# Report of the Ad Hoc Group of Experts Meeting

# "New ICT and E-Government"

Mexico City, 5-6 November 2003



**United Nations** 

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# Department of Economic and Social Affairs

Division for Public Administration and Development Management

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# **INTRODUCTION**

The Capacity Building Workshop on "New ICT and E-government" was organized as an integral part of the 5<sup>th</sup> Global Forum on Reinventing the Government in Mexico City. At the same time, it must be seen in two other contexts.

Formally, it represented also the Ad Hoc Group of Experts Meeting, a mandated UNDESA activity. We have decided to bring the experts to the Forum to expose more people to their views, and at the same time, to enrich the discussion by voices of many more participants than we would have gathered, if we stayed with the Meeting at the UN Headquarters in New York. Indeed, in each of all three sessions approximately 250 people participated from all over the world and the experience and insights that they brought added great value to the whole event.

It is noteworthy, that in the time leading to the Workshop, UNDESA has solicited through the <u>www.unpan.org</u>, the UNPAN website, self-nominations of qualified participants to be sponsored by UNDESA. From over 50 self-nominations, 21 participants were chosen and invited. (See Annex 2.) This has been an innovative for UNDESA way of choosing sponsored participants. It allowed us to bring on board great cross-section of professionals. This would have been most difficult to achieve by any other means.

The second context for the Workshop was provided by the <u>World Public Sector Report 2003: "E-government at the crossroads".</u> The main message of the Report is that e-government applications are meaningful only if they follow and support transformation and change in public administration that is aimed at securing human development. This seemingly leaves little space for deliberations about the impact of new ICT solutions on e-government. If one follows the logic of the Report, they should not matter much or at all. Yet, an important question remains: we would not be talking about e-government at all, if not for the technical opportunities offered by the ICT sector. Therefore, with the quick pace of technological development, checking the validity of these assumptions in the circle of professionals dealing with ICT development and developers of e-government applications seemed very needed. Their interaction was structured around identification of the possible impact of further progress in ICT development on removing obstacles in successful deployment of e-government.

The Workshop has reconfirmed the existence of some the major obstacles to successful deployment of egovernment. To wit:

- Shortage of good, participatory governance that too often results in a weak link between people's preferences and the focus of e-government applications;
- Lack of sufficient change and transformation on the government side that puts ICT in the environment of embedded goals and action patterns and makes it less effective;
- Lack of holistic development strategies that would provide employment and training options for civil servants that might be displaced by automation of public services;
- Digital divide: low levels of affordable connectivity, tele-density and computer penetration; low levels of skills, including change management, project management, business as well as information/knowledge society skills;
- Digital divide between e-government developers and the rest of the civil service;
- Low levels of coordination and collaboration within the public administration;
- Low levels of trust in or utilization of on-line services;
- Regulatory/legislative barriers, including on-line security and privacy protection;

- The barrier of public or private monopoly for telecommunication services;
- Budgetary barriers;
- Few common technical frameworks and infrastructure, including low inter-connectivity of existing information networks, e.g., between public and private sector;
- Weak frameworks for monitoring and evaluation of e-government development;

The Workshop has formulated also an optimistic message concerning ICT, its current and future development and capacities. The affordability of connectivity is increasing and this trend will continue as a result of progress *inter alia* in wireless technologies, de-scrambling of the PC technology, grid computing, interactive TV and a shift from device-centric computing to information-centric computing. Technical ways already exist to provide for instance high-level on-line security guarantees as well as ICT system management for content availability, quick response, infrastructure expansion and complex infrastructure administration. If anything, in the future e-government development, technology should not be a problem. On the contrary, availability of flexible, more powerful technological solutions may increase the pressure on governments to utilize their full potential, i.e. transform and change in order to create space for imaginative ICT applications in government operations.

One barrier to the use of these technologies is the corporate behavior, though big vendors seem to evolve in their approach to the e-government market by increasing their stake in eventual successful application of the products they offer. Such evolution is indispensable.

Another barrier is the lack of interest to explore and invest in intermediate technologies that bring ICT solutions, but at lower cost and with the use of mixed technology applications.

However, a far greater barrier seems to be on the public administration side. In order to expand the optimistic ICT-rooted message to e-government deployment in general, the Workshop has seen the need for the following:

- 1. Governments should draw practical conclusions from the fact the e-government is a tool, not an aim in its own right and focus on producing increasing amounts of public value, things that people want, with or without the help of ICT applications. It is an excellent government that is wanted, not ICT applied in the hope that it will somehow improve the government. Specifically, local initiative and creativity in producing public value would best inform decisions about using ICT in public administration. This use may include but must not be equated with computer-supported access to the Internet. Knowledge of local conditions and needs promises the most economical and most adequate application of ICT at any level of public administration. This would assume though even-handed approach to bridging the digital divide within countries and communities as well as devolution of power and resources from the central level that would combine an increase of local responsibilities with an increase of local access to financial, human, information and technical resources. This is especially important in case of ethnical minority and indigenous communities.
- 2. Governments should explore the relationship between e-government and preferences of the people. Actually this boils down to new governance models. For instance, while the importance of leadership and vision in e-government development is crucial, there is a fine line that divides the indispensable leadership in actual e-government implementation and deciding for the people what their preferences are. Crossing this line often produces e-government applications that are pointless and wasteful. Respecting this line would require major changes and transformations in governance structures to allow genuine participation, or, in other words, moving form the age of connectivity to the age of participation. Use of ICT to support citizen development looks like the

direction to follow in future. The currently somewhat separate worlds of the political leaders, egovernment developers and the public at large must be brought together and a common, transparent platform for e-government development, but also its measurement, monitoring and evaluation must be established.

- 3. In the same spirit, governments should explore the relationship between e-government and development policy. The broader framework of development strategy, its goals and social targets must inform e-government development. Especially, whenever the development policy adopts the goal of human development or high quality of life for all citizens, e-government deployment must be based on benchmarks that relate to building human capabilities in areas crucial to human well being in a given developmental context. In vast majority of the development situations today, these benchmarks would measure the impact of e-government applications *inter alia* on removal of poverty, removal of inadequate education and skills, removal of inadequate healthcare, removal of deficit of jobs and unliveable income, on strengthening the protection of human rights and freedoms, on uprooting intolerance and discrimination. New applied philosophy of development is needed. Eventually, e-government must be about hope and opportunity.
- 4. Furthermore, governments should explore the relationship between e-government and indigenous cultures and languages. E-government must validate cultural diversity and avoid suppressing it in the name of ill-conceived modernity.
- 5. Governments must also explore the relationship between e-government and structures of public administration, as we know them today. The limits of digitizing the administrative *status quo* have been about reached in most countries advanced in e-government development and this path should be avoided by countries that consider advancing e-government deployment. Change and transformation in structures and operating procedures of public administration loom as indispensable conditions for using the full potential of ICT in government operations. Bringing ICT on board makes it obvious that there should be a better way to build the public administration systems and institutions. C-government for "coordinated government" looks like the first indispensable step. Building knowledge platforms in public administration and using ICT to promote non-linear relationships, networking within public administration and between public administration, business firms and citizens looks like the direction to follow in future.
- 6. **Governments should learn.** The emerging new technological opportunities have to be internalized at all levels of government in order to open doors for their creative application. Also, the body of knowledge about things to avoid in e-government development is growing. It includes *inter alia* clear warnings against ignoring the demand side of e-government development; choosing too vast and complex applications; overestimating the value of on-line presence as a channel for delivery of public services; underestimating the need for technology-neutral, enforceable legal framework.

This Report brings therefore above the overall context and rationale for choosing its theme as well as some of its major findings. It brings also the papers and presentations of the experts.

It should be best read in conjunction with the above-mentioned World Public Sector Report 2003 (also available on the UNPAN site), as it complements and verifies additionally main analytical findings of that Report.

Guido Bertucci Director Division for Public Administration and Development Management UNDESA

New York, 15 December 2003

### **CHALLENGES FOR E-GOVERNMENT DEVELOPMENT**

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#### INTRODUCTION

The emergence of the Internet and developments in processing capacity and data storage over the 1990s have significantly altered the environment for ICT use across society and in government. While the longer-term effects of this digital revolution are likely to be profound, these developments have already increased pressure on governments to improve performance and provided them the tools to do so.

This does not mean, however, that e-government challenges are primarily technical. E-government services continue to be embedded in the environment of today's public administrations and therefore remain limited by what these administrations are capable, and willing, to do. The term "e-government", as used by the OECD E-Government Project, applies to the use of ICT as a tool *to achieve better government*. Thus, e-government is not about business as usual, but should instead focus on using ICT to transform the structures, operations and, most importantly, the culture of government.

The following presentation focuses on the external and internal challenges to e-government implementation, drawing on the recent OECD publication, *The e-Government Imperative* (OECD: 2003):

- The e-government context
- External barriers to e-government implementation
- Internal challenges to e-government implementation

It will then touch on the extent to which the OECD experience is applicable to non-OECD countries before offering some elements of conclusion.

#### The e-government context

E-government does not operate alone. The *context* in which e-government is taking place and the ability of governments to respond to these external pressures are determinant for the ultimate success of e-government. In particular, the broader information society of which e-government is but one component, plays a role in 1) the technological tools available, 2) the level of access that citizens and business will have, 3) their overall trust in electronic channels and 4) their expectations of the types of services that should be delivered and how they should be delivered. All of these factors affect the willingness of businesses and citizens to use, or takeup, electronic services. The failure to respond to an ever-changing environment and expectations can result in barriers to e-government implementation.

#### Rapid technological change

Technological advancements and the search by suppliers for new markets have resulted in a bewildering array of technical solutions in search of problems to fix. Governments face the challenge of fostering the development of e-government while there is still great uncertainty regarding fast moving technological change, and it is difficult to anticipate future policy impacts in detail. New technologies are tempting because

they often promise better solutions and enticing possibilities for business change. More often, however, they promise solutions that purport to enable an organisation to implement IT without changing its business processes. It is therefore not surprising that public sector organisations keep trying to develop systems based on new technologies. Experience shows, however, that systems built on emerging and unknown technologies are very susceptible to failure. In some instances the potential benefits might warrant taking such huge risks; most often this is not the case.

Technical problems also arise from trying to choose a standard before the market has settled on a solution. In 1999, Finland was one of the earliest countries to launch a national electronic identity card that provided digital signatures for secure electronic transactions. Takeup of the card has been much lower than expected mainly due to the lack of public services that currently require public authentication. Another reason for the low takeup, however, is that in trying to develop the most secure standard possible at the time, the government did not take into consideration either the development of private market technologies or the desired and actual needs of the potential users who are often satisfied with the use, for example, of a simple PIN code. Eventually a stronger market will probably develop for secure transactions, but by then the technological solutions will have likely evolved as well.

Risk of failure can be reduced by using well-proven approaches or even better, standard software, although this will often imply that business processes have to be adapted to the possibilities offered by the IT system. The application of common commercial practice, rather than custom software, has proven time and again to be the most successful solution. Where the use of unproven technologies is unavoidable, a testing programme for the new technology in question carried out prior to the contract with the supplier could help identify, assess and manage the risks. Broad approaches to dealing with emerging technologies include:

- Technology neutrality in legislation and regulation to avoid closing off promising options, and flexibility within broad regulatory frameworks and adaptation of current laws to a digital world.
- Performance requirements rather than technical specifications when procuring new technologies.
- Involvement of all stakeholders in regulatory processes.
- Increasingly looking to international co-operation to harmonise approaches to transborder issues.

