

## **The Status of Information and Communication Technologies (ICT) in Governments – 2006:**

An Analysis of ICA Country Reports for the 40<sup>th</sup> Annual ICA Conference

### **Executive Summary**

Last year, the 2005 ICA Country Reports documented how members were beginning to look inward to address the governance models, systems architectures and business processes needed for governments to become truly citizen-centric. Having placed transactions and services online as part of the first wave of e-government strategies, governments were approaching the limits of what traditional public administration models could accomplish with ICT.

This year's Country Reports show governments continuing down the same path as last year. Governance models are further centralizing functions, encouraging collaboration and standardizing policies. Systems are continuing to be viewed in the context of government-wide architectures, with consolidation of common systems and shared services slowly bringing those architectures into the real world. The goal remains to use ICT to create greater value for citizens, and value is being defined ever more broadly to include social and economic goals. These trends, which have been reinforced in the last two years of ICA Country Reports, have led some to adopt a new vision for government, which forms the theme for the 2006 ICA Conference—Whole of Government.

**Governance** – Governance of ICT continues to evolve toward greater centralization of ICT management and functions. Collaboration continues to be encouraged, with an even stronger emphasis on collaboration across sectors to create networked government. International collaboration as well is factoring into ICT governance. Finding the right array of skills to work within this new model remains a concern. Performance measurement and budgeting tools continue to be used to create accountability across agencies for government-wide priorities and standards. Procurement is a much larger point of emphasis for countries within the 2006 Country Reports, with many examples of government efforts to create more efficient contracting vehicles that deliver greater value. Meanwhile, new strategies in several countries support increased centralization and consolidation of functions while broadening the focus of ICT beyond simply improving services to improving the quality of life for citizens and being more responsive to citizens.

**Systems** – Government systems are continuing to be consolidated according to common functions. Shared services are gaining traction. Business processes are being formalized and automated to a greater extent to enable systems to work intergovernmentally. Communities of interest are coming together to build data standards to allow for interoperability. Enterprise architectures have become commonplace, and all of the aforementioned work bring them one step closer to existing in the actual configuration of government systems. Identity management, including authentication applications and smart cards, remains a major building block to be put into place. In addition to architectures, old and new issues present challenges and risks to managing government systems. Many governments are taking steps to convert to Internet Protocol version 6. ICT is of particular importance in emergency planning efforts and as a piece of critical infrastructure. Governments are starting to take open source more seriously in systems development. And

finally, geospatial services are gaining importance within government as similar tools become more popular with the public.

**Citizen Services** – Governments remain focused on using ICT to create value for citizens. In the 2006 Country Reports we see the definition of citizen value expanding from efficient services to include many other facets. ICT is seen as a potential means of increasing democratic participation, social welfare and economic opportunity. Internally, governments are continuing to integrate services to citizens to create a more seamless experience. Governments are looking for ways to become more interactive, in line with the preferences of a population that is becoming increasingly accustomed to using social networking sites and collaborating online. For the services already launched, governments are trying to increase access; either by increasing awareness of services already in place or addressing hard-to-reach populations to reduce the digital divide. Finally, governments are expanding delivery channels to wireless access devices and other channels.

The trends of centralization, enterprise architectures and integrated services show governments moving closer to the Whole of Government vision. Yet the 2006 Country Reports show that centralization and architectures are accompanied by more complex collaboration between levels of government and sectors of society and shifting preferences among citizens. A larger and more complex government must provide information and services in a multitude of ways. Government must work as one and yet be more flexible. Governments are expanding the goals for ICT use beyond mere service delivery improvements, figuring out how to serve the public through new devices and interfaces, and trying to be flexible enough to deal with emerging technologies and emergencies. The underlying tension can be thought of as Whole of Government vs. Agile Government. The need for improved management of the back-office favors a Whole of Government approach, while the emergence of wireless access and new devices perhaps calls for the flexibility and innovation of Agile Government.

The ICA Agenda reflects the tension. The agenda covers both “Whole of Government” solutions as well as the concept of “Agile Government.” The question as to whether more centralized management and coordination of ICT can coincide with greater flexibility and innovation is an important consideration as governments move forward.

The following report is based on the observations, strategies and initiatives featured in eighteen ICA Country Reports submitted for the 40th ICA Conference: Australia, Belgium, Canada, Denmark, Estonia, Finland, Ireland, Israel, Korea, Malta, Mexico, the Netherlands, New Zealand, Portugal, Singapore, Taiwan, the United States, and the United Kingdom. Selected initiatives and strategies from these reports will be highlighted throughout this document. All quotes within this report refer to the Country Report of the nation responsible for the initiative being described. The ICA thanks the authors of the reports for their valuable contributions.

