver less than was planned. For anyone who is getting overexcited about e-government, that is a sobering reflection.

At least the reasons why big government IT projects get into difficulties are well understood. The trouble often starts with the way contracts are awarded, typically by tender. This can be a nightmare. Steve Dempsey, Andersen Consulting's e-government specialist in Britain, says tender documents often run to 1,000 pages, and picking the winner can take 18 months.

At that point, according to Mr Ramsey, the contract can become a battleground as both sides take out their frustrations on each other. Often the customer - ie, the agency or government department involved - deserves blame for poor project management and inflexibility, but vendors too must take their share for over-promising and under-bidding. They, in turn, would argue that this happens because public servants tend to award contracts on the basis of price rather than value, quality or past performance.

Another problem - not unique to the public sector, but especially prevalent there - has been a tendency for IT integration firms to over-customise (and thus over-complicate) applications. This is because officials are reluctant to ask a highly unionised workforce to change its working practices so that software can be used straight out of the box.

And changes could involve more than working practices; they could entail big job losses too. There may be scope for retraining some clerical and counter staff to improve offline customer service, but many existing workers will not adapt to new working patterns. Private industry can redeploy people more easily by changing its

remit, but that is not an option for government departments and agencies whose goals and powers are usually mandated by statute.

With so much scar tissue around, the confidence shown in the prospects for e-government may seem surprising. But according to Elizabeth Echols, a member of Al Gore's electronic commerce working group, "People on the Hill are desperate to link their names to anything with an 'e' on it." For Tony Blair, Britain's prime minister, the Internet is crucial to the modernisation of government which he believes must be carried out if non-conservative parties which support the idea of an active state are to have a long-term future. As for the vendors - the big infrastructure and software firms as well as the IT integrators - they keep saying that the Internet changes everything, so they had better believe it themselves.

On the technology front, at least, the Internet, or rather the success of Internet standards and protocols, has indeed changed things a great deal. It is the Internet's open standards, allowing everyone to connect with everyone else, which are the basis of its power. In past government IT projects, special programmes had to be written for every application to make it work with the assortment of hardware and software chugging away in every government department. But today's web applications, often written in the Java programming language, are designed to run straight from the Internet browser.

What is more, virtually all the technologies that will make e-government possible are already working for e-business. For example, applications for enterprise resource planning, customer-relationship management and supply-chain management, business intelligence and data-mining tools, Internet procurement and payment systems are all available now and need very little adaptation for public-sector use. In the same way, the security protocols, the multi-layered firewalls and the public key infrastructures needed for authentication and the protection of data are already available off the shelf. Even the vendors, always keen to offer their own patent solutions, agree that technology is not a barrier to the introduction of e-government.

In the past, government IT projects have been carried through from beginning to end within a single department or agency. That has meant that they have often merely streamlined existing work processes instead of redesigning them or getting rid of them altogether. But just as Internet technologies have forced many big businesses to change what they do as well as the way they do it, so they are about to transform the biggest and most change-resistant business of all - government.

Four far-from-easy steps

The way to e-government divides into four distinct stages. The first stage - which is as far as most governments today have got - involves departments and agencies using the web to post information about themselves for the benefit of citizens and business partners. Thousands of such "one-way" communication sites are already up and running. In the second stage, these sites become tools for two-way communication, allowing citizens to provide new information about themselves - such as a change of address - instead of telephoning or writing. There are also plenty of these around, although many depend on e-mail.

During the third stage, things start to get more interesting. At this point, websites allow a formal, quantifiable exchange of value to take place. It might be renewing a licence, paying a fine or enrolling for an educational course. There are several hundred such sites, mostly operating at the state or local government rather than central government level. More sophisticated versions can guide applicants through making a claim for benefit or filing a tax return. Examples include the Pennsylvania Department of Labour's site and Britain's new Inland Revenue site that went live in April (only to be taken down for repairs a week or so later). Such sites substitute an element of web-based self-service for work previously carried out by public servants, and need to be co-ordinated with offline channels. They begin to challenge traditional working practices and processes.

The final stage, of which more later, is a portal that integrates the complete range of government services, and provides a path to them that is based on need and function, not on department or agency. A

single log-on and password allows users to get in touch with any part of government. Many governments have plans for such portals, but at present only two such sites are anything other than local: MAXI, operated by Australia's state of Victoria, and Singapore's eCitizen Centre.

The British government's experience in preparing to launch its UK Online portal illustrates some of the problems. On the face of it, Britain, with a highly centralised government, a parliamentary democracy and a powerful prime minister who sees himself as a "moderniser", should be well placed to move quickly. Its targets are highly ambitious: 25% of its services are meant to be available online by 2002, and 100% by 2005. But the difficulties are immense. According to Andersen Consulting's Steve Dempsey, nobody has really grasped the extent of the change that is called for or, for that matter, the sheer inefficiency within government that will be exposed by this project.

Mr Dempsey should know: Andersen Consulting has played a pioneering role in the management of big public-service IT projects. Five years ago it won the contract to build a new system for Britain's National Insurance records (NIRS) that eventually went live last year. With 65m National Insurance accounts, more than \$60 billion in contributions and over 100m online transactions each year, not to mention annual changes in the law that affect the whole system, it was a project of huge scale and complexity.

It was also the first big IT project carried out under the Private Finance Initiative, a scheme designed to shift funding and risk to the private sector. In return for designing and building the system, Andersen will receive payments on a per-usage basis for seven years. Although NIRS eventually turned out to be a success, it illustrates the difficulties that bedevil work for the public sector, says Mr Dempsey. "There was simply no partnership with the Department of Social Security, and as a consequence the relationship soured."

UK Online has been split into two projects: one to design and build the site, the other to integrate the systems of all departments to create the single gateway to government that is the point of the portal. The prospect of working on the gateway - likely to be a

£2 billion project - has vendors such as EDS and IBM licking their lips, but there is also trepidation.

Mr Dempsey frets that it is not clear who in government will ultimately be responsible for the project, or how and where it will be funded. The government's "e-envoy", Alex Allan, is based in the Cabinet Office, which has already said that each department should make its own preparations for integration. But somebody should be asking whether all of these departments will still make sense once services are delivered electronically. The Inland Revenue, Britain's tax-collection agency, has proposed that because it is much further down the e-road than any other department, it should make the decisions about vital technical standards that will allow data to be transferred between departments. As a precedent, it can cite Singapore's successful e-Citizen project, which has been led by the Ministry of Finance.