#### The digital divide

The digital divide is an important barrier to e-government in that people who do not have access to the Internet will be unable to benefit from online services. In OECD countries, a growing number of people have access to the Internet, but there are still large numbers of people who do not. While e-government can also improve services to citizens through other channels, the inability to provide online services to all citizens can hold back e-government projects.

Additionally, the groups in society with lower levels of access tend to be those that are already disadvantaged. For example, lower income groups have less access to the Internet than higher income groups. Such disadvantaged groups are often the targets of government interventions and have a higher level of ongoing interaction with government. Many of their interactions with government are complex – establishing identity, entitlement for assistance, complex medical or social intervention – and they are not all well suited to online provision. While access to government information and services would be important for such groups, they may not benefit from enhancements to service quality and greater choice through online services.

The digital divide is a particular challenge in some OECD countries because some studies seem to indicate that Internet and pc penetration may be reaching a limit that is defined by the perceived value for citizens to be online. As a report by Statistics Finland states, "What is crucial is whether there is something rewarding related to the use of the Internet and e-mail...this would, therefore, encourage those, who are unfamiliar with information networks at work or school to use information networks. Changes in the communication capabilities [in Finland] between 1996 and 1999 show that the motivation to use Internet connections has not increased at all in three years despite the increase in the opportunity to use, or become competent, in the Internet and e-mail."

E-government services may, by their very existence, provide an additional incentive for individuals to access the Internet. Given that transactions with government are relatively rare for most citizens, however, public electronic services are unlikely to, in and of themselves, be an incentive to purchase a PC and Internet connection. On the other hand, government information and opportunities for consultation and participation, particularly at the local level, may be important in conjunction with other factors such as educational uses, access to e-mail and messaging and home PC use. It is thus important, on e-government grounds alone, for governments to continue policies and specific interventions to reduce the digital divide. A specific focus on frequently used government services with value to groups with low access, along with overall marketing of online government services, are all important elements of digital divide policies.

#### **Privacy and security concerns**

Citizens are unlikely to use e-government services without a guarantee of privacy and security. Governments also have a strong interest in maintaining citizens' trust (e.g. that information provided will not be misused). Ensuring that e-government initiatives are in step with society's expectations in this area is a crucial means of building trust. The challenge facing e-government coordinators and implementers is to respect accepted privacy principles while allowing the benefits of the Internet and other technologies to flow to citizens. This balance is of particular importance when considering seamless government services involving data sharing among agencies.

Government has a responsibility to provide leadership in developing a culture of privacy protection and security. It should provide this leadership through its roles in the development of public policy, as owner and operator of systems and networks, and as a user of such systems and networks. As a user of information systems and networks, government shares a role with businesses, other organisations and individuals for ensuring secure use of the system and network.

The OECD was the first intergovernmental organisation to issue guidelines on international policy for the protection of privacy in computerised data processing. In 1980, the Guidelines on the Protection of Privacy and Transborder Flows of Personal Data (Privacy Guidelines) were adopted as a Recommendation of the OECD Council. They were followed by the 1985 Declaration on Transborder Data Flows, and more recently by the Ministerial Declaration on the Protection of Privacy on Global Networks, adopted by OECD Ministers at the 1998 Ottawa conference, "A Borderless World: Realising the Potential of Global Electronic Commerce". At that conference, OECD Ministers reaffirmed "their commitment to the protection of privacy on global networks in order to ensure the respect of important rights, build confidence in global networks, and to prevent unnecessary restrictions on transborder flows of personal data".

The revised OECD Guidelines for the Security of Information Systems and Networks: Towards a Culture of Security that were adopted by the OECD Council in July 2002, respond to the ever-changing nature of the security environment by promoting the development of a culture of security – that is, a focus on security in the development of information systems and networks and the adoption of new ways of thinking and behaving by all participants when using information systems and communicating or transacting across networks.

#### Citizen expectations and seamless services

Another constraint on e-government is the difficulty with which governments are developing services that are customer-focused. As governments are developing more and more electronic services, they are also coming to the realisation that they often do not know what kind of e-government citizens want. ICT tools have provided governments with new ways to provide information and to consult with citizens, but determining the preferences of citizens and businesses with regard to the structure and content of electronic services rests a true challenge for OECD countries, in part because many people would hard-pressed to be able to articulate their expectations of government, even with a full understanding of the technological possibilities.

Countries are developing a common understanding, however, that services should be organised and provided according to customer needs and preferences and not according to the internal logic (or illogic) of government administrations. The Internet has brought a quantum leap in efforts to provide a customer focus, and OECD countries are actively developing initiatives to draw together information and services for specific customer groups. These seamless online services aim to transcend the agency-based structure of the supply of information and services and present users with a coherent, integrated package of government information and services. Such services can provide higher levels of value to customers than separate services.

One-stop shops, advice bureaux, whole-of-government telephone call centres and services such as information kiosks have attempted to bring together information and services from different government agencies. The capacity to offer integrated, seamless government services so that users can interact with government as a single organisation, however, relies not only on ICT tools, but also on deeper organisational and cultural changes within public administrations.

The development of a customer focus requires collaboration. As services become more complex, efficiency considerations require greater co-operation between agencies, in areas such as authentication, shared processing and the exchange of data. The need for collaboration between agencies thus has both "front-office" (service to the customer) and "back-office" (efficiency in government) dimensions. From the customer's point of view, government should appear as one organisation; from government agencies' point of view, the customer should appear as a single customer.

#### External barriers to e-government implementation

The e-government context affects e-government initiatives across government, and yet the dominant structural forms in all OECD governments are, to varying degrees, "stovepipe" or "silo" organisational units that have relatively clear, mutually exclusive areas of responsibility and control and political accountability. External e-government barriers often concern breakdowns, missing components or lack of flexibility in the government-wide frameworks that enable e-government. The result can be an inability to achieve a whole-of-government perspective in e-government implementation. This is particularly true when e-government is treated as a merely technical issue rather than one that concerns the basic service delivery mandate of government, or when agencies ignore how additional value can be created by better collaborating with other agencies providing related services. In this sense, the barriers are not external to government itself, but rather concern responsibilities that are broader than the sphere of activity of any individual agency.

Barriers can also arise for agencies that only focus on putting their own services online, without an eye on the broader government context that governs what they can and cannot do (e.g. procurement, human resource and budgetary rules). In particular, if they are not well understood, regulatory and financial rules can seem to pose insurmountable barriers to e-government implementation.

#### Legislative and regulatory barriers

The success of e-government initiatives and processes are highly dependent on government's role in ensuring a proper legal framework for their operation. The introduction and uptake of e-government services and processes will remain minimal without a legal equivalence between digital and paper processes. OECD governments are aware of the need for a framework to provide for enforceable electronic transactions, both in the e-government sphere and for electronic commerce, and have taken action.

For example, the legal recognition of digital signatures is necessary if they are to be used in e-government for the submission of electronic forms containing sensitive personal or financial information. As of 2002, 26 of the 30 OECD countries have passed legislation recognising digital signatures, though a much smaller number have actually introduced applications beyond a pilot phase. Many are waiting for the private sector to fill the void.

Additionally, current public governance frameworks based on the assumption that agencies work alone (for example, in terms of performance management, accountability frameworks, data sharing) can act to inhibit collaboration and information sharing between organisations. Complexity of regulations and requirements on agencies can be another barrier; if agencies are unable to determine what is required of them, they may be unwilling to invest in a project that may not conform with requirements. In addition, privacy and security concerns need to be addressed through appropriate legislation and regulations (as well as in practice) before e-government initiatives can advance.

The web of government requirements around ICT procurement, industry support, contract requirements, compliance with security requirements and other standards can increase costs and drag out implementation timetables. Seamless government services involving a number of agencies unavoidably add to the complexity of implementation.

The rules and regulations around ICT use can build up, and impose resource obligations on agencies. Given the pervasive nature of ICT use in government, these requirements can cover acquisition and financing, network operations and security, staffing and skills issues, service design, monitoring and reporting. They are likely to have been issued by a number of agencies, rather than a single agency or the central egovernment co-ordinating unit. It would be of value to regularly undertake a review of the overall regulations and requirements that govern ICT acquisition and use. As a first step, identifying these areas would help indicate areas where redundant or overlapping regulations were in place: an agreed process of regular examination would provide an opportunity to get rid of requirements that have outlived their usefulness.

Confusion about what exactly are the requirements on agencies implementing e-government is a related problem. Agencies may need clarification on what they should and should not do, particularly in the areas of data security and technical standards. Especially in the case of small agencies with few resources, the cost of re-developing an e-government project which has adopted the wrong standards is potentially prohibitive. A vicious circle may occur when ignorance of current regulations leads to incorrect development of e-government projects and to the waste of resources, and in turn, result in more regulation.

Combining existing requirements with clear informal/regulatory guidance is a primary challenge to egovernment co-ordinators. Government should address how existing regulations should be clarified and explained to e-governments implementers' and in turn impact the implementation of services.

E-government has the potential to improve collaboration across agencies and organisations, but there are a number of regulatory barriers to collaboration. For example accountability rules, designed to ensure responsible use of public resources by clearly identifying who does what, can impede collaboration as it may

be unclear who is accountable for shared projects. Similarly, performance management follows clear distinctions of who did what, and there is little flexibility for evaluating shared projects. Finally, legislation enacted in order to protect the privacy and security of citizens' data can impede data sharing across government.

#### **Budgetary barriers**

OECD governments operate within vertical funding structures, in accordance with the core public management principle of holding an agency accountable for achieving organisational objectives and giving it the resources to accomplish those objectives. However, such budgetary frameworks may not take into account the specific needs of certain e-government projects, particularly those involving long-term funding requirements and collaboration across agencies. In order to maximise the benefits of e-government financing issues must be addressed.

One commentator (Harvard Policy Group) considers there is a virtually inverse relationship between traditional government budgeting and ICT investments.

Focus of traditional government budgeting	Characteristics of high-value ICT
	investments
Single-year (or biennial) expenditures	Multi-year investments
Programme-by-programme performance	Enterprise or cross-boundary performance
Financial cost/benefits	Financial and non-financial costs/benefits
Level of effort within existing work flows	Changes in the flow of work
Ongoing operations	"Start-up" operations
Control	Innovation

#### Table 1. Traditional budgeting and budgeting for ICT investments

*Source*: Harvard Policy Group (2001)

A number of features of current budgetary arrangements in OECD countries work against efficient implementation of e-government. Current budgetary frameworks provide financing for individual projects, but do little to account for the shared responsibility inherent in many e-government projects.

In terms of funding, the treatment of certain ICT spending as capital rather than recurrent expenditure can be a challenge. Not all ICT expenditure is of a capital or investment nature, but involves maintenance, associated recurrent staffing costs, or small-scale projects. However, if major projects are not considered as investment, they will need to compete with other more pressing recurrent funding proposals, and in this context will seem to involve large levels of expenditure.

In related terms, to the extent that an explicit choice is made, the implementation of e-government is often unlikely to win out in competition with other compelling public policy objectives such as education, security and health. While most e-government proposals will be argued for in terms of programme outcomes rather than in terms of advancing e-government per se, the *level of resources* devoted to e-government is ultimately a matter for governments to determine in the light of their overall priorities.