### **The Status of ICT in Government: An Introduction**

Governments have embraced the citizen-centric approach to providing services. The first era of Internet-enabled E-Government saw the launch of national portals and services such as taxes, permit applications, fee payments and government forms. Governments also are providing multi-channel services; integrating phone, web, e-mail, and in-person delivery channels to offer better and more consistent services.

Despite the progress, the transformation to a fully citizen-centric government has not been possible because of organizational and budgetary constraints. Architectural building blocks needed to be in place to facilitate the transition. Efforts to make the front-end more seamless highlighted deficiencies in the agency-centric business processes that make government work. More than a new service delivery channel, the definition of E-Government has broadened to include all activities that ICT can support. Below is an update of international progress toward the Whole of Government vision in terms of governance of ICT, systems use, and citizen services.

### **Status: ICT Governance**

In ICT Governance, we see new strategies reframing priorities and setting new goals. ICT management and government functions in general are becoming increasingly centralized. Collaboration, across agencies and sectors of society, is powering Whole of Government approaches. In order to operate in this changing environment, new types of management and managers are necessary. We also see a renewed emphasis on procurement as a critical piece in ICT Governance.

### **New ICT Strategies**

The first wave of E-Government strategies expressed support for and defined E-Government, identified priorities and flagship initiatives and promoted citizen-centric models. Now that governments have reached the limits of the status quo, a new wave of strategies is emerging in governments to support ICT use. New strategies are geared to facilitating transformation, adopting Whole of Government approaches to ICT management, setting goals of greater responsiveness and interaction, and adopting new social and economic goals.

Australia has adopted a new strategy called Responsive Government. The strategy seeks to allow for information sharing across agencies and sectors to enable all users to upload data only once and transform business processes. By 2010, Australia hopes to meet its vision of:

- meeting users' needs;
- building connected service delivery;
- achieving value for money; and
- enhancing public sector capability

Canada has developed a follow-on approach to its successful Canada's Government On Line (GOL) and Service Improvement (SII) initiatives. The Public Sector Service Value Chain ties together employee engagement (i.e. satisfaction and commitment) and citizen/client satisfaction with public services and citizen confidence as drivers E-Government performance. The program will align internal and external government investments through common architectures, shared business processes and management standards.

Japan has also adopted a new 5-year strategic plan, "New IT Reform Strategy". The new strategy focuses on renovating business processes and systems as whole of government by implementing enterprise architecture. The strategy also seeks to accelerate online use with setting a target of more than 50% online use for all national procedures by March 2011, which remains around 10% at present.

Estonia is embracing the varied goals of government use of ICT with its overarching "Information Society Development Plan 2013," expected to be completed in the fall

of 2006. The plan emphasizes social and economic goals in addition to institutional goals. The three goals are

- Every member of the society will have the possibility to use all benefits of the Information Society;
- Wide use of ICT is the engine of economic growth of Estonia;
- Public sector is citizen-centric, transparent and effectively functioning.

Issued on 15th of June 2006, Finland's new ICT strategy, the Government decision-in-principle on Development of Government IT, set strategic targets for ICT, identified areas within government that can be harmonized and consolidated and created flagship projects. Finland reflects the paradox of the Whole of Government approach. The strategy sets strategic targets that emphasize flexibility of services while project and programs emphasize consolidation and harmonization of ICT within government.

New Zealand is updating its ICT strategy to take a decidedly more interactive focus on transformation and participation. By leveraging new uses of technology for social networking and collaborative work -- including use of wikis and blogs -- New Zealand hopes to improve the quality of government and citizen interactions.

Portugal has adapted the broader goals from the Lisbon Strategy that was established in Europe in 2000 to its ICT efforts. In "Lisbon Strategy – Portugal Anew: National Action Program for Growth and Jobs (PNACE 2005/2008)," Government ICT investments are intended to aid the "modernization of the Public Administration; promotion of scientific and technological development and innovation; and improving the qualification model in order to obtain a lifelong learning culture and access to the knowledge society."

Highlighted in last year's summary report, the United Kingdom's eGovernment Unit (eGU) has further established itself by developing a Transformational Government Strategy that emphasizes a client focus, a shared service delivery environment and professionalism of the Government ICT workforce. Service Transformation includes

- IT Strategy and Policy
- Identification and Authentication
- Data Sharing
- Standards and Technical Policies
- Working with Local Government
- Working with Suppliers
- Directgov (portal)

Long a leader in ICT, Singapore has updated its strategy with the iGov2010 Masterplan. The plan has four main thrusts that encompass goals for engagement, service delivery, efficiency and economic development. The thrusts are: "Increasing Reach and Richness of e-Services; Increasing Citizens' Mindshare in e-Engagement; Enhancing Capacity and Synergy in Government; and Enhancing National Competitive Advantage."