There are other worries too. The government's advisers are quite sensibly thinking about a public-private partnership that would, in effect, create a joint venture. But as IBM's Mr Ramsey points out: "At the end of the day, it's the government that has to control the channel." In other words, unless the government is committed to making the portal its preferred way of doing business, people may not use it.

Keep it bite-sized

Britain's push to turn itself into an e-government has won widespread acclaim. Al Edmonds, the retired American Air Force general who runs the government division of the world's biggest systems integrator, EDS, even describes Britain as "the template" for what other governments, including his own, are trying to do. There is nothing wrong with a project as ambitious as the gateway: Mr Ramsey says that when it comes to e-government portal architecture, "cheap and cheerful won't give you the foundation you need to grow." But the technology firms are saying something else as well: beware of trying to bite off more than you can chew.

Mr Ramsey feels that such projects need to be broken down into smaller segments, for example, getting every agency to agree to use just one system for procurement on the web. Oracle's Jay Nussbaum also warns

against “The Big Bang of trying to do too much too fast.” Mr Nussbaum claims that outlining a vision and strategy is the easy bit. Among other success factors that are needed, he suggests, are a profound understanding of the principles of e-business, and a realistic assessment of the organisation’s readiness for what is about to hit it.

In common with other vendors, Mr Nussbaum also emphasises the importance of scoring some quick wins to boost morale. His highly practical mantra is: “Start small, scale fast, deliver value.” David Kleinberg, a feisty deputy chief financial officer at the US Department of Transportation, who has been working with Oracle to put much of his operation on the web, took on some 20 “IT baronies” within his sprawling department. “By eating a slice at a time,” he says, “they now see the value and they want to play - the costs just come oozing out of the system.”

Britain’s UK Online is much bigger than any integrated portal either running now or coming soon, and some anxiety can be sensed even within the ranks of government evangelists. John Clark of the Cabinet Office’s Performance and Innovation Unit, who is preparing a report on electronic service delivery, reckons that if the portal is to be a success, there is a lot of work to be done that most people in government have not even thought of yet. The big organisational question remains largely unanswered: how do you motivate people to accept massive change in the absence of overwhelming market pressure? Mr Clark concluded a recent presentation with a salutary quote from George Bernard Shaw: “Reformers have the idea that change can be achieved by brute sanity.”

E-government is definitely not for the politically timid or half-hearted. One-stop, non-stop e-government portals will revolutionise not just the way public services are delivered, but government itself as well. The trouble with revolutions is that they rarely go according to plan. They also have a nasty habit of eating their own young.

Quick fixes

IN THE long term, no self-respecting government moderniser would settle for anything less than a fully fledged portal complete with a zappy, citizen-centred interface. But most e-government projects start off much more modestly, as initiatives championed within a particular department or agency. Typically, they go after the things whose transfer to the web can make a noticeable difference without big changes in existing work practices or IT infrastructure. They mostly fall into one of three categories: intranet applications that allow data to be gathered, processed and shared in new, more efficient ways; extranets that link government to business suppliers, bringing discipline and cost savings to procurement; and public websites that give citizens and businesses a self-service channel for their dealings with government.

One example of the first kind is a web-based intranet application developed by EDS for the naval airbase at Corpus Christi in Texas. A large proportion of the helicopters based there, having come into service in the 1960s, were getting increasingly decrepit. Records on the parts most prone to failure and how best to fix them did exist, but in a form that made them almost useless: hand-written paper dockets stowed away in thousands of filing cabinets.

The solution was to take all the old service sheets and scan them into a database that could be searched by serial number or by key word, such as “leaking O-rings”. Now an authorised mechanic anywhere in the world can both enter and retrieve information instantly, so the right spares can be held.

Another example is the work IBM has done with Emekli Sandigi, a Turkish government social-security organisation that collects the premiums and pays the health expenses of 2m public-sector pensioners and their dependants. Previously, pharmacists might have to wait up to two months to be paid for medicines, and had to process 15m prescriptions a year by hand, risking both error and fraud. Emekli Sandigi also

maintains detailed health files on its members that must be regularly and laboriously updated manually.

By linking 17,000 pharmacies together by Internet and intranet, all the information has been brought online. Pharmacists can now check the validity of a customer’s health card, his pay and the latest medicine prices. Not only are health expenses being reduced - the \$8m that the system cost to set up should be recouped in its first full year of operation - but a medical communication network is being built between pharmacies, hospitals and doctors. Repayment to pharmacists now takes less than a week, and customers can use pharmacies anywhere in Turkey.

Electronic procurement is one of the fastest-growing areas of e-business because it can save time and money. The same web-based technologies that are saving firms such as GE and Ford hundreds of millions of dollars could have an even more dramatic effect in the public sector. The state government of Australia’s Victoria has worked with Oracle to improve the purchasing efficiency of its Department of Natural Resources and Environment by 70%. The department has deployed a paperless system with access for 5,000 users that provides complete transparency between vendor and user. Payments are electronic, and fraud is kept down by random sampling. As well as saving money, the department is providing better value thanks to the enforcement of business rules and the accountability inherent in the system. The model is likely to be adopted in government throughout Australia.

The most popular self-service e-government applications that involve transactions of real value with members of the public tend to be web-based systems for paying fines and renewing licences and permits of various kinds. Online payment of taxes is also making rapid headway, although some legitimate concerns about security and authentication remain.

One of the pioneers in using the Internet for tax collection is the Chilean Internal Taxation Service. Its web strategy was introduced in stages but has now come fully on stream, allowing tax returns to be submitted entirely on the web. Citizens can schedule payments, check accuracy and look back over their full tax history. The use

of the electronic system has dramatically reduced not only the time taken over each transaction but also the number of errors made.

If something as complicated as paying income tax can be carried out on a self-service basis, is there any limit? Sceptics think that such sites may not be able to cope with the more complex aspects of benefit and entitlement programmes. But the success of a website designed by EDS for the Pennsylvania Department of Labour to resolve disputed unemployment insurance claims suggests otherwise.

The system, known as EASE (Expert Assistance System for Examiners), is designed to allow people who have been denied benefit after being fired to lodge an appeal. It establishes the exact circumstances of an individual's dismissal and narrows the ground for lawyers to argue over. It works by carefully walking the claimant through a logical series of questions. If he continues to disagree with the department's decision, he still needs to go to court, but the system reduces the scope for legal argument and makes it quicker and cheaper for everyone to resolve their differences.

Public-service innovators all over the world are trying to work out how best to move their services to the web, starting with the easy ones, then graduating to those that will require a lot of reorganisation. Technology vendors, for their part, are creating ever more sophisticated applications to deal with the range of problems that their public-service customers are confronted with. As IBM's Todd Ramsey says: "You start with one set of ideas, but then you go further."