Budget time horizons can also pose problems for e-government. Many e-government projects will be multiyear in nature, and thus require commitments to spend resources over a long period, sometimes well beyond the annual or multi-year budgeting horizon. Such projects represent a commitment to spend future revenues, and governments are understandably reluctant to tie up future spending. Projects that do not require such a commitment may be favoured. Finally, the difficulty of measuring costs and potential benefits for e-government projects makes it hard to develop funding cases for projects and compare alternatives in a budget-setting context.

Budgeting rules can also contain a number of rigidities that hold back e-government collaboration by preventing shared funding arrangements. The vertical nature of current arrangements means that it can be difficult to request joint funding, to pay into a project being done by another agency, or to pool funds. There are few mechanisms for shared funding, and it can be difficult to assess the extent to which agencies are benefiting from (and hence should contribute to) a shared project.

As long as there is no framework *for profit sharing*, agencies have no incentives to eliminate redundant systems by sharing systems with other agencies unless they can share in some of the savings generated. The use of *performance-based budgeting* can also create disincentives for collaboration, by rewarding independent behaviour at the expense of shared projects.

The linked nature of many e-government projects across traditional programme and organisational lines means that shared budgetary arrangements are essential. On the basis that the bulk of funds for e-government will (and should) be provided through agency budgets, the budget process can be used to promote collaboration of e-government initiatives.

#### Common technical frameworks and infrastructure

Finally, barriers to seamless service delivery may arise from the inability of agencies to communicate with each other. Government can help by providing a technological framework for delivering electronic services. A national approach may range from shared systems to common rules and/or standards governing separate, but connected systems.

Harmonisation is a particular important element as the current e-government context is in part due to past failures to harmonise systems and standards. Governments continue to make considerable ICT investments and at any point in time will have a wide range of ICT systems in place. However, legacy systems (systems that were designed for specific purposes) can be inflexible, and incompatible systems make it hard to deploy new applications that involve the need for data sharing or other interaction between disparate systems. Legacy systems can also lead to increased costs, for example related to data transfer. In fact, the difficulty of integrating legacy systems with new initiatives can be a major barrier to e-government. Integrating back office information management and information processing systems with the Internet to provide an online interface to clients has been a major preoccupation of e-government efforts.

Establishing common technical standards and infrastructure can pave the way for greater efficiency within government. Important economies can be gained through a whole-of-government approach, both in terms of reducing redundant systems and by lowering the legal and technological barriers for collaboration across organisations. For example, governments can benefit from scale economies for some common back-office processes, such as human resources management and payroll.

The German government has begun to consolidate government wide standards and guidance into one document, SAGA which has helped guide the implementation of e-government in Germany. The aim of SAGA is to develop standards for the smooth flow of digital information between citizens, business and the federal administration and to make as many electronic services as possible available using uniform procedures. SAGA is not a final document. It is constantly revised to include the latest developments and amendments. To develop the SAGA document in a targeted way, the federal government's service portal now includes a technology forum at http://foren.kbst.bund.de. It offers German-speaking experts and anyone

interested a discussion area covering the various topics of SAGA, such as appropriate interface connections or interdisciplinary data models.

In addition, shared infrastructure, for example for authentication of key customer groups, can facilitate individual agency initiatives that would otherwise lack a business case. It can also free agencies to focus on their specific content issues. Shared infrastructure, developed centrally or by a lead agency, can facilitate seamless online services and improve the business case for specific agency initiatives. The use of such infrastructure by agencies can be mandatory or available to be adopted if the infrastructure meets agency needs. For some initiatives, such as whole-of-government portals or secure networks, their value lies in their inclusive nature.

The issue of harmonisation and standards is a complex one, and solutions advanced will develop and change over time. Currently, the need for integrated transactional seamless government services has helped promote the development of middleware solutions and web services a software integrating technology incorporating standards such as Extensible Markup Language (XML) which facilitate the exchange of data between different systems. The promotion of whole of government frameworks, standards and data definitions by e-government co-ordinators will further facilitate specific proposals to develop cross agency integrated services.

#### Internal challenges to e-government implementation

The establishment of overall frameworks is an important step in meeting common e-government challenges. While taking a common or shared approach promotes the consistency and interoperability of IT systems, it should not, however, be construed as shifting the responsibility away from the agencies that are responsible for everyday implementation of electronic services. Indeed, a number of serious challenges to e-government implementation remain even once all of the appropriate frameworks are put in place. These challenges involve ensuring that a common understanding and sense of mission is shared across all levels of government and ensuring the necessary leadership to accomplish this. It also requires improving co-ordination and collaboration, clarifying public private partnerships, ensuring that government officials have the necessary skills and tools to carry-out their mission and to monitor and evaluate success.

#### Ensuring a common vision

A common vision is essential to e-government as a means to engage and co-ordinate agencies. It also serves to engage political leaders and to impress upon them the importance of e-government. A common vision is not a goal in itself, but a means to achieve policy priorities.

In OECD countries, most advanced e-government organisations have a vision statement. Such a statement may be linked to political commitment at a higher level, or it may be dependent on a general manager or the head of an IT unit with sufficient determination and resources.

Whether the vision is shared across the government or is limited to an individual organisation, however, makes a significant difference. No matter how advanced they are in terms of the services that they provide, organisations dependent on their own vision may not be aware of co-ordination problems that extend beyond their own services.

A government-wide vision helps to tie e-government initiatives with broader strategic and reform objectives. It can help promote inter-ministerial co-ordination, ensure balance and fairness and help to stay the course over a number of years. Having a clear vision of reform helps to maintain consistency and a sense of purpose. Towards this end, political leaders are key supporters of an e-government vision. Political leadership serves to diffuse the vision and to give it added weight. While a vision statement is needed, however, it is not enough.

The vision, the rationale and the validation for reform also need to be communicated throughout the administration.

For example, President Vicente Fox of Mexico has established a good government agenda with six major lines of action, one of them being e-government and all of them related to each other. Each year, the president negotiates with the head of every agency the performance targets for the agenda, which includes e-government objectives and targets, as well as the effect of the latter on savings, quality, innovation and transparency. After several decades of mistrust by the public and general corruption, the government of Mexico faces the big challenge of changing its culture rapidly and effectively. In 2001 it produced its code of ethics that has been taught online to practically all federal government middle and senior level managers.

The most effective e-government visions depend on input from a variety of stakeholders. Increasingly, users (both citizens and business), non-governmental organisations, and government employees are being brought into the process of defining an e-government vision. This serves to ensure ownership of an e-government vision and to make sure that it can be translated into realistic action plans.

#### Providing leadership at many levels

Governments are increasingly asked to translate a general vision into effective public services while facing time constraints, lack of resources and political pressures. The cost of losing the reform momentum can be high. The role of communicating the need for reform therefore depends on e-government advocates and leaders throughout government.

Leadership is not just about motivating people and creating incentives and opportunities for actions. Egovernment is also about change, and many e-government advances to date have been driven by the enthusiasm of individuals and individual agencies. But there can be considerable resistance to change particularly to the level of change required if some of the more significant efficiencies and service enhancements through seamless online services are to be realised. While the form and arrangements adopted are determined in the context of each country's political and administrative environment and will continue to evolve as lessons are learnt, leadership is an essential ingredient of e-government in order to motivate and break down barriers to change.

Sustained leadership is important at all levels of the e-government cycle. At the early stages, there is a need to gain acceptance of concepts and benefits, and to put in place frameworks to sustain momentum and structure implementation in an efficient manner. As more complex transactional services are implemented, the need for leadership and support will continue, particularly as benefits may take time to emerge.

Leadership is a catalyst for innovation. Broad reforms require perspectives and pioneers able to translate the vision into action. E-government leaders should learn how to put in place the right administrative mechanism to support agencies in the e-government implementation.

There are many styles of leadership. Different kinds of leadership may co-exist and be a key to success, depending on the stage of the e-government process. In a very early stage of e-government development the leader may obtain views on what needs to change, share a common vision with the personnel and evaluate new ideas. In a more mature stage, selling the benefits of a vision and creating personnel commitment to it are also required.

Leadership can be exercised at *all levels of the organisation*. Political leadership has an important role in shaping and backing e-government initiatives. Political leaders contribute to the establishment of the e-government vision, define priorities, filter citizens' needs, make the decisions and provide the will to carry them out. Strong political leadership can make a difference in forcing the momentum for change and easing the reform process. It can also increase management motivation and sense of responsibility.

Leadership can also articulate a unifying theme that can propel the e-government initiative through all the necessary steps. It is important to understand that results are most likely when leaders elevate the public profile of their vision and press for its successful implementation by tying it to broader government policy agendas.

#### Strengthening co-ordination

Decentralisation has been a key component of public management reforms in most OECD countries over the past 20 years. Business unit managers need to manage ICT as they do other resources and are generally the best placed to be aware of business needs that can be efficiently addressed by ICT applications. However, agencies cannot operate in isolation, especially with regard to ICT. The nature of e-government requires a level of co-operative action to ensure interoperability, avoid duplication, ensure coherent action in a range of crucial areas such as security and privacy protection, and to provide the framework and capacity for seamless services. The need for co-ordination becomes more pressing as OECD countries increasingly move to implement more complex, transactional services. The cost of introducing such services, and the cost of making them interoperable after they have been introduced, makes avoiding duplication and implementing projects in a structured environment all the more pressing.

There is, as a result, a *central dilemma* for e-government implementation. In the terms of the Finnish Council of Ministers: "a basic problem is how agencies' responsibility for results and autonomous operation can be retained while at the same time ensuring the interests of the government administration at large in questions pertaining to interoperable systems and shared use of information resources". While this reflects the broader issue for government of co-ordination versus devolved management responsibility, if e-government is to succeed it is crucial to get the balance right. The stronger the control exercised over co-ordination, the higher the costs due to the web of regulations and requirements to which new, creative initiatives must adhere. Co-ordination may stifle innovation and initiative, leading to foregone opportunities. However a co-ordinated approach may generate efficiencies, reduce risk and facilitate a faster and broader rollout of e-government initiatives.

Whole-of-government structures can play an important role in steering e-government implementation across government, in providing a framework for collaboration across agencies and in keeping e-government activity aligned on broader public administration agendas. Approaches that have been adopted include committees of agency heads and chief information officers. The roles of such bodies vary, from purely advisory and information sharing, through to policy development and implementation oversight. The involvement of non-government representatives from industry bodies, academia and civil society organisations has been effective.

An important role of such central co-ordinating units is to act as a *focal point* for promoting government-wide e-government development. This may involve being responsible for developing the e-government strategy, monitoring progress towards goals, promoting benefits to the public, linking e-government activity to broader reform and information society goals and generally acting to generate and sustain momentum. This may also involve reporting on progress and reassessing strategies in the light of experience and as progress is made.

#### Improving collaboration

As noted earlier, providing seamless services is fast becoming a major challenge in order to provide usercentric e-government. Doing so, however, requires moving beyond co-ordination to integrating certain structures and processes related to service delivery. Experience with implementing electronic seamless services has highlighted the impact they can have on agencies' ways of working, structures and culture. The challenge of implementing and operating seamless services has also highlighted the need for change in the internal governance frameworks of public administrations. OECD countries have taken a number of steps to improve the seamless delivery of information and services. At the level of information provision, for example, online government portals are well established as a means of gathering together material from different parts of government. But the development of portals to provide customer-focused information, while challenging, has generally not required addressing differences in agencies' ways of working or technical interoperability issues beyond a certain level. In practice, portals have also been established in some isolation from other service delivery channels (although in a number of countries call-centre and front-counter staff use the co-ordinated online information as a core resource).