#### Greater Centralization

The trend toward recentralization we saw in the 2005 Country Reports is perhaps even more pronounced in the 2006 reports. In 2005, governments were centralizing the oversight and management of ICT atop an agency-centric landscape beneath.

Centralization of ICT management is continuing, with organizations being established to steer much of the consolidation and enterprise architecture efforts underway in governments. In 2006, we see that centralization is also beginning to filter down to the agencies and programs that deliver services. Centralized agencies and programs are being created to manage common functions across agencies.

Highlighted in last year's summary report, Finland's KEIKU program is continuing to work towards consolidation of its financial and personnel management functions. Offices from over 100 agencies will be consolidated into five service centers by 2010. Four service centers are already up and running. The State IT-Services Unit, which will develop shared solutions and facilitate a Whole of Government approach to services, is also planned and should be operational by 2007.

Korea is centralizing ICT management into two National Computing and Information Resources Administration (NCIRA) Centers. This is a shift from the agency-centric approach to systems management in the past. ICT functions in 48 agencies will be consolidated into the two service centers. The first will be completed by the end of this year and a second by the end of 2007.

Portugal is also reorganizing how it approaches ICT. Among the initiatives shaping this reorganization is the creation of institutions to manage shared services across common functions across agencies. Also, an agency for Administrative Modernization will be created within the Prime Minister's cabinet to guide cross government efforts with special emphases on interoperability and data standards.

The UK has created a centralized authority to manage the transformation to Whole of Government service delivery. The Delivery Council, a sister body to the CIO Council, began meeting this summer and functions as a cross-government team that can work toward "the development of common agendas on delivery issues." The Delivery Council replaces the Service Transformation Board and brings together leaders of programs responsible for service delivery

#### ICT Skills

The development of technical skills and skills necessary to manage ICT is still a high priority for governments. Managing complex ICT projects requires technical expertise and skills in collaboration and project management. To acquire the unique blend of talents necessary to manage ICT in a government setting, governments have embarked on a variety of projects to professionalize ICT management and develop technical skills within government. Last year's reports highlighted initiatives by Japan, the UK and Estonia in particular. This year, we see additional governments emphasizing the importance of ICT skills.

Australia has created an apprenticeship program that allows students to gain qualification and certification for ICT work as part of its ICT Professional and Skills Development Taskforce. The program is meant to address the disparity between the demand for ICT skills in government and the supply of skilled workers.

Canada is building an IT Community HR Framework that standardizes technical competencies, skill sets, job descriptions and other job related materials for the ICT workforce. The goal is to have improved mobility and transparency within the government ICT workforce and hiring process.

Ireland is shifting its HR policy in ICT. Rather than relying on "on-the-job" training, Ireland is developing a certification process that involves training of applicants as a gateway to ICT employment. The benefits of this approach are that it would enable prospective employees that have not had formal training in the past to get comprehensive ICT training. This addresses the scarcity of skilled ICT workers available to government. It allows Ireland to tailor training to a government context.

#### Collaboration/Networked Government

Governments continue to rely on collaboration as the primary vehicle for realizing the Whole of Government vision. Collaboration with the private and non-profit sectors to achieve social and economic goals with ICT is being emphasized. Vertical (across levels of government) and horizontal (across agencies) collaboration remains a key to achieving integrated services and implementing enterprise architectures. The notion of networked government is an exceedingly complex one. Governments are still working out the division of labor between each sector, agency and level of government. International collaboration is also gaining emphasis for governments, especially in Europe. Common international problems have led some countries to collaborate on approaches while international bodies and standards making bodies continue to impact national strategies. This collaboration is starting to be complemented by funding and accountability structures that are intergovernmental and cross-sectoral as well.

Australia places a premium on cross government collaboration in executing its ICT programs. Several bodies manage ICT for the government and include members across levels of government. For example, the Online and Communications Council (OCC) addresses ICT issues that impact all Australian jurisdictions. Members include Ministers from the Australian and state governments, as well as representatives from the Australian Local Government Association (ALGA). Another example is the Cross Jurisdictional Chief Information Officers Committee (CJCIOC), established in August of 2005. The CJCIOC works on issues of "trusted and connected government, skills and sourcing, shared services, project management and service delivery measurement."