Island site

When it comes to e-government, there is nothing to match Singapore

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FOR a tiny island state with a population of little more than 3m, Singapore takes its defence extremely seriously. A two-year stint in the armed forces is compulsory for every able-bodied male, and after that, every year well into his 50s, he has to report back to his unit for three weeks of military grind. It does not matter whether he is a road sweeper, a teacher or the boss of a bank: he is an "NSman" (National Service man) as well.

Nor does it end there. If you leave the country for more than 24 hours, you must get an exit permit and provide a contact number. And do not forget to submit yourself for regular fitness checks and keep abreast of the latest training requirements. But although boot camp remains painfully physical, much of what goes on between the NSman and MINDEF (Singapore's Ministry of Defence) happens on the web.

The site is both a window on the armed services for the whole Singaporean community (including parents, partners and employers) and the platform for a wide variety of applications for the NSman. He can claim his training pay and get it sent to the right bank account; send information about trips and update it from anywhere in the world; book fitness tests and training courses; shorten the length of training by upgrading his skills through an online military academy; and then tell MINDEF what he thinks of the whole thing in a feedback section.

Access to confidential information, such as medical data, is by PIN number, but families can check dates of events and the whereabouts of recruits. Some sections are already accessible by WAP (wireless application protocol) mobile phone. With such a large and active community, MINDEF's managers are wondering whether to launch into e-commerce: for example, by taking advertisements from private fitness centres and by using the purchasing power of the NS community to get good prices for products and services that may have nothing to do with defence.

Small and rich, with a well-rewarded, entrepreneurial civil service and a political leadership with a liking for big strategies, Singapore is an e-government natural. The IT2000 Masterplan, which has been largely implemented, provided a blueprint for the use of IT in nearly every government department and spawned the Singapore ONE project—a broadband infrastructure of high-capacity networks and switches throughout the "intelligent island". With that foundation, the government is now putting together the ICT21 Masterplan, which will, it gushes, "transform Singapore into a vibrant and dynamic global ICT (information communications technology) capital with a thriving and prosperous net economy by the year 2010."

What is striking about Singapore's approach is that although individual departments are left to innovate in their own way, the big picture is never lost sight of. For example, when MINDEF's IT arm, the Systems and Computer Organisation, launched the world's first Internet-based government procurement system a couple of years ago, it was not long before the Ministry of Finance and the National Computing Board (recently re-christened the Infocomm Development Agency) turned up to see whether it might be extended to the rest of the government service.

The idea—to create a one-stop, round-the-clock centre for the government's business dealings—was christened GeBIZ. The first phase was launched two months ago, and the site should be fully operational by the end of the year. As with other online B2B trading networks, the cost benefits come in the form of more competitive bidding, easy access to suppliers round the world, time saved by online processing of orders, lower stocks and automated collection of high-quality data.

Gee-whizz GeBIZ

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GeBIZ works by allowing the financial systems of ministries and agencies (the usual mix of software from SAP, Oracle and PeopleSoft) and the procurement applications to work together. Trading partners can find invitations to tender and purchase orders on the site. Suppliers can also submit invoices, check payment status, post their catalogues and bid for contracts. For the moment purchases are capped at S\$30,000 (US\$17,341), but

the Ministry of Finance reckons that once new payment and security systems are introduced, 80% of all government procurement will transfer to GeBIZ.

One agency that stands to gain more than most is the Housing and Development Board (HDB), the body responsible for building and administering the estates on which most Singaporeans live. With a budget of nearly S\$1.8 billion a year, it orders the building of new blocks of flats, as well as building and managing over 32,000 commercial and industrial premises.

Under Alex Siow, its chief information officer, HDB has developed a sophisticated information site that gets nearly half a million hits a month. Soon he expects to be able to deal with rent and mortgage payments online, but the biggest gains will come when HDB can conduct its dealings with the construction industry through GeBIZ. "When we do that, we can expect just-in-time contract manufacturing and contract construction," says Mr Siow. The key to this, he believes, is using Singapore ONE to exchange three-dimensional drawings and plans.

But GeBIZ is only one example of Singapore's lead in e-government. In an international survey of sites offering integrated service delivery through the Internet, conducted last year, America's General Services Administration (GSA) concluded: "Singapore's eCitizen centre is the most developed example of integrated service delivery in the world." Launched just over a year ago, eCitizen was one of a series of modernising government projects designed to ensure that the public sector operated, and was seen to operate, as a single entity. This particular project aimed to bring together useful services and to deliver them to Singaporeans in convenient and easily accessible packages.

It quickly became clear that this would best be achieved by creating a single, comprehensive government web portal. This would also help to make Singapore's population more net-minded. As the education minister, Peter Chen, puts it: "The development of electronic public services is critical to setting the pace in proliferating the use of IT and creating an IT-savvy culture in Singapore. It will enhance the ability of the public to be

increasingly familiar and comfortable with IT, which has become a critical component in the knowledge economy. Our people's openness to and skill with IT can offer a distinctive competitive edge to Singapore."

According to the IDA's Tan Sue Hua, one of the eCitizen team leaders, the main reason for the successful launch of the site and its ever-increasing usefulness is the way in which the Ministry of Finance and the IDA have worked together. The IDA has been responsible for the technological side, whereas the ministry has been controlling the purse strings. That has given it the clout to secure top management support and commitment across every government agency. Ms Tan also points out that the technology alone will not get you anywhere: you also have to rethink the processes you are transferring to the web, and make sure that people's attitudes keep up with the changes.

The design of eCitizen allows each agency to keep its own website but to display the content by function, giving users an overall view of the way government works. Information and the opportunity to do business on the site are delivered in one package. To make that possible, all agencies have to adopt a common infrastructure and common modules for things like form-filling, payment and security. And to achieve a single, consistent user interface, they must accept common methodologies.

The user interface the Singaporeans have chosen adopts the metaphor of a citizen journeying through life. As he travels along that road, he can stop at various "towns". Each town groups together a number of service packages that are related to each other. For example, in the Employment Town a visitor can find packages called "Employ People" (for employers), "Look for a Job" (for employees), "Retire from the Workforce", "Upgrade your Skills" and (for foreigners) "Work in Singapore". At present there are nine towns, covering business, defence, education, employment, family, health, housing, law and order, and transport, many of which link the functions of one agency with another. In the Family Town, for example, packages on "Care for the Elderly" come from the Ministry of Health, whereas packages on "Getting Married" are from the Ministry of Community Development.