Arrangements for reconciling back-office systems with an integrated customer interface may give the impression that collaboration can be achieved primarily at the technical level, and that other operations can be left undisturbed. In practice this is unlikely to be the case. In effect, collaborating for seamless e-government services will lead to a deeper engagement between the agencies involved:

- Implementation of *integration models* for online services will require a high level of cooperation for architectures, service delivery policies and standards, implementation methods and schedules, and the co-ordinated acquisition of ICT services and equipment by individual agencies. This will have implications for budgets, business plans, skills and resource management generally. Joint teams may be established to implement new arrangements and may be retained to carry out or co-ordinate maintenance and upgrading.
- Seamless online service *content* will require deeper collaboration on issues such as service quality, presentation of material, decision making on individual cases, dealing with problems, complaints and appeals. This will have an impact on ways of working, decentralised authority and other dimensions of organisational change. Overall *service delivery policies* involving all delivery channels will need to be agreed and co-ordinated by agencies dealing with the specific customer group. There is little point or value in providing a seamless government online service while leaving other channels uncoordinated. In practice, such an approach would be difficult to sustain.
- Seamless service delivery will reinforce pressures for *co-ordinated policies* covering the particular customer group. This implies a further layer of collaboration between agencies, building on what may already exist.

In Sweden, Wilma, the Web-based Information System Linking Migration Authorities, is a new IT support tool shared by Swedish authorities involved in processing migration cases. The purpose of Wilma is to process information concerning individuals, cases, documents and decisions. IT support allows it to embrace the entire chain, from application for a visa or residence permit at the diplomatic mission to a decision in the case and any appeal. IT support will also promote more efficient monitoring of entries and exits.

The development of Wilma is part of the broad changes aimed at rationalising the multi-authority process affecting the work of diplomatic missions. The improvement involves a basic strategy for applying a holistic approach to developing process-oriented methods. In addition to IT support, the new measures include the development of various forms of collaboration, skills development, strengthening of resources in the form of migration officers posted overseas, a central help desk, improved information, improved follow-up, etc.

Seamless online government service initiatives challenge traditional *accountability* arrangements. Ministers and senior executives are generally responsible for administration of specific legislative or executive instruments. Accountability rules and practices have been developed to clarify responsibility in situations where the service is outsourced, with public administrations and ministers accepting responsibility for the action of non-government providers. The situation may be more complex when the situation involves an agency outside a minister's area of responsibility that provides a service for which the minister is responsible

or where cross-agency teams operate. Arrangements need to be made to assign responsibility in these cases. As already occurs in a range of policy areas, responsibilities will invariably be shared. This is not necessarily a problem, so long as there is clarity about the sharing.

The *management* of seamless online service initiatives also raises its own challenges for agency managers, who are faced with issues of managerial autonomy and collaboration in the context of practical implementation. OECD countries' experience suggests that managers and central e-government co-ordinators can facilitate the development of seamless online services with common customers by:

- Developing a *shared vision* for services for the customer group. Political leaders, staff, unions and agency management should endorse the need to collaborate and accept the value of a customer rather than an agency outlook must occur. This includes the development of plans that could usefully cover projected services, implementation paths, agreed standards and procedures and co-ordinated change management strategies
- Increasing use of *formal co-operative mechanisms* such as quasi-contracts or other statements of co-operation spelling out joint responsibilities, objectives, agreed contribution of resources and other aspects of the linked but separate roles of each agency involved. This could involve the adoption of a shared responsibility approach, with a formal agreement covering resource issues and performance of the system. It could also be helpful to create other *incentives for collaboration*, such as a central facilitation fund to focus on design, innovation and incentive structures to facilitate progress.
- Facilitating the development of *customer-focused clusters* to help identify opportunities for closer technical, service delivery and policy integration. Sharing of infrastructure and development or use of a lead agency model will be important for collaboration and would be facilitated by co-ordinated acquisition of ICT within each cluster. Cross-agency teams can help implement and manage specific projects or act as a within-government application service provider to the relevant agencies.
- Taking action to address constraints arising from *internal governance frameworks* in the public administration and adopting team-based approaches involving staff from more than one agency. This will require human resource management frameworks, legal frameworks and privacy and data protection.

In practice, collaborative models will involve elements of all of the above approaches, and the approaches will change as co-operation becomes more ingrained.

#### Clarifying public-private partnerships

Engagement with private-sector suppliers has been an integral feature of government use of ICT. Publicprivate relationships have broadened from the acquisition of products and services such as mainframe computers which governments themselves could not provide, to services such as the operation of computing facilities and direct provision to end users of government services. In the broadest sense, the term "publicprivate partnership" could be used to cover all arrangements where governments contractually engage with a non-government entity to provide goods or services. More narrowly, partnerships involve arrangements whereby work, risk and rewards are shared. In practice, all private supplier relationships are likely to involve elements of partnership, and it is therefore useful to see partnerships as part of a continuum. The partnership management issues they raise need to be addressed as part of the implementation of any e-government project or strategy. The more comprehensive and innovative the partnership arrangements, the greater the likely challenge to existing frameworks. The challenges for developing sound partnerships include as follows:

- Accountability, scrutiny and audit requirements need to balance providing enough flexibility for innovative arrangements and preserving required levels of oversight of public expenditure. This is a difficult area, although arrangements to achieve this balance are evolving in countries with experience in partnerships both within and outside the ICT area. The use of public-private partnerships should not be at the expense of public scrutiny or compromise accepted privacy or service quality standards. The business case for partnerships should not depend on a lowering of standards.
- The *specification of outputs*, including value for money, can be difficult in arrangements designed to operate over a long period and which allow for future resetting of priorities. If specifications are too tight, it may be necessary to renegotiate if they are too broad, requirements may be unclear. Arrangements to deal with failure also need to be clear.
- Traditional procurement arrangements aim to transfer risk while retaining control. It needs to be accepted that, in a partnership, both parties should *share the risks* and the benefits. The issue here is management of risk, with the respective risks assigned to the parties best placed to manage them.
- Retaining the public administration's *capacity to manage the relationship* with the private partner is of crucial concern. Managerial awareness and commitment is essential to ensure that the required skills are developed and maintained (see section on skills).
- While structured review and clauses can facilitate review and formal approaches to the market, there is a danger that an existing partnership may be seen as the only approach, thereby effectively *excluding other service providers*.

Ultimately, the overall relationship between the partners is important. The two sides must accept the sharing of risk and rewards, and specify outputs in a way that allows for flexibility. They must also accept joint responsibility for project outputs, while acknowledging the differences in accountability and responsibility between government and outside partners. Agencies must balance the need for stability and stable relationships with the need to reassess the value of current partnerships.

In Denmark, there is limited experience with digital projects in public-private partnerships. Therefore, both the public and private sectors have been interested in discussing together what is important for forming a successful partnership. Public-private partnerships are often used for complex projects in which knowledge from both the public and private sectors needs to be combined. While the goal must be clear from the start, the solution is most likely to be developed in partnership. This is a challenge and requires both the private and the public organisation to be ready to engage in a close partnership.

The dialogue has led to a joint document, which emphasises three themes:

1. The importance of managerial involvement in setting the project goal, clarifying existing work processes, deciding the space for restructuring and ensuring an overall efficient set-up.

2. The need to improve the efficiency of the public sector. It is important to establish a business case in order to get return on the investment. Furthermore, it is essential to agree on common goals and get the incentives right to achieve them, internally as well as for the partner.

3. To have the necessary flexibility to develop the solution, it is important when calling for tender and writing the contract not always to indicate a specific solution for the project but to concentrate on essential goals and requirements. The use of options can give the flexibility necessary to change that results from an ongoing dialogue.

#### Meeting rapidly changing skill needs

ICT-related skills are important not just for ICT production and service industries, but for the economy as a whole. ICT skills have become a new general skill, like literacy or numeracy, and governments have implemented a range of policies to promote the acquisition of basic and advanced ICT skills across the economy. E-government initiatives *increase the importance of the ICT-related skills* required by public administration work forces.

The skills required for e-government are *not simply technical*, as general managers need broad skills to engage in e-government decision making. Necessary skills include basic technical understanding (IT literacy) but also an understanding of information management and the information society. Managers must be able to lead (and not be led by) the organisation's IT department and outside partners, and they must be able to integrate the organisation's ICT strategy with the broader goals of the organisation.

Furthermore, traditional management skills need to be updated and strengthened to deal with the impacts of e-government. Additional competencies are needed in areas such as organisational change, co-operation and collaboration across departments, public-private partnerships, accountability frameworks and performance management.

Four specific *sets of skills* can be identified as essential to successful e-government strategies: information technology (IT) skills, information management (IM) skills, information society (IS) skills, and updated management skills. While the borders of these skill sets are blurred, they provide a useful framework for analysis.

In the early phases of online services, when the Internet was relatively unfamiliar, many projects were driven by IT specialists. General managers lacked interest and/or the required skills. A major challenge is to overcome the view, still held by many employees and managers, that e-government skills are technical matters best left to specialists. As ICT is increasingly integrated into public administrations, a basic knowledge of technology and the Internet is becoming essential for all employees. Basic IT skills include a working knowledge of applications and how they can improve work quality and efficiency.

At the manager level, the adoption of e-government solutions has been hampered by business unit managers' lack of knowledge about how technology can be used as a tool to accomplish or improve government processes. Managers need to be able to work with their organisation's information technology and information management experts to *match government processes with appropriate technical solutions*.

Like all employees, managers need basic IT skills to use ICT effectively. But managers also need to be able to understand the possibilities of ICT, to set or manage the information strategy for the organisation and to deal with the impact of e-government on the organisation. They need to understand how new technology works, how it can be incorporated into existing government functions, and how e-government applications can build new government services and products or open new channels of communication. A solid understanding of the options and their strengths and weaknesses will give managers confidence to negotiate and to specify characteristics for *developing projects that will work*.

After having provided training schemes and resources for e-literacy training for employees, the Italian Department of Public Administration in co-operation with the Department for Innovation Technologies, has recently promoted two new training programmes for managers. The first one aims at providing top managers (state government) with training to develop information management and information society skills. The programme is run by the Italian National School for Public Administration.

The second one aims at providing top and middle managers of regional and local administrations with training to develop management skills, necessary to meet new organisational needs relating to e-government in the wider context of modernisation plans. This training scheme is part of a broader programme to foster innovation and modernisation in public administrations.

#### Monitoring and evaluation

Finally, it is necessary to monitor and evaluate e-government to understand demand, assess the benefits to users of alternative proposals and evaluate the effectiveness of proposals in meeting their objectives. Evaluation is needed to argue the case for new projects and expenditure, to justify continuing with initiatives, to allocate additional IT funds, to assess progress towards programme goals and to understand impacts. In an era of increasingly tight public spending, governments need to show concrete benefits of ICT investments in order to gain and maintain political support. Additionally, monitoring and evaluation can assist with programme consolidation and selection of standards. OECD countries recognise the importance of this issue, and e-government policies and strategies reflect this recognition.

Monitoring and evaluation of government programmes is generally difficult, given the frequent lack of clarity of objectives owing to the different and often competing views held by different stakeholders. In addition, overlapping initiatives and policies and continuous fine-tuning of initiatives complicate monitoring and evaluation efforts. The fact that e-government is relatively new and that there are few advanced services means fewer models and actual outcome experiences that can be used for benchmarking.

These problems are magnified when attempting to monitor and evaluate e-government programmes. ICT projects are hard to evaluate because of the pervasive nature of ICTs, the integration of ICT goals with policy goals and the organisational changes that necessarily accompany e-government initiatives. Effective evaluation requires good metrics, regular monitoring and reporting, disciplined and professional use of robust evaluation frameworks and the use of long-term evaluation practices. These qualities depend on a government's overall evaluation culture. The following table summarises some of the barriers to e-government evaluation and gives various examples.

#### **Obstacles to evaluating e-government**

Obstacle	Example
Lack of clarity of objectives stated goals may not have associated measures of progress; there may be multiple objectives	Hard to measure "quality of life"
Hard to define success	If people are spending more time online, is that good or bad?
Easy to be too ambitious	Several countries have set targets of "all services online" by specific dates. But not all services are appropriate to put online.
Information paradox	The benefits of ICT investment may not be visible for some time (see OECD Growth Study)
Question of who are the clients; multiple clients	Should one evaluate benefits for the users, the employees, the government at large, partners, etc.?
Hard to measure shared benefits	Shared infrastructure, multiple projects benefiting from shared portal, etc.
Private sector tools may not work for governments	Governments place importance on social values that are not incorporated into private sector tools and objectives
Available indicators may not be the good ones	Current indicators (such as number of employees with Internet connections) are helpful, but have limits
Government definitions and methodologies vary from one country to the next	Collecting data is easier at the local level, but at that level administrations are highly decentralised
Incentives to misstate evaluation results	If an organisation succeeds in saving money, telling others may result in their losing that money
Challenge of sharing results	Hard to get organisations to report unsatisfactory results
What you measure may become focus of organisation	If you measure number of services online, but not service quality, priority will be on putting services online but not on service quality

Source: OECD.

To overcome these barriers and monitor and evaluate e-government successfully, a number of issues must be addressed:

- A framework for assessment must be prepared prior to initiation, as well as a framework for evaluating efficiencies once the project is completed. The process to be improved or replaced by the proposed arrangements must be clearly defined. The project's full costs, including the costs of managing the associated organisational changes, also need to be identified. Furthermore, "success" needs to be clearly defined and if possible linked to the broader goals of the organisation and the national strategy. Both implementers and evaluators must agree on the definition of success.
- The knowledge that the evaluation may be used to determine the survival of the project or future funding creates a danger that the organisation's sole focus will be to meet specific targets. This is particularly a problem when the indicators for e-government evaluation may not be representative of the programme's goals. To the extent possible, *e-government indicators should be designed to reflect programme goals*.
- For an evaluation to be useful, *results need to be available to decision makers at the right time*. When information on longer-term outcomes is not available in the requisite timeframe, alternative indicators should be used. Evaluation procedures should be realistic and focused on specific issues of value. All

e-government evaluation will inevitably be a compromise between rigorous evaluation on the one hand and practical realities on the other.

- The *evaluation process should be unbiased and independent*, so that it can be used as a basis for revising e-government initiatives. It should also be non-threatening to participants. It should be general enough to apply to more than one agency, initiative or programme.
- E-government evaluations should be *based on a mixture of qualitative and quantitative indicators*. Qualitative indicators are useful because they may be better suited to some e-government benefits (such as improved quality of life) than quantitative indicators. However, qualitative indicators may be difficult to use when comparing projects and levels of success. Quantitative indicators are useful because they are more readily comparable and can be used to demonstrate concrete benefits. However, quantitative indicators are not always suited to e-government goals, and there is the danger of overvaluing their importance. As evaluation efforts become more advanced, there may be a greater reliance on qualitative measures.
- The evaluation process should take into account both *direct and indirect costs and benefits*. While indicators should be based on stated targets, they should also be flexible enough to take into account unexpected outcomes or be adapted for a later point in time.
- Finally, *e-government should be repeatedly evaluated* over time. The process should include preanalysis, implementation analysis and post analysis.

#### **CONCLUSION: The E-Government Imperative**

Whether challenges are "internal" or "external" depends on the breadth of view of the e-government leader. This is more than an intellectual exercise as it determines one's understanding of how e-government fits in with the rest of government, as well as with citizens, business and civil society. This larger governance issue is what many mean by the term "e-governance", but in fact it is not unique to electronic services and consultation; it is simply made more complex and pressing by a host of new ICT tools.

In the early phase of e-government development, individual agencies have tended to respond to e-government pressures by putting existing information online. For example, at the information provision stage, users can read and download publications as well as undertake limited inquiries and searches. All information flows from the administration to the user. Since this stage primarily involves the digitising of existing information and placing it online, it has so far required the least investment in process re-engineering and therefore can be undertaken with a minimal amount of planning.

As countries implement more advanced services, they are also most likely to encounter a host of new and more difficult e-government challenges. The use of new technologies makes apparent the inconsistencies in traditional stovepipe systems. The result is not only a need for increased co-ordination and collaboration, but for a re-engineering of the very systems of government. While agency innovation is still valuable, it will have to take place amidst more standards, decreased autonomy and tighter spending controls. While this will help some agencies, it may also be a source of frustration for others.

E-government is a clear priority for OECD countries, but to what extent are the lessons learned in these countries applicable to non-OECD countries? The answer is quite a bit. While questions of scope, approach and level of technology need to be determined by each country according to its own needs, achieving the cultural change needed within the public administration is a common challenge for all countries.

In fact, countries that are in the process of building their civil service may find themselves at an advantage in that they can incorporate new governance models into their civil service and legal system, rather than trying to reinvent old models. That said, the significant management challenges for delivering seamless services that have just been presented show how the blurring of roles and functions and the sharing of information and tasks makes it much more difficult to ensure internal accountability within the public administration. Before adopting sophisticated public management models, countries should make sure that they have an adequate supply of trained public sector managers.

Some developments may actually favour latecomers. In addition to learning from the e-government experiences of other countries, the breathtaking pace of the information society means that not only are technologies being tested and generalised, but a whole new generation is growing up with increasing familiarity with the Internet. Also, as e-commerce matures, e-government can also follow in its wake, piggy-backing on tested technologies, falling chip costs, infrastructure as it is established and new consumer confidence in electronic transactions.

E-government should be *value*-driven and not *technology*-driven. The promised benefits of e-governments do not take place simply by digitising information and placing it online. Instead, the challenge is to understand how the use of new ICT tools can be used to leverage a transformation in the culture and structure of government in order to provide better services to citizens. This entails determining the appropriate level of technology and service that meets the needs and the citizen preferences of a particular country; it does not mean importing wholesale systems and solutions regardless of whether citizens and businesses truly stand to benefit. Governments are beginning to understand better that real value can be obtained through the use of ICT, but that the need for basic assessments of benefits and costs, risks and opportunities remains.

## EMERGING TRENDS IN ICT DEVELOPMENT: A 5-10 YEAR VIEW

#### **Doug McGowan** President Suitelinq, Inc.

Over the last 10 years, technology has changed the way the world works, plays, communicates and shops. Many of these changes are seen the world over, some are restricted to more advanced countries. These changes have been so pervasive that it is hard to remember what the world was like without them. The questions that this paper will explore are: What will be next 5-10 years bring? Will the pace of technological advances continue to be high? Will new technologies make changes as fundamental as over the last 20 years? And lastly, how do companies and governments plan for these changes? In fact, can they plan for them at all? We will explore these and other questions in this paper. I intend to show that the pace of technological change is not the governing factor. Rather, the 'reach' and usability of the technologies and that they indeed, will drive some fundamental shifts in how we use technology. I believe you will find the future a very exciting one indeed.

#### A look at the past

Obviously, the range of new types of tools and appliance available to the average consumer has changed dramatically over the past 20 years. From microwaves to VCRs, from DVDs to cordless phones, from CD music to satellite and cable TV. It's hard to remember what it was like to live in a world without these convenient and useful products. Even in poorer countries, these technologies are taken for granted. Take a taxi around a city in the former Eastern European block and you'll see small satellite TV dishes mounted on roof tops and balconies of almost every apartment block you pass. In fact, if you describe to your children how you lived as a child, you probably won't be believed. My teenagers certainly cannot imagine a world without color television, rental movies, microwaves and the not. Amusingly, they assume that their parents lived just like people in the 19<sup>th</sup> century. That is, they assume that if you didn't have computers and VCRs, you probably didn't have electricity either.

Rather than looking broadly at all technological advances, I'd like to focus the discussion: We want to consider those technologies and inventions that impact how people communicate, work, and learn. For these are the technologies that are available to governments and citizens to improve the communication between them, to improve transactions (of all types) among them, and are used to inform and educate. With this restriction, the major categories of inventions now include: Cell phones, Personal Computer, Networks, Wireless networks, Interactive Television, PDAs and the like. This paper will focus on these and on the direction that these technologies will take in the future.

#### Issues with today's technology

#### The PC

Today, the PC is the most widely used computing device. It is not an exaggeration to say that the PC has indeed changed the world. However, for all of its success, there remain some serious issues with PCs. These issues are serious enough, in my view, that the PC will have to undergo significant changes in order to make computing truly pervasive and easily useful to everyone:

- 1. Windows interface. Although much improved over earlier versions, it is still complicated and hard to learn. Many people have difficulty using their computer, either at home or at work.
- 2. Security. PC's today have still have major security issues once they are installed on a network. (For example, the Windows XP based computer I'm using to write this paper has had >100 security patches loaded since December 2001.)
- 3. Data accessibility. If you put all of your significant work and personal data on a single PC, then you have to be at that PC to access any of the data. Once you're more than 6 feet from the PC, it becomes totally useless to you.
- 4. Upgradability. Every 3 years or so, most users find they need to replace their PC. This is a major hassle. Although it is easy enough to buy and install the PC (ignoring monetary issues.), it is another thing to get this new PC to be 'yours.' By this, I mean getting all of your data and applications migrated to the new PC. Some users don't even try. Instead, they keep the old PC around to access the old data and do new stuff on the new PC. I know people who have 4 or 5 old PCs in their home or office just for this reason!
- 5. Usability. As mentioned above, today's PC is much easier to use than older ones. (Remember the days, when understanding 'C:\autoec.bat' was important. Microsoft, and all application developers, have made major strides in computer usability. However, there is much more to do. These devices are still too intimidating to many people, especially older people.

It is interesting to note that children seem to be able to adapt to new technologies very quickly. For example, I have 2 teenagers at home and discovered that my youngest child has created her own web page—with absolutely no training from anyone. I asked her how she did this, and she gave me a puzzled look saying, of course everyone knows how to do it. Similarly, I watch in amazement as my kids use instant messenger. (For those of you who haven't used instant messenger, it's an application that allows you to instantly connect to your friend (buddies) who happen to be at their computer at the same time as you. You then can conduct a (written) conversation with them. What's amazing, is that you can conduct multiple conversations at once. I've seen teenagers who will be conversing with >10 other people AT ONCE and talking on the phone at the same time. I can't imagine keeping 11 or more conversations going at once!

#### Laptop Computers

Laptop Computers: Laptop computers have the same problems as desktop computers plus problems associated with travelling. Laptops, although relatively robust, still break with rough handling. Additionally, since 9/11/01, traveling with laptops has become difficult. There also is the issue of laptop theft in airports.

#### Wireless Networks

One of the exciting new developments is the deployment of wireless networks. There are 2 main types of wireless networks today: Cellular and WIFI (also called 802.11a/b).