The Housing Town includes packages on buying and selling flats provided by Mr Siow's HDB. It also has a package called "Move House", complete with electronic application forms for a telephone, utilities, a television licence and parking. Through the same package, a change of address can be sent to every agency that needs to know about it, including the postal service so it can redirect mail. At the Law and Order Town, a report of an incident can be sent to the police, a petition for bankruptcy can be filed and an application made for estate administration by a public trustee.

The next step will be to personalise the transactions so that frequently used services can be reached even more easily and quickly. That does, however, raise one unsettling issue. A site of this kind, which hoovers up a huge amount of data as people transact business on it, can create a centrally held "superfile" of detailed material on every user. This information can be used to improve the level of service further, but it can also be put to less innocent use. The IDA blandly says that information will continue to be protected "in accordance with existing policies", and that individuals must have the right to withhold certain information.

In fact, Singapore's somewhat authoritarian government is probably not too bothered by the threat to privacy or civil liberties. The point of the web is that it is a two-way street. E-governments may be more transparent and accountable than the old-fashioned kind—a risk Singapore seems willing to run—but they will also know far more about their citizens than they do now, and have much more efficient ways of putting to use what they know.

A tool for learning

WHEN he talks about his favourite digital project, Chan Poh Meng, the principal of Singapore's Outram Secondary School, almost wriggles with excitement. Outram, an old neighbourhood school that recently moved to multi-storied new premises in a hilly district of the city, was chosen last year to pilot the Learning Village, a joint venture between Singapore's Ministry of Education and IBM.

Mr Chan's enthusiasm is understandable. The project goes to the heart of Singapore's education policy of using the Internet to make schools more outward-looking and collaborative. "Schools can become like cocoons," says Mr Chan, "but they can't remain isolated, they must reach out." That is the idea behind the Learning Village. It is a web-based platform combining a set of Internet applications to allow communication and collaboration both within the school and beyond it, involving parents and other interested members of the local community with the school and its activities.

Parents are given passwords for logging in to the site from their homes and offices. Once there, they can go to the events calendar to check the whereabouts of their children, or visit teachers' home pages to get information about their teaching methods, grades achieved in class, assignments, homework and lessons for independent study. Parents can also participate in online "meetings" with teachers, and follow their children's online discussions. For their part, parents can offer their ideas for the school's development and influence its policies. Mr Chan recently used the site to solicit views about the school's opening hours. He is also keen to use a "private conference" application to discuss individual children's problems online.

Teachers and pupils benefit from the online bulletin board, which cuts down on the need for time-consuming assemblies and administrative meetings. In a "Teachers' Lounge", teachers can share ideas about lessons and discuss the effectiveness of teaching strategies. There is also a suggestions box for the principal. Pupils can use the site to work together on projects, not just with each other, but with

counterparts in other schools, even other countries. Official "mentors" who may have some special expertise or experience to contribute to the school can do so from anywhere in the world. Recently, a class was able to put questions to a mountaineer climbing Everest.

Mr Chan believes that what makes the Learning Village so valuable is its openness—which only the public Internet, as opposed to a special schools intranet, can deliver. It offers parents the opportunity for day-to-day involvement instead of just the odd visit to the school at some critical time in their child's career. He says this transparency is not only profoundly challenging for teachers, but also makes parents rethink their commitment to their child's education.

His main concern is to increase the number of parents using the site. Although Outram's parents tend to have lower-than-average incomes, about 40% have access to the Internet from home, but fewer than 20% have applied for a password. This being Singapore, though, they are not being let off the hook. Mr Chan is bringing them in for training sessions of two hours for groups of 30 at a time.

Other schools in Singapore are keen to follow Outram's example. In January, 40 principals met to hear about Mr Chan's experience. One obstacle may be cost. IBM charges a subscription of S\$2.80 per student per month to cover the cost of the software and of hosting the site, though it makes little or no money out of it. With a school the size of Outram, that works out at around S\$40,000 a year. The Ministry of Education's director of education technology, Tam Yap Kwang, says it will be three to five years before the Learning Village can be extended to all the schools that want it, but he may be being too pessimistic.

Whatever the time scale, it seems likely that schools in poorer areas will get priority. The ministry has a policy of aiming the bulk of its IT spending at less able and less privileged children. Mr Tam says that, in the past, most of these children would have dropped out of school at the earliest opportunity, but give them access to a PC and the Internet and they will stay in school. If they want to upgrade their skills later, they will also be far better equipped

to take advantage of the many online courses to be found in "Education Town" on the eCitizen site.

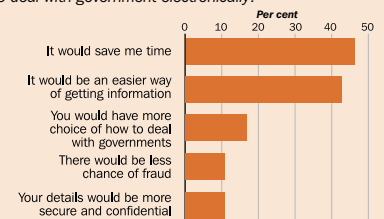
Haves and have-nots

How to overcome the digital divide

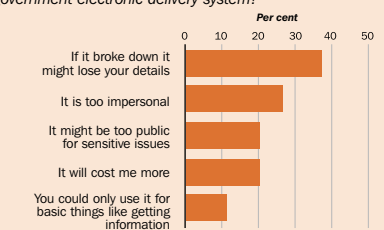
E-GOVERNMENT is not just e-business on a larger scale. One of the most fundamental differences is that whereas businesses can, by and large, choose their customers, government cannot. The debate over the so-called "digital divide" is like the ghost at the e-government feast. For e-government to succeed fully, the dream of Internet access for all has to become a reality.

Pros and cons

What, if anything, would be the benefits of being able to deal with government electronically?



What, if anything, would be the barriers to use of a government electronic delivery system?



Source: Performance and Innovation Unit, Cabinet Office/MORI Sept 98

Governments are well aware that large and expensive e-projects will command little support if only a privileged minority benefits. As David Agnew of the Toronto-based Governance in the Digital Economy Project, which is supported by eight big IT firms and 20 national and local governments, argues: "If putting government online is just a way of reinforcing access for people who probably already have more opportunity to access government and decision-makers, then it hasn't really been much of an advance after all."

When Arizona's Democrats held their state presidential primary online in March, it nearly did not happen—not because of security and authentication problems

(although there were plenty of those), but because a pressure group called the Voting Integrity Project tried to have it banned. It almost persuaded a court that the vote would disenfranchise the state's minorities, so should be ruled illegal.