- a. Cellular networks are used primarily for voice coverage along with very limited data capabilities. The main advantage of cellular technology is its long-range capability. In many parts of the world, (notably not including all of the United States), there is pervasive cellular connectivity available. In Europe and Asia in particular, users expect universal access to their cellular network. Users on some of the high-speed trains in Europe and Asia can even use their cell phones while travelling.
- b. WIFI is based on existing wired computer network technology (LAN). It provides very high speed but with a much short range of service. It is available in limited locations (commonly called 'hot spots'.) It does not provide voice communication, just Internet access. Additionally, WIFI access requires a specific device or a special add on to other devices (laptop and PC). Today, only a relatively small number of users have appropriate devices. However, the expectation is that this technology will gain very rapid popularity

Both of these technologies have issues today:

- 1. Cellular. Obviously, great for voice communication. Very wide acceptance worldwide. Today, only very limited (i.e., slow) data capability. All of the major carriers are working on next generation cellular technology that will dramatically increase the data capabilities. They are several years away. (If you hear terms like 2.5G and 3G, this is what they are talking about. 3G refers to third generation cellular, while 2.5G is 'second and a half' generation. Technology guys have a sense of humor too!).
- 2. WIFI. Excellent for data communication. This issue today is availability and cost. As the availability increases, I expect the costs to drop dramatically. (For example, to use WIFI at Starbucks today costs \$0.10 per minute or up to \$39.99 per month.) I expect it to eventually reach, less than \$9.99 per month for unlimited access)

#### Personal Digital Assistants (PDA)

PDAs are small devices sold by a variety of companies including HP/Compaq, Sony, and Palm. They can be loosely thought of as very small, limited functionality PCs. They do a very good job of storing contact lists and calendars. Some can be used to access email remotely (either by plugging into a network, using a pager network, or using the WIFI network). In order to make them fit easily in a pocket or purse; PDAs have very small screens and either no keyboard or a very small one. Therefore there are two major drawbacks: You can't display a complete page of text or graphics on a PDA and data entry, beyond short messages, is difficult or impossible.

In a sense, PDAs are devices stuck in the middle between PCs and Cellular Phones. As full function laptop computers become lighter and small and as PCs become more powerful, they will squeeze the PDA from both sides. Some experts predict that the PDA will eventually disappear. (In my view, rather

than disappear, they will morph into something else). Today, cellular device companies like Nokia and Motorola have introduced cell phones that contain mini-PDA's built-in. PDA manufactures have introduced PDAs will cell phone built it. Which is which? It is for the customer to decide.

#### **Rim** Pager

The last device I'm going to discuss is the RIM pager. This device may be unfamiliar to many readers. The RIM device is a next generation pager. It allows for the downloading of short email messages to the device over the pager network. The user can also enter short replies and send them with the device. The device cannot open attachments (word documents, etc.). Some models of the RIM device even resemble mini-PDAs with calendar and contact functions built in. Many RIM owners swear by this device. For me, it falls into the PDA category.

#### **Guaranteed Trends**

The objective of this paper is to describe technology trends that are 5-10 years out. However, a good place to start will be to list some of the important shorter-term trends. Many of these trends are essential in order for my longer-term trends to occur.

1. Pervasive wireless. Wireless technologies (both cellular and WIFI) will continue to develop. Cellular availability will increase until it is ultimately pervasive. The current multiple standards will continue, but phones will be able to access multiple networks. Because of this, users won't have to worry about which network they are on. However, this does mean that users will need to replace their phones over time. Luckily, users today tend to switch phones very frequently (about every 9months) so this shouldn't be an issue. (Compare this to how often users change PCs!)

WIFI will also become much more pervasive. You can expect that most public spaces (building lobbies, stores, shopping centers, restaurants, etc) will eventually have WIFI availability. As stated above, we should also expect the prices to dramatically drop over time. Lastly, most future PCs and PDS will have WIFI built-in.

- 2. Current devices (cell phones, PCs, laptops, and PDAs) will continue to improve. We can expect more powerful, lighter, and less expensive devices. Additionally, much R&D effort is being expended on developing longer lasting, lighter batteries. Better batteries will dramatically improve the usability and weigh to these devices.
- 3. The devices will continue to drop in price. Although it is somewhat hard to imagine, for the last 20 years a 'law' called Moore's (founder of Intel) law has held: Every 18 months the capability of a product will double at the same price and the price of a comparable device will drop in half.

4. Cellular Phones. I expect that cellular phones will become more specialized. There will be several types:

- a. Primarily voice communication. These are the ones that tend to be given almost free to new customers who sign service contracts.
- b. Voice and data communication. Phones with improved cameras for both still and video pictures are becoming available. (Today's cell phone cameras are fine for sending a picture to another phone. Most people consider them insufficient for sending a picture to a printer for enlargement. This will change!)
- c. Phones which include gaming and/or music capabilities (For example, Nokia has recently released the 3300 phone which includes a MP3 music player.)
- d. Phones which double as PDAs.

Again, for all types, prices will continue to come down while capabilities increase.

4. PDAs. As I stated above, I believe they will be subsumed into the cell phone and laptop categories. The same holds true for the RIM pages. I want to emphasize that this does not mean the current manufactures are in trouble. Far from it. Rather, I believe that these devices will converge in capability and each manufacture will differentiate their product offering.

These are nice but do not solve any of the more structural issues—ease of use, cost, support, etc.

#### 5-10 Year Predictions

I believe that over the next 5 years there will be a revolution in the computer industry that will dramatically change the way people understand and use computers. And, I want to emphasize the word dramatic. It will be an entire paradigm shift.

This shift is the change from "device centric" to "information centric" computing. What does this mean? Today, most people associate their information with the device that they use. If they use a desktop computer, then all of their data is on that computer. When they leave their desk (whether in the home or office), that data instantly becomes totally useless. Even laptop users associate their data with their device. Yes, the device is portable, but once it leaves your side, all of your information is unavailable.

This current way of thinking has lots of problems, from the obvious to the more subtle:

- 1. Desktop users are forced to carry paper or electronic organizers with them so that they can maintain their calendars and contact lists. All of this information is readily available on their desktops, but not when they're aren't sitting in front of their monitors. Adding a second or third device to your office equipment costs money and increases the amount of work you have to do to keep everything in sync.
- 2. People are forced to print lots of documents. Sometimes this is necessary because you need instant access to a document. Other times, it is a result of 'data paranoia': you carry it, just in case you need it.
- 3. You can't easily borrow someone else's computer. Sure, you can surf the web or check webbased email. But, if your company uses a more sophisticated email system, you're out of luck. Additionally, of course, you cannot access any of your text documents, presentations, or spread sheets. They locked 'safely' back at your desk.
- 4. When it comes time to replace your desktop with a new computer: Good luck. You have to manually move perhaps thousands of documents from your old computer to your new one. This is a non-trivial task for most of us, and certainly very time consuming. Because of this, many people are reluctant to move to new computer until they absolutely have to. Of course, this creates another potential disaster: You wait until your current computer dies. In the process, you risk losing all of your data (assuming you don't regularly back it up to a server somewhere—and most people don't!)

All of these facts result from the fact that you associate all of your information with your PC.

As I mentioned above, the paradigm shift will be from 'device centric' to 'information centric' computing. I think that the reader can now guess where I'm going: In the future your information will be (securely) stored on a server, not on your desktop. Therefore, as long as you know where it is, in theory, ANY device should be able to access it.

Some of you may have heard of a new technology called peer-to-peer computing. The idea here is that you can remotely access the data on your PC from another PC without going through a server. It's very neat technology –in fact is the same technology that allows the sharing of digital music (i.e., Napster). This technology is a piece of the puzzle—it allows sharing of data, but is insufficient for the vision I'm proposing. The problem with p2p (as it's called) is that your PC needs to on the network at all times-you must leave it on when you go home at night. It also means that you have to deal with the above issues such as managing your own data and making sure it get backed up somewhere. In summary, a very promising technology that is a great first step on the road to my vision.

WAIT, I hear some of you thinking: I need to control my data, I can't trust putting it on some server somewhere. Who can access it? Is it safe? What happens if the server crashes? Yes, these are important questions. I believe that the technology companies will be able to satisfactorily solve all of these questions over the next couple of years, the basic technology is available today, but it's not broadly used.

The solution to these questions will involve technologies that give you, the individual, a personal library to store all of your information. Think of this similar to a safe-deposit box at your local bank. You can rent a box for usually, a small fee per year. You can put important papers, jewelry, and even cash into this box. You can trust that the bank will protect your assets. The only people who can access your box are you, and sometimes, the government, with the appropriate judicial approvals. In some countries, these boxes are even anonymous. Unless you can present the correct 'credentials (keys, numbers, passcodes, etc.) NO ONE can access the box.

I foresee the time when you will be able to store all of your personal and professional data in an electronic equivalent of the safety deposit box. The data will be stored in an encrypted fashion (at least the important or private data, possibly all of it.). With current encryption technology, it is virtually impossible for an unauthorized person to access this data.

Some countries have been pushing for encryption schemes called key escrow. With a key escrow system, you are still the only person who has the electronic keys (passwords, etc) to access your data. However, there is a second way to access this data: When you created your password/key, the system automatically generated 2 'half-keys'. Bits of information that are useless by themselves, but when combined, can re-create your key. They 2 'half-keys' are then separated and stored in different places. (In the early U.S. proposals, the 'half-keys' were stored by 2 different government agencies. Only with a court order, could the 2 half-keys be combined.) Luckily, most government proposals for key-escrow have died. The horrific events of 9/11/02 have revived this issue though. My personal opinion, is that end the end, key escrow will die. People will not use or trust a system that can be abused by governments.

There are many advantages to central storage of all of your personal data. They include:

- 1. Anytime, anyplace access. As long as you have the right credentials (password, smart card, etc.) to access your data, it can be access from any appropriate device.
- 2. Better security. This is a huge advantage. You can now trust that someone is backing up your data. You will also be able trust that the data is stored on redundant servers that provide 99.999% uptime (downtime less than 1 hour per year). This is far superior to today's situation.
- 3. You can store more data than will fit on any single personal device. You don't have to worry about filling up your disc—although you may have to pay storage fees.

There is also an important downside:

1. On the downside, you have to make sure you have your credentials with you whenever you need to access your data. Overtime these credentials will most likely be a combination of password and biometric identification. An interesting question, is what happens if your lose or forget your credentials? Is you data gone forever? Although there is not yet agreement among the experts on this, I envision a scheme similar to the physical safety deposit boxes: If you can convince the bank that you are who you say you are (usually with a combination of signature, ID, personal knowledge, etc), then they will open the box for you. This usually involves destroying the lock on the box, and so it is an expensive undertaking.

The security field defines 3 methods to authenticating yourself: Something you have (like a credit card or passport), something you know (password, tax ID number), and something unique to you (finger prints, iris scans, voice scans). Most experts develop systems that use 2 of the 3 concepts: To get money from an ATM machine you need a card plus a PIN. Please note that authentication is a very different concept from identification. In authentication YOU tell the person/system who you are (account name) and then prove you are telling the truth with these authentication methods. In identification application the system does not know who you are. The systems tries to determine your identification by various means, such as fingerprints. Identification is a much more difficult problem than authentication. Because of this, most authentication systems have very limited use for identifying someone.

The bottom line is that if you know you could trust that your data was always safe and accessible to you (and you alone) from anywhere, then you would be no longer tethered to your PC.