Raise the spectre of the digital divide with the technology vendors and e-government champions within the public sector, and their brows furrow with concern—but not for long. They are, after all, professional technology optimists. But they also genuinely believe that many of the barriers to near-universal Internet access are falling, at least in economically advanced countries (though it is worth remembering that half the world has never even made a telephone call). Survey after survey has found that the main barriers to access are the fear that it is too expensive, that computers are too complicated and that somehow the whole thing is not really relevant or useful. Those optimists argue that, one by one, each of those perfectly legitimate anxieties is being overcome.

What's the problem?

Too expensive? Internet-ready PCs can be bought for little more than \$300—less than the price of most televisions, a device that has found its way into 99% of all American homes. Some Internet service providers (ISPs) are even giving PCs away in return for two or three years' subscription, and other firms offer free PCs to users who agree to be bombarded by advertisements while online. True, access fees and telephone call charges remain high in some countries, but unmetered local calls are spreading from America to Europe, and free ISPs are evolving a range of different business models.

Too complicated and unreliable? That will soon be fixed by the proliferation of non-PC devices which provide access to the web. Among them will be simple terminals that do nothing more than run a browser and take all their applications from the web. These will be found in places such as schools, community centres, libraries and anywhere else that needs a robust machine and has an "always on" connection. An even simpler version is the kind of web kiosk with a touch-screen that is springing up in cities such as Singapore and Toronto.

Many people will be able to do as much business as they need over the Internet with inexpensive smart mobile phones, some of which will soon take the form of a wrist-watch that can be activated by speech rather than via a fiddly keypad. Many new mobile phones are already being loaded with WAP software and microbrowsers. Another way of getting online is by interactive digital television. Early services, such as BSkyB's Open in Britain, are still clunky, but the technology will improve, and the set-top box decoders will often come free.

The more extreme technology optimists, such as Adam Thierer of the conservative Heritage Foundation in Washington DC, say that the rapidly falling price of both computing power and bandwidth will in fact create a "digital deluge", so any policies aimed at giving access to the "information-poor" are quite unnecessary and may be counter-productive. It is a comforting view, but probably quite wrong.

The latest release of the US Department of Commerce's survey "Falling Through the Net" paints a disturbing picture in which the digital divide between rich and poor, white and non-white, well-educated and under-schooled seems, if anything, to have widened significantly during the five years in which this information has been collected. Among the examples of the digital divide today, the survey found that:

- @ People with a college degree are eight times more likely to have a PC at home and 16 times more likely to have Internet access at home than those with an elementary school education.
- @ A high-income household in an urban area is 20 times more likely to have Internet access than a rural, low-income household.
- @ A child in a low-income white family is three times more likely to have Internet access than a child in a comparable black family, and four times more likely than if he were Hispanic.
- @ A wealthy household of Asian descent is 34 times more likely to have Internet access than a poor black household.

@ A child in a two-parent white household is twice as likely to have Internet access as a child in a single-parent household. If the child is black, he is four times more likely to have Internet access than his single-parent counterpart.

@ Disabled people are nearly three times less likely to have home access to the Internet than people without disabilities.

In other words, although Internet penetration has risen across all demographic groups, the digital divide remains only too real. It has also become a poignant proxy for almost every other kind of disadvantage and inequality in society.

Chalk and cheese

It would be hard to find a better real-life symbol for the digital divide than the gulf between Silicon Valley's leafy Palo Alto, home to dot.com millionaires, where the average house sells for nearly \$700,000, and East Palo Alto, the desperate little town on the other side of Highway 101 that not long ago claimed America's highest murder rate. Palo Alto's website has 251 sections and is a paragon of e-government. Among many other things, it allows users to send forms to the planning department and search the city's library catalogue. During storms, it even provides live video footage of flood-prone San Francisco Creek. East Palo Alto's site, by contrast, has only three pages, containing little more than outdated population figures and the address of City Hall.

The digital divide is not so much a question of access but of education. As Esther Dyson, an Internet pundit, puts it: "You can put computers in community centres, but only the literate people are likely to go use them." Simpler, cheaper ways of getting on to the web will help, as will content that seems relevant to those who shun the Internet today—after all, the mobile phone has conquered all social classes, thanks to its sheer usefulness and simplicity. But even with enlightened policies such as America's "e-rate", which gives cut-price web access to schools and libraries, and the growing number of private-public partnerships to spread both technology and training in its use, there is a danger that the "digital deluge" may reach only those

parts where the grass is already green. The same people who have wired PCs today will collect all the fancy new web gadgets that are coming in, and the rest will continue to go without.

So what does this mean for e-government architects? First, as IBM's Todd Ramsey points out, they have to accept that some people, especially the elderly, will never want to deal with government—or indeed anyone else—online. That means some off-line channels will almost certainly have to be kept open for years after everything has moved on to the web. Second, they must find ways to allow even those diehards to benefit from the e-government transformation by improving the quality of the off-line channels and targeting them better. Not all the savings from electronic service delivery will be bankable.

Third, they need to think up incentives for those on the wrong side of the digital divide to take the leap. Government may be able to act as a catalyst in a way that the private sector cannot. What persuades most people to try the Internet is the promise that they will find something relevant to them. If the most convenient way of getting welfare benefits is online, a lot of people who had never thought of using the web will have a go.

Sign on the dot.com line

Paying fines or fees online is a lot more convenient

KALEIL TUZMAN says it was his discovery of a two-year-old unpaid parking ticket while moving house in 1998 that prompted him to start govWorks. How convenient it would be, thought Mr Tuzman, if he could pay the fine online. The end result of that reflection was a firm which uses the Internet to let people make all kinds of routine payments to local government - not just in one municipality, but potentially across America.

The business logic was simple. The United States alone has more than 80,000 local authorities which between them collect around \$450 billion a year in fines and

fees for things like building permits and business licences. If taxes are included, the figure rises to about \$4 trillion.

Most of them post some information on the web, but very few as yet offer facilities for the public to do business with them that way. The standard method is still by mail or, if you can ever get through to the right person, the telephone. With limited funding for new IT initiatives and the skilled staff that would be needed for them, Mr Tuzman reckoned there was an opportunity for a web-based "infomediary" to pull all the pieces together. GovWorks would get its money partly from a convenience fee it would charge users for its service, and partly from a share of the savings made by the local authorities.

GovWorks, launched six months ago with \$19m of venture capital, claims to be able to process credit-card payments of fines, local taxes, permits and utility bills for 3,600 municipalities. Its site is a portal designed to provide a friendly interface between citizens and bureaucrats. Its features include discounts on payments through its "govRewards" loyalty scheme, information about jobs, a who's who of officials, auction listings, bulletin boards and chat forums to encourage civic debate, among other things. Job advertising and hosting online government auctions are expected to provide additional revenue in future. To add a feelgood element, govWorks has promised to reinvest a portion of all these earnings in free PCs and pre-paid Internet access for schools, libraries and community centres. "It's all part of our effort to help bridge the digital divide," it claims with a hint of smugness.

Great minds think alike

It would be surprising if govWorks had such a potentially lucrative field to itself, and indeed several other well-financed competitors have emerged at about the same time. Some of them, such as PayTheTicket.com and Official Payments Corp, simply offer a payments service. Others concentrate on just one aspect of the government-to-business relationship. For example, Accela.com issues building permits, in the hope that this will bring traffic to its construction e-marketplace. Another firm, the National Information Consortium, offers a turnkey solution to

governments, designing, building and operating Internet portals for 11 states, from Hawaii to Maine. NIC's proprietary technology provides access to many previously unconnected databases, saving its customers' time. Most of its earnings come from fee-sharing arrangements. Govhost.com is a systems integrator for local-government services. Giants such as IBM, EDS, Oracle and the big five consulting firms either collaborate or compete with e-government specialists in building and hosting sites.

GovWorks' closest rival is ezgov.com, an Atlanta-based start-up that launched its website a month before govWorks. It boasts Mario Cuomo, a former governor of New York, and Jack Kemp, a former congressman, among its directors. In March it tied up \$28m of second-round funding. The main difference between the two is that ezgov.com aims to establish a deeper partnership more slowly by partly integrating its activities with the back offices of the government department concerned.

Each of the two firms has launched spirited attacks against the other. Bryan Mundy, the chairman and co-founder of ezgov.com, is particularly resentful of govWorks' claim to have been first in the field. He suggests that his rivals have hijacked his business model, and accuses them of being "a bunch of investment bankers" who lack the passion to make a difference. But this will not be a winner-takes-all market. Joe Landy of Warburg Pincus says that because government in America is so decentralised, "there's plenty of space here for a lot of winners." He is probably right. Nevertheless, a recent report by Forrester Research gives warning that this market will take time to develop. The problem, says one of the report's authors, Jeremy Sharrard, is that the contestants' "success is linked to outgunned, undermanned local governments, and as a result implementation will prove more difficult than expected." In order to move online quickly, he argues, governments often stop short of full integration, which makes their sites less convenient to use.

GovWorks, for example, does not connect to most of the governments it does business with, so payments made through the site can take up to seven days to reach their destination - about the same time as

using the mail. Even ezgov.com, which does link into governments, usually processes information in batches only once a day - adequate for most things, but a far cry from the real-time efficiency of the best commercial e-tailing sites. Forrester also doubts that revenue will grow fast enough to finance traditional dot.com advertising sprees, so awareness of the sites may grow only slowly.

That said, Forrester believes the very existence of these sites will create consumer demand and put further pressure on governments to invest in improving them. Technology, especially data standards such as XML, will evolve to make the job easier, allowing the way services are delivered to be standardised, wherever they are based.

When that point is reached, government's present way of doing things will be challenged. Within America, the range of services that local government delivers is much the same, so as they move to the web, those services are bound to be commoditised. Firms such as ezgov.com will be able to do everything that today's bureaucracy can do. Unless it can respond creatively, local government in America, and many other parts of the world, may lose at least some of its *raison d'être*. Who said governments can't be "Amazoned"?

A local site for local people

THREE years ago, the people of Spain's Valencia region were rather behind with their computing skills and Internet experience. It was one of the things that put off would-be investors in the area. But today, thanks to a project called "Infoville", Valencia is on the way to becoming one of Europe's first "smart communities".

The government of Valencia, working with Oracle, a software and consulting firm, conceived Infoville not just as a local government website, but as a portal that would combine a broad range of services from both the public and the private sector. Juan Rada, who heads Oracle's service-industries practice in Europe, says that Infoville is a kind of local information utility which integrates e-commerce, e-government, online learning and virtual governance.

As well as dealing with government departments such as housing and tax-collection agencies, the portal also provides access to utilities, local bank accounts, schools, doctors' surgeries, garages, restaurants and retailers. With more than 260 services now available through the site, it is a little like an interactive version of the yellow pages. New services can easily be added, and will benefit from its centralised arrangements for administration and billing at virtually no cost to themselves.

Infoville was designed to be relevant to its users' daily lives, and to be simple enough for even the most technophobic to handle. To encourage its use, it was made accessible in a variety of ways: through not only PCs, but also kiosks in public places, as well as digital interactive television. The 100,000 citizens who are involved in the pilot were chosen as a representative sample of the population at large.

To disarm critics, Mr Rada makes a simple point: most of the activities people engage in take place within their local community. For example, 90% of telephone calls are local. He calculates that up to 80% of the information carried on a site such as Infoville is unique to the region. The pilot has been so successful that similar services will soon be launched in 35 more Spanish cities.

Another European city that set out to become a "smart community" was Naestved in Denmark. It was faced with a decline in traditional industries such as paper, steel and timber and had trouble attracting new ones because it is by-passed by main road and rail links, even though it is only an hour's drive from Copenhagen. To overcome that disadvantage, it built itself a world-class IT infrastructure based on high-speed cable and set about integrating Internet technologies into every aspect of local society—private, public and commercial.

One result is NaestvedNet, an Internet database that provides access to all regional services from a single site. Users can choose from, among other things, council services, traffic information, an interactive local phone book, a complete local business directory, tele-education, an electronic map, banking and online local shopping. A digital signature can be

obtained by anyone who wants it, and so far about 20% of the population have got one. Herman Weidermann, the municipal director, says that digital signatures give citizens access to their own files and allow them to perform legal transactions over the net, despite Denmark's draconian data-transfer laws.

The mayor of Naestved, Henning Jensen, thinks that concerns about the digital divide are overdone. But to make doubly sure, six open data centres have been set up across the city to provide free PC and Internet access, as well as a distributed learning network for training and computing skills. Working with IBM, Naestved has set up a single basic system to meet the needs of government employees, citizens and private firms alike.

Neither Naestved nor Valencia have found it cheap to build their smart communities, but Oracle's Mr Rada says the costs have to be put into perspective. The cost of launching Infoville, he points out, has been about the same as building a single kilometre of motorway. If that seems too expensive, he says, Oracle offers to put up the money in return for a share of advertising or transaction revenue. "Don't invest—if you give us the site traffic, we will build a local information utility for you."