#### **New Devices**

Once people begin to trust to concept of moving your data from your PC to a central storage place, the fun begins!

Imagine a world where any device can access your data whenever needed. This device can be one you own or one that you are simply using for a moment. These devices any be anywhere:

- 1. In your pocket
- 2. In your car
- 3. In your office or your colleagues office
- 4. In your hotel room

- 5. In an airplane
- 6. In a store or shopping center

Again, anywhere!

To simplify the discussion, let's divide the world of devices into 2 categories: Those you own and those you don't. Also, to help explain the revolutionary nature of these ideas, I will describe it in terms of a 'day in your life'.

#### Your Own Devices

It's 6:30am and time to get up. Your alarm clock rings. What's new, is that your alarm clock is now able to access your data. In this case, your online calendar. Your have to leave the house at 7:30 for your first meeting, and you've told your clock that you like to get up 1 hour before you leave. If this was a Saturday, then the clock would automatically let you sleep in, but wake you in time for your favorite sporting event on television.

We can imagine even more. Perhaps you are taking a business trip today. If so, the clock can access your travel record and find out what time your flight is. Should the flight be delayed it can let you sleep in. Or, if the traffic to the airport is particularly bad, it can wake you early so that you won't miss your flight.

This is a good example of how a simple device, an alarm clock, can provide better service (in this case, automatically adjust your wake up time) based on access to your personal information. As long as your information is stored centrally on a server, it will be easy for you to authorize a device (such as your alarm clock) to access the data.

It's now 7:30 and your get into your car. Your car now also has access to your personal data. The car checks your calendar as well as current traffic conditions. Knowing that your first meeting is at 8:30 at a client's office, your car's navigation system will suggest the best route. If traffic conditions change while you're driving, you will be given a modified route instantly.

Some of you may have used the navigation systems offered in some cars as well as add-on systems offered by some rental car companies. They are quite good. The main problem is that they are hard to program. It is difficult to enter your destination. In my example, this data entry problem is eliminated by giving the system access to your calendar. As long as your meetings are on your on-line calendar, you need not program the system at all.

Now, let's assume that you are a coffee drinker. Assuming you have told your car that you like coffee and have asked the car to suggest opportunities to stop at your favorite coffee shop, your car can monitor your progress to your meeting and if there is time, say: "You are making excellent time to you meeting. If you'd like, I can direct you to the nearest Starbucks. Please say YES OR NO".

Even better, suppose you answer "YES". Then your car can 'call ahead' and place an order for your favorite triple Latte as well as you estimated time of arrival and payment information. The coffee drink will be waiting for you when you enter the store!

#### **Devices You Just Use**

Now, let's take our fictional day, and add some application where we will use devices that we don't own. These devices may be anywhere:

Imagine that you now arrive at your first meeting location. Since you've arrived early, you want to check your email for new, important messages. In the lobby of the building you are at are several information kiosks. The may look like traditional PCs. You access one of the terminals and identify yourself. After authentication, up pops your favorite screen. This screen will show your email status as well as other personal data such as stock quotes, sports scores, weather, and of course, your calendar for the day.

There are 2 ideas in this scenario that are new:

- 1. After authenticating yourself, this kiosk will have access to your personal data. (This kiosk does not have to be on your company's network.) ANY kiosk will be able to access your personal data.
- 2. The screen that comes up is personalized for you. You define what information you like to see and in what format. You do this once. Once done, ALL devices that you access you display your data in this format, automatically. The only exception will be small devices with small screens or possible devices with no screens at all. In this case, the display will be automatically modified to fit the device in question. Again, with no work on your part.

#### At The Airport

Let's imagine that you need to take a business trip. You arrive at the airport and enter the airline lounge to wait for boarding.

You sit at a table and discover that there is a display mounted on the table. Great. You identify yourself and up pops your general data screen. What's different, it that in addition to the general information there is also a space at the top that lists your flight, departure time, gate information, flight status, and weather at your destination. Everything you need to feel comfortable that you know what is happening with your flight. If you'd like a drink, you don't need to wait for the server to come by. Simply enter your order on your screen and it will be delivered to you.

Now, let's go a bit crazy (I say crazy because I don't think this will happen very soon, but as a frequent traveler, I'd love it if it did).

Suppose you are about to board a long flight (3-6 hours or more). Today, most airlines offer you a selection of video programming to enjoy in route. Also, many airplanes, especially long haul ones, now have video screens at each seat. Well, what if you could select in advance, what movie or show you'd like to watch. What if there is a selection of hundreds of movies to choose from. Imagine being able to select the movies you want to see and have them instantly 'downloaded' to your seat. By the way, I would expect the airline to charge you for this feature (either in cash or possible, frequent flier miles, or perhaps, free to premium customers.). I don't know about the readers, but I would gladly pay a reasonable charge to watch the movies or shows that most interest me!

It should be obvious by now, that I expect the user to able to access personal information and use all of the typical office applications (word processor, spread sheet) while in the lounge if need be.

Unfortunately, sometimes things do go wrong. What happens if your flight gets delayed? Well, with these new applications, you will be informed at your seat in the lounge. You will have the opportunity to

change flights and inform your business colleagues of your new travel plans. All why enjoying your preflight drink.

#### At Your Hotel

In this section, I want to present one final example: Your hotel room.

Today, may business travelers bring laptop computers with them so that they can connect to their office while in their hotel. Today, these travelers (and the hotels) wrestle with several issues:

- 1. It is becoming increasingly difficult to travel with a laptop. Most airports around the world ask passengers to remove laptops from their cases, and separately x-ray them. There are also issues with laptop theft in airports. Finally, all of the jarring causes some laptops to break. And, again, in today's world, a broken laptop can ruin a business trip!
- 2. Once you arrive at a hotel, you must figure out how to connect the laptop to a network. There are 2 primary ways today, with a 3<sup>rd</sup> coming: Dial-up, broadband, and wireless.
  - a. Dial-up. The most common situation. It works, but is painfully slow. Additionally, dial-up use has caused major problems for the hotels. When hotels installed their phone system, they figured that most people make short (3-10 minute) calls and sized the system appropriately. Well, today that is no longer true. When people plug their laptop into the phone system, they may use the connection for anywhere from 15 minutes to several hours. This ties up the PBX system for everyone. Many hotels are forced to upgrade their PBX systems at great expense.
  - b. Broadband. An increasing number of hotels are providing broadband connections in each room. These offer connection speeds about 25 times faster than broadband, approaching the speed found in the office. Unfortunately, these systems are not easy to use. Many laptop users are not able to make these systems work. (I'm pretty technology savvy, and I have only a 50% success rate!) In fact, the typical usage rate of these systems in only about 2-4% per night. Because of this, some of the companies in the business of running these broadband networks have gone bankrupt.
  - c. Wireless. Many hotel are beginning to install wireless networks. They are a bit slower than the wired broadband connections, but still more than fast enough for most uses. The hotels are typically starting by installing the wireless network in the public spaces (lobbies, restaurants) and conference centers. Next will be the rooms. These systems should be somewhat easier to configure than broadband connections. It will be fascinating to watch the growth of this technology. (Today, of course, most people do not have a device that can work on a wireless network. New laptops and some PDAs now have wireless as standard, but it will be several years before these devices become the majority.)
- 3. Printing. It is generally difficult or even impossible for guests to print documents while in the hotel. In the best case, there is a business center in the hotel that allows users to plug their laptops into the hotel network and use the hotel printers. If not, then the user is out of luck (Yes, there are some users who carry portable printers with them, but they are a very tiny minority). Some hotels are experimenting with printers in the room. It a good idea, but difficult to implement. The difficult lies in the need for frequent replacement of printer cartridges and paper. The price of printer cartridges alone, is a disincentive to the hotel.

#### What can be done?

There are 2 new solutions coming to the market to help the travelling guest:

- 1. Some hotels are installing Internet access to the in-room cable/satellite TV systems. These systems typically work in conjunction with the pay-per movie feature. A typical system has a small wireless keyboard that works with the set-top box. Although these systems do indeed provide high speed internet access they have three problems:
  - (a) In many rooms, the TV is at the foot of the bed, not next to the desk. Therefore the user is forced to put the keyboard in their lap while sitting/reclining on the bed. This might be OK for short Internet surfing sessions, but is not useful for serious work.
  - (b) In some systems, the display on the TV is poor. This, in part, is due to the fact that watching TV and reading text on a computer screen are 2 different applications. The standard TV is not designed to do this well. (There are some systems that are trying to fix this.)
  - (c) Many people who work while in their hotel room also want to have the television on while they work. With an Internet system in the TV, you lose the ability to do this.
- 2. Some hotels are experimenting with the installation of a standard desktop PC on the desk in the room. This certainly fixes the problems with the TV set and can be an excellent solution. They only problem is that this is still 'old' paradigm and does not solve the data access problems we have been discussing

There is another serious issue with putting standard PC in 'public' spaces like hotel rooms, airport lounges, lobbies etc. The problem is related to support issues. Today's PCs install the operating system (Windows), applications, and all data on the local disk drive. As people use these systems, they store data on this same disk drive. As they surf the web 'cookies' are also stored on the hard drive. As they use email applications, there is the possibility of a virus attack on the computer. The sum of this is that after a week or so of use, a new PC 'looks' nothing like it did at installation. If the hotel were to install 100 of these in 100 rooms, then there would be 100 different 'looking' machines after a week. This is a support nightmare. (By the same, every large company/government has the same problem with its PCs (desktop and laptop). Every employee's computer 'looks' different. This is one reason PC support costs are so high.

Is there a solution? Yes. Instead of installing standard PC in a public space, install 'thin client' devices. A thin client device is a PC without the hard drive. Fixed applications (like Windows and applications) are stored in permanent memory on the unit. A users temporary data is stored in memory. All permanent storage is at a remote server. With thin-client devices, the device can be 'wiped' clean after each use. Each device stays exactly the way it was installed. The only downside is that the user loses the opportunity to store files on the device. This can be fixed by providing some storage to the user on the server. Of course, in the scenario I'm painting where all you personal data is centrally stored, this problem doesn't exist.

#### What About Television?

Thus far, I have been discussion new services delivered from computer-type devices. I have simply been taking the computing paradigm and adding new flexibility and usability to it. However, there is a very

important medium that I have not discussed yet: Television.

Television has had a huge impact on the world. For example, with the introduction of CNN, 24X7 news programming is broadcast into homes around the world. During the past 15 years, we have watched world events unfold in our homes. Also, over the past decade we have seen many improvements in television. A few include:

- 1. Wide-spread use of satellite and cable TV
- 2. The introduction of High Definition TV
- 3. Dramatic increase in the number of broadcast channels available to many homes
- 4. Better quality television receivers at lower cost

An exception: Some television shows now allows viewers to vote on various questions/contests by using their phone or leaving the room and going on line. For example, in the U.S. earlier this year, over 25 million people voted for whom should win the show: American Idol.

Although these changes have been very beneficial to many viewers, one thing has not changed: Television is still, primarily a one-way medium. The viewer selects a channel, and sits back and watches the programming. Today, there is virtually no 2-way communication. This will change.

We are seeing the early deployment of systems, which allow the user to directly interact with their television. For example, the Wink system, allows users to use their remote control (which communicates with a special satellite set-top box) to request information from certain programming which has been 'Wink' enabled. For example, a viewer might be interested in the weather for a particular city. He can tune to the weather or news channel and use his remote control to enter the city name. This will immediately display the weather information for the desired city.