Digital democracy

Stand by for online voting, and more

IN THE 48 hours after winning the Republican primary in New Hampshire, John McCain raised \$1m in campaign funding through his official website. The donations were made by credit card and averaged \$110. He subsequently amassed a further \$6m online, but even that was not enough to stave off defeat at the hands of a well-dug-in party organisation that had already committed itself to George W. Bush. Still, Mr McCain's use of the web to raise funds as well as to organise grassroots volunteers was not lost on the political establishment.

To date, fewer than 14m Americans have ever used their credit cards for an online transaction, but as that number surges over the next few years, candidates will be able to use the web to go straight to the voters'

wallets. The traditional party machines will increasingly find themselves disintermediated.

Inevitably, much of e-government is about the delivery of services and the government's dealings with the private sector. But there is another dimension to it. This is how David Agnew, the executive director of the Governance in the Digital Economy programme in Toronto, describes it: "You can't build a fence around the citizen as simply a consumer or customer of government services. That same citizen is also an owner or shareholder of government itself. In the digital age, people have an ability to communicate, to participate and add value."

Mr Agnew believes that just as the Internet has helped to empower a new generation of well-informed and demanding consumers, it will challenge the essentially passive relationship that the majority of people have with government and politics. Just as consumers at first used the web to gather information and only later took the plunge by buying things online, in due course citizens will move from using the web to communicate with government to expecting to be able to cast online votes in a national election.

President Clinton acknowledged as much last Christmas when he launched a number of initiatives under the broad heading of "e-society"—including a feasibility study into the introduction of online voting described by White House insiders as "very serious". There is support for online voting in Europe too. An e-mail survey of 500 elected officials in 14 countries last year showed that more than half would back the introduction of online voting as long as traditional channels remained in place.

How soon online voting will become routine is hard to say. Experiments at the local level, such as the Arizona Democratic primary in March, when 40,000 people voted via the web (a 600% increase in turnout over the election of 1996), will proliferate in both America and Europe as governments learn how to run cyberpolls.

When Arizona's Democrats held their now famous election, state officials from all over America went to Phoenix to learn from the experiment and to quiz the firm that conducted the poll, election.com. Although those involved declared it a huge success, there were enough hitches to give pause for thought. The voting site went down for an hour on the first day of voting; some voters lost the PIN number that had earlier been e-mailed to them; and the helpline could not handle the volume of calls from all the people having problems. Users of Apple Macintosh computers encountered particular difficulties.

Thomas Wilkey of the New York State Board of Elections was unimpressed: "I call it chaos." Alfie Charles, the assistant secretary of state in California, agreed that breakdowns of any kind were unacceptable during an election, and added that before Internet voting systems could be certified, state authorities would have to be confident about the strength of encryption systems and the overall reliability of the software. "It just shows the need to take a cautious, incremental approach," he said.

Theo Dolan of Forrester Research echoes that sentiment, arguing that essential requirements are likely to include mass voter authentication, online databases with accurate, up-to-date electoral rolls, and voting sites that can withstand concerted hacker attacks.

How universal?

But the biggest uncertainty surrounds the digital divide. Some argue that as long as Internet access is so heavily weighted towards the better off, online voting will inevitably weaken the voice of the poor and of ethnic minorities still further. Others, such as Reed Hundt, the former chairman of the Federal Communications Commission, think that it will encourage voter registration, especially among the young. Opponents may find it hard to argue against something that could help to make America's voters less apathetic (only 49% bothered to vote in the 1996 presidential election).

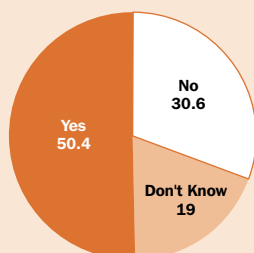
Still, there is more to e-politics and digital democracy than online voting, says Janet Caldwell, the director of the IBM-funded Institute for Electronic Government in Washington, DC. Ms Caldwell defines digital democracy as any electronic exchange in the democratic process. As well as online voting, digital democracy includes a number of things that are already gaining ground: campaigning and fund-raising, as demonstrated by Mr McCain; voter registration (so far 1m American voters have registered online, and the number could reach 5m by November if the service is offered by portals such as Yahoo!); opinion polling; communication between representatives and voters; wired legislative bodies (such as Wisconsin's state assembly and Belgium's parliament); and feedback from the public on legislative drafts.

If some governments are tempted to drag their feet over digital democracy, they will find that a plethora of commercial e-politics sites has stirred interest among both candidates and voters. PoliticsOnline provides news and webcasts of campaigns, but also sells Internet tools and software to candidates and campaign managers who want to build a site for fund-raising. One of the PoliticsOnline offerings is "Instant Online Fundraiser v2.0—your Internet fundraising solution."

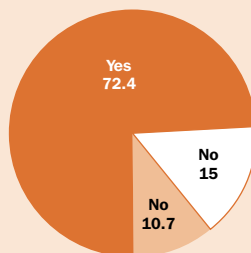
New York-based election.com, the company that ran and hosted the Arizona primary, claims to have conducted hundreds of elections in both the public and the private sector around the world. It promises a seamless migration path from the traditional, paper-based election process to

Virtual votes A survey of elected officials from 14 European countries, 1999, % of total*

Would you support the introduction of online voting?



Do you believe that information technology can enhance democracy?



Source: Institute for Electronic Government

*436 responses

the Internet.” Its latest project is the Youth-e-Vote, a nationwide exercise in online voting for students.

The brilliantly named E The People describes itself as “America’s Interactive Town Hall”. It offers a service processing traffic-violation fines, but its main activity is running online petitions on almost any subject, from “Stop Kent State Primate Research” to “Equal Rights for Children of Second Families” and “Impeach Mayor Penelas”. Other participatory sites include Voter.com and Grassroots.com. Voters who find it hard to make up their minds can try CandidateCompare.com and SelectSmart, which will identify the candidates whose policies and prejudices most closely match those of the inquirer.

Some hope that this could one day lead to the kind of electronic direct democracy once advocated by Ross Perrot, the founder of EDS and maverick presidential candidate. But the unbridled populism that might be released is something that makes most e-government enthusiasts recoil. The aim, they say, is to work with the grain of the representative institutions we already have, not replace them with something so scarily unpredictable. They prefer to think of the rekindling of Jeffersonian democracy by electronic means. As David Agnew says: “In many countries, democracy is showing signs of fraying round the edges. We’ve seen not just lower participation rates in elections, but also a lower commitment to the political process and lower trust in government. Thoughtful governments are looking at the Internet not as a threat, but as a positive potential tool to re-engage the citizenry in the business of governing.”

Perhaps. But Jeffersonian democracy was, in practice, democracy by and for an elite. Unless great care is taken, digital democracy could turn out to be something similar—providing simply a better way for political activists to be politically active.

Handle with care

E-government is mostly a good thing, but it needs watching

WHEN Intel’s Andy Grove declared last year that all businesses would have to become e-businesses soon if they wanted to survive, few people disagreed. The fear of new Internet-borne competitors and the sudden transformation of old rivals was almost palpable. Many businessmen were also excited about innovative business models that seemed to dazzle investors. E-government is not driven by such extremes of fear and greed as e-business, but the rewards for success and the penalties of failure are nevertheless real. So what should governments do to prepare?

The first thing they need to do is hurry up. If they are not already well on the road to e-government, they should start at once, or other countries and regions will make them look like laggards. Governments form such a crucial part of the business environment that, when all else is equal, firms and skilled people may prefer to go where the benefits of e-government are available. Not only are e-governments far more efficient than the old-fashioned variety, they are also easier to deal with and better liked by their citizens.

At a minimum, e-government might consist of nothing more than filling in a few forms on the web. But to move from there to a fully fledged e-government requires profound changes in the culture, the processes and the relationships that define government as an entity. Would-be e-governments need to adopt a four-pronged strategy.

- @ The first prong is the establishment of a secure government intranet and central database that reaches across all departments and enables them to work together. The intranet must also have resilient, high-capacity interfaces with public-sector agencies and local and regional government bodies.
- @ The second is the delivery of services that are tailored to the needs of citizens, and are accessible via the web in a convenient and secure form. The

aim should be to provide a one-stop portal that is always open and caters for all aspects of the relationship between government and citizen.

- @ The third is the creation of a government e-marketplace where departments can advertise their requirements, authorised suppliers can bid and post tenders for high-value purchases and public servants can purchase low-value goods quickly, efficiently and at centrally negotiated prices.
- @ The final prong is digital democracy. Governments and politicians must use the web to make themselves more transparent and accountable to the voters, evolve new methods of consultation and eventually offer online voting.

Implementing e-government is complex and will require not only vision, but also strong political leadership at the highest level. Prime ministers and presidents do not need to know how to write Java code, but they must have the basic familiarity with technology that comes from using computers and the Internet in their daily lives. Bosses whose idea of using e-mail is to get their assistants to provide printouts are ill-equipped to lead the transformation of their firms into e-businesses. They do not know the right questions to ask, and lack credibility with employees. The same applies to senior politicians.

Leadership also means that a team has to be put in place within government that has the political clout and the funding to knock departmental heads together, rethink current working practices and impose technology standards. Britain has made a start by appointing an impressive-sounding “e-envoy”, Alex Allan. He leads a group of 35 senior officials representing the departments and agencies involved, who optimistically call themselves “The Information Age Government Champions”. But the minister responsible, Ian McCartney, attached to an all-purpose department called the Cabinet Office, is rather junior, which raises doubts about the outfit’s effectiveness. Singapore, by contrast, has given the job to its Ministry of Finance and the IDA, the agency responsible for IT and communications policy, both of which carry plenty of clout.

Keep it simple

So where should governments start? An e-government portal can operate on three levels of complexity: first, publishing information and providing links to existing departmental websites; second, establishing a two-way channel for dealing with individual agencies; and third, doing business involving multiple agencies. The best starting point may be to get a fairly simple portal up and running and then add more functions in stages as progress allows. An over-ambitious site that loads pages slowly and fails to deliver on its promise to work across departments and agencies will put users off.

Governments would also be well advised not to get carried away with the technology, but to stick to established Internet standards and protocols and to use tried-and-tested packaged applications with as little customisation as possible. Much of what they should aim for sounds obvious: a flexible technology infrastructure that can easily adapt to different amounts of traffic (because successful central government portals are bound to be busy, with unpredictable peaks); a single interface that provides a consistent look and feel for its users; straightforward search and navigation; the widest possible range of getting access to the system, from PC browsers to WAP phones and digital television; and the provision of links between online services and telephone call centres, because many people will still prefer to use the phone to deal with government departments and agencies.

E-government projects offer great opportunities for establishing new partnerships with the private sector, for example by developing new funding models and sharing risk with technology vendors. Each government will have to decide for itself how far it wants to go in allowing the private sector to supply public services and to package these with commercial services. But, leaving funding to one side, arrangements of this kind will be essential to bridge a growing skills gap, because the public sector is finding it ever more difficult to attract scarce IT professionals. Careful thought must be given to the regulatory framework for such partnerships. Typically, problems will arise about the way licences are awarded, and over what periods; fair

treatment for governments' other commercial partners; and the safeguarding of citizens' privacy.

Privacy and security is a hugely important aspect of successful e-government. By giving every citizen a digital signature and maintaining the highest standards of data and privacy protection in its electronic transactions, e-governments will not only increase confidence in the Internet delivery of their own services, but will also provide a stimulus to e-commerce throughout the economy. If they fall down on the job, they risk a damaging erosion of trust. As more and more detailed information about individuals is gathered electronically and passed between agencies, e-governments will also have to allay citizens' understandable fears that Big Brother is snooping on them in cyberspace.

Another serious concern is the digital divide, which carries the threat that the least well-off may not have access to the system. At first sight, this suggests that governments should move more slowly, but an even better case can be made for the opposite policy. Because all citizens have to deal with government, whether they like it or not, e-governments can provide incentives for them to make the web their preferred channel for such transactions, thus spurring the adoption of the Internet. In the same way, governments can encourage small businesses that want to supply them to get on to the web.

Fully fledged e-government will be neither quick nor easy to achieve—despite the sometimes extravagant promises of cyber zealots and politicians alike. In that respect, the rules for e-government are different from those for e-business, where it may sometimes be better to be fast than right. Governments have to be more cautious, they must take more care to take people with them, they are more accountable for the money they spend, and the sheer size of their operations dwarfs all but the biggest global companies. That said, for the first time since the establishment of the modern welfare state, there is now a real chance to “re-invent” government—and make it a great deal better.

For tomorrow's e-citizens and e-businesses, the coming e-government revolution is almost wholly good news. It offers the

potential for services that are designed for citizens' needs, and available when and how they want them; lower taxes, as increased efficiency cuts the cost of government; more transparent ways of doing business with the different arms of government; a two-way street of consultation and collaboration; a new level of accountability for both elected and unelected officials; and more open and responsive politics.

The one important reservation is that vastly more efficient governments will also know vastly more about each and every one of their citizens. The exponential increase in the ability of e-governments to gather, store and mine data about people will raise well-founded worries about privacy and civil liberties. The price of happy e-citizenship will be eternal vigilance.