Although the Wink system has limited use and reach today, I predict that this technology will gain widespread use and importance over the coming years. A major change will be that television advertisements will become interactive: Imagine watching TV and up comes an advertisement for, say, Coca-Cola. The viewer will be able to push a button on his remote control device to indicate that he is a Coke drinker. Coca-Cola will now be able to send an electron coupon to the user that he can redeem at the local store. The coupon can be sent to his PC and printed, or it could be sent directly to, say, his cell phone. The user could then display the coupon at the store and receive his discount. A very similar system is already in tests in South Korea. Users there can pay for purchases by using their cell phone as a payment device. They simply point their cell phone at the shop payment terminal, push 1 button, and the payment is complete.

These types of systems may sound interesting, but the key question is: What is the business case, which will drive the development and deployment of the system? I think the simple answer is: The advertisers. Today, television advertisers have no direct data on how many people view their advertisements and, of course, have no idea if an advertisement actually influences a consumer to make a purchasing decision. With these new television systems, this changes. Advertisers can receive direct information about who has responded to a particular advertisement: Time, city, channel, and most importantly, the advertiser will learn how many viewers actually redeem an electronic coupon and where/when it occurs. This is the type of data that advertisers have been dreaming about for years.

#### How This Changes The Way We Work And Play

In the last section, I painted my vision of how technology will work in the future. The important question now is "So what?" How will governments, businesses, and the public take advantage of these technologies to make their work or life more efficient? At the end of the day, if people and organizations do not take advantage of these technologies, then in a sense, nothing changes. We will now explore this. In order to organize my thoughts, I will describe the possibilities in order from local to global. I do this because I believe that changes start on a local level and only if proven, expand globally.

#### Community

My vision allows communities to make computing pervasive for their population. The first example is education:

Devices at all locations will be able to deliver e-learning tools to the public. Whether in schools, libraries, community centers, churches, or other meeting places, kiosks can be made available which not only deliver the learning tools but also can be customized to each user. (Each person's personal data is available so that content customized for each person's interests and abilities can be presented.). Some specific uses include:

- 1. School children will be able to access school assignment and research materials from any device in the community. They can see how they are doing in their classes, communicate with their teachers, pick up assignments, read enrichment material, etc.
- 2. Parents can have access to their children's grades, see if there are missing assignments, and have email access to the teachers.
- 3. Teachers will be able to have regular communication with parents and make enrichment material available for student's reading.

(One might argue that people can do this today. To some extent, I agree. However, not enough people have access to easy to use services to make this happen. This new vision will address this. Today, we have to assume the least common denominator—people do not have access. If we fix the access, we change how services are delivered!)

Similarly, at community centers or churches, people can have access to:

- 1. Job searching tools (resume builders, skill assessment tool, job opening databases, etc.)
- 2. E learning tools.
- 3. Community services: Communicate with city/town services (school, planning, police, permits, news, etc.)
- 4. Entertainment. Films, concerts, community events.
- 5. Volunteerism. Communities looking to recruit volunteers to all types of positions can easily recruit and train new volunteers.
- 6. Many more.....

#### What does this mean for governments?

If my vision is correct, in 5-10 years many more people will be connected than today. They will use the Internet for all aspects of their lives. This means that they will expect that the government will communicate and work with people using Internet technology. No longer will government web sites be sufficient. People will EXPECT more from their governments. (A similar example is telephone answering machines or voice mail systems. In many parts of the world, people EXPECT that an answering machine or voice mail system will respond when a person is not available to take a call. They would be incensed if a businessperson did not have voice mail available.) Computing moves from a tool for the rich and educated to a standard part of life. Governments MUST use these tools; there is no choice.

What will people expect?

- 1. Visibility of government actions
- 2. Ability to transact business online
- 3. That the government will use technology to gather inputs from citizens
- 4. Improved responsiveness

The bottom line is that as business and the public use new technology to improve their business and lives, they will expect the government to use these same technologies?

#### Challenges

This will not be easy. All transformations take time, money, expertise, and most importantly, patience. It will not happen overnight. It will require structural changes within the government. (Technology will not provide a magic pill. It will provide ever improving and exciting tools, but they have to be accepted, implemented, and used.)

At the same time, there are several issues, both technological and governmental, that will have to be addresses:

- 1. Security and Privacy. Unless citizens trust the security of the technology these use and understand how their data might be used, they will never truly trust the systems. This problem exists for businesses in general today. It is probably worse for governments. Government policy, laws, and regulations are needed to define how both the private and public sector will use this technology and how individual rights will be protected.
- 2. New applications will need to be developed. Many will be naturally developed by the private sector. Governments will need to invest in adapting these technologies to public use.

In summary, I envision a world where technology will be used to improve everyone's life. Where everyone has access to the information and services to help them achieve their fullest potential, Where government can provide information and services to improve the lives of their constituents. Where information flows in both directions-from the citizen to the governments and back. Where there is an increasing quality of life for everyone.

Technology will advance. New products, capabilities, and services will be created. Computing will indeed become as pervasive as the television or telephone. It will happen.

It's up to you to decide how you want to use these advances to improve the lives of your countrymen. The opportunity is there. Will you take it?

# ANNEX I

# Agenda

## 5 November 2003

9:00 - 9:30	Opening of the Workshop and Presentation of Conceptual Framework
	Jerzy Szeremeta Chief, Knowledge Management Branch DPADM / UNDESA
	The main question of the Workshop is: "Among the many difficulties encountered by the e-government developers, which can be solved by more advanced technology and which must be solved by reform and change in public administrations?"
9:30 - 11:00	Session I
	The main objective of session one is to come up with a list of difficulties encountered by the e-government developers, regardless if they are of technical or non-technical nature.
	<b>Chair:</b> Joao Carlos Ferraz Director, Division for Productive and Entrepreneurial Development ECLAC
	Keynote presentation:
	"Sources of difficulty in e-government development"
	Edwin Lau, OECD e-Government Programme
	Country perspective:
	Julio Cesar Margain, General Coordinator of the National e-Mexico System, Ministry of Communication and Transport Mexico
	Regional perspective:
	Gabriela Baez, Senior Analyst Pyramid Research

#### Thematic perspective:

Ichiro Shinkai NTT Data Research Institute for System Science

- 11:00 11:30 Break
- 11:30 12:30 General Discussion
- 12:30 14:30 Lunch

#### 14:30 – 15:45 Session II

The main objective of session two is to identify the currently readily available ICT solutions that can help alleviate some of the difficulties encountered by the developers of e-government applications, exchange experiences in this regard.

**Chair:** Joao Carlos Ferraz Director, Division for Productive and Entrepreneurial Development ECLAC

#### **Keynote Presentation:**

#### "Innovation and Quality in Government for the 21st Century"

Alexander Ntoko Chief e-Strategy Unit ITU

#### **Industry perspective:**

Michael Marks Director Service Provider Market Development, Concord Communications

#### **Country perspective:**

Anna Mikadze-Chikvaidze Executive Secretary, Presidential Council for Development of ICT Georgia

#### **Country perspective:**

Abraham Sotelo Chief, Electronic Government and IT Policy Unit, Ministry of Public Function Mexico

15:45 – 16:15	Break
16:15 – 17:15	General Discussion
Day Two	6 November 2003
9:00 - 11:30	Session III
	The main objectives of session three is to come back to the ICT perspective on e-government development and to see new possibilities that the quick technological progress would offer to e-government developers in not so distant future.
	Chair: Jerzy Szeremeta Chief, Knowledge Management Branch DPADM/UNDESA
	Keynote Presentation:
	"Emerging Trends in ICT Development: A 5-10 year View"
	Doug Mc Gowan, Former General Manager for Hewitt Packard's Innovation Centres and Mobile Professional Solutions Organizations
	Industry perspective:
	Chris Roberts Industry Manager E Government Global, Microsoft Corporation
	Country perspective:
	Li Kai, CEO, China Economic Information Network, Co. Ltd. China
	Country perspective:
	Raymond Khoury TCU Director, Office of the Minister of State for Administrative Reform Lebanon
	General discussion
11:30 - 12:00	Break

#### 12:00 – 12:45 **Presentation of conclusions: "What have we learned?"**

Jerzy Szeremeta Chief, Knowledge Management Branch DPADM / UNDESA

> Discussion will follow a short summary of the findings and conclusions of the three sessions of the Workshop. It will be aimed at pinpointing areas in which ICT and its further development can bring a positive difference to e-government development or where only internal administrative change and reform can help.

Discussion and closing of the Workshop

#### **ANNEX II**

#### List of Self-nominated and Invited Participants

Ms. Rachel Andrade-Sankar Project Coordinator Information and Communication Technology Unit Office of the President Guyana

Eng. Jared Baraza Member National ICT Task Force Telkom Kenya

Mr. Amadou Ousmane Diallo Counsellor Office of the Prime Minsiter Mauritania

H.E. Mr. Abderrazak El Mossadeq Office of the Prime Minister Ministry of the Economic Business, The General Business and the Setting to Level of the Economy Kingdom of Morocco

Mr. Atman Ram Ghimire Executive Director National Information Technology Centre Ministry of Science and Technology Nepal

Ms. Rita González Planas General Specialist National Office of Information Ministry of Information and Communication Cuba

Ms. Nomathemba Hlope Director Public Service Management Programme Ministry of Public Service and Information Swaziland

Dr. Samuel Wodi Jimba Director Website and Internet Services Nasarawa State Government Nigeria Dr. Raymond Khoury TCU Director Office of the Minister of State For Administrative Reform (OMSAR) Lebanon

Mr. Li Kai Senior Economist China Economic Information Co. Ltd. State Information Centre China

Ms. Ariunaa Lkhagvasuren Director of Civil Society Programs Foundation for Open Society Mongolia

Ms. Anna Mikadze-Chikvaidze Executive Secretary Presidential Council for Development of Information and Communication Technologies Georgia

Ms. Fuatai Purcell Secretary Samoan ICT Committee Ministry of Communications and Technology Samoa

Mr. Luis Sanchez A. Executive Director Commission e-Panama Panama

Mr. Danilo Torres President Committee for E-government Sao Tome e Principe

Mr. Sangay Wangchuk Deputy Director Division of Information Technology Ministry of Information and Communications Bhutan

Ms. Khedija Zammouri Director General Director of Administrative Reform Office of the Prime Minister Tunisia

#### Participants who were invited and were not able to participate

Mr. Abel Caine Manager Business and Systems Development responsible for E-government ITC Service Ministry of Finance Fiji

Mr. Estanislao C. Granados, Jr. Director Procurement Service Department of Budget and Management Philippines

Ms. Litang Suharto Senior Advisor Minister of Information Technology Ministry of Communication and Information Indonesia

Mr. Petan Mognihazi Counsellor Communications of the Vice President In Charge of the Ministry of Justice, Information, Religious Affairs and the Rights of Men Comoros

#### ANNEX II

#### Presentations

Un Modelo de Participacion Digital en el Camino de Mexico hacia la Sociedad de Información Julio Cesar Margain y Compean

New ICT and Democracy - E-Democracy in Japan Ichiro Shinkai

Innovation and Quality in Government for the 21st Century Alexander Ntoko

Microsoft in Government Chris Roberts

Some Institutional Thinking in e-Government Development - Chinese Case Study Li Kai

Emerging Trends in ICT Development: A 5-10 year view - A Discussant's Perspective Raymond Khoury