Canada also has several interjurisdictional bodies that guide ICT, including the Public Sector Chief Information Officer Council; the Public Sector Service Delivery Council; the Municipal Information Systems Association of Canada (MISA); the Institute for Citizen Centered Service; the Deputy Ministers' Inter jurisdictional Meeting on Service Delivery Collaboration; the annual Lac Carling Conference; and the Crossing Boundaries National Council. Similar to the UK's Delivery Council, The Deputy Ministers' Inter-jurisdictional Meeting on Service Delivery Collaboration met in June of 2006 and convened leaders of "single-window" service agencies in the federal government and Canadian provinces and territories to consider the potential for further collaboration across levels of government. The group agreed to develop a collaborative agenda for service agencies across Canada. Canada is also beginning to look ahead to cross-sectoral collaboration in the context of a service-oriented architecture. Their vision of citizen-centric service delivery includes private and non-profit entities. A Service-Oriented Architecture will eventually allow for the integration necessary for citizens to interact through any entity via their preferred delivery channel.

Currently, there are 33 government organizations participating in the provision of services through the Hungarian Government Portal. Of most importance is the provision of electronic access to the 20 basic services (27 in Hungary) specified by

the European Union, which cover about 80% of the total number of administrative matters. A central administration provides an electronic administration interface through the ClientGateway. It has an authentication function, to manage an ever increasing number of administrative matters electronically. In May 2006 these services were used more than 3 million times.

Mexico has created an Inter-Ministry Commission for Electronic Government Development to guide Digital Government. Its mandate is to "foster and consolidate the use and enjoyment of the Information and Communication Technologies." It facilitates collaboration across levels of government and sectors of society. Among its goals are:

- "To support the search for financial resources to carry out IT projects"
- "To foster the establishment of coordination and collaboration mechanisms with the federal branches, the Attorney General, the federative entities and municipality governments, as well as with public and private institutions, either national or international"
- "To propose the establishment of the Federal Public Administration's (FPA) technologic architecture"
- "To foster the establishment of inter-operability mechanisms"

In Finland, they are collaborating to ensure that all health information, whether from public or private sources, come from one source. A working group established by the Prime Minister's Office is supporting work on a shared national database of health information, which will be implemented by the National Insurance Institution. Similar collaborative effort will take place among the 431 municipal ICT offices later this year.

Korea created the Administrative Information Sharing Committee in November 2005. Led by the Prime Minister with members including twelve ministers and experts from academia, the committee will collaborate to "reduce redundancy and provide citizen-oriented government services" in the management of the 74 types of administrative information identified by Korea.

The Netherlands has created a "consultative structure" to implement e-Government programs across municipalities, provinces, and water boards. The levels of government have collaborated to develop a joint administrative implementation agenda for reducing expenses and improving services. The jointly developed agenda included a timeline of implementation phases and a division of labor between the levels of government.

#### Performance Measurement and government-wide accountability

Performance Measurement and government-wide accountability instruments are continuing to be developed by governments that wish to entrench citizen-centric and Whole of Government approaches to ICT use. Feedback from citizens is a crucial piece for governments attempting to measure performance. Adherence to government-wide strategies remains a motivation for these tools as well.

Belgium has set up a framework to measure e-government progress that will assess the degree of strategic contribution, potential benefits and degree of urgency for ICT investments. Korea has also set up a 'Performance Management and Inspection Plan' to measure e-Government performance. Three measures are important in determining e-Gov success – efficiency, use of services, and customer satisfaction

Feedback from citizens should be a major factor in measuring the quality of e-Government services. The U.S. and Singapore have innovative approaches for gathering and utilizing such feedback for performance measurement. The U.S.'s Online Agency Performance Assessments is part of the Program Assessment Rating Tool (PART), which is a "standard questionnaire with approximately 25 questions about a program's performance and management." Assessments are posted online for the public to see at [www.ExpectMore.gov](http://www.ExpectMore.gov). Answers to the survey are factored into analyses of how well agencies are doing with their online services. Singapore conducts periodic Customer Perception Surveys, with the most recent occurring in March of this year.

#### Procurement

With the increasing reliance on public-private collaboration to achieve social and public goals, procurement issues have gained importance for governments. In this year's country reports, we see governments trying to streamline and improve procurement processes to reduce duplication, work better with private partners and coordinate efforts across agencies. Some procurement functions are becoming more centralized, while some are trying to standardize procurement processes to ensure that government systems work together in an increasingly integrated government environment.

Australia published its Guide to e-Procurement in June of this year. The document's purpose is to "assist and encourage agencies to develop e-procurement options, understand business cases, and develop e-procurement plans that suit their needs and the needs of their suppliers."

Demark has created a Public Procurement Toolkit for ICT purchases. The guide is online and provides guidance on issues such as accessibility standards and procurement policies. The goal is that agencies will use the toolkit when defining business requirements for ICT purchases. Requirements for software, websites and hardware can be generated automatically through an 8-12 question survey that can be filled out online.

In Ireland, they have embraced framework contracting for ICT. The ICT Framework Steering Group, established by the Centre for Management and Organization Development in the Department of Finance, is developing a consolidated procurement vehicle for ICT products. Representatives from several agencies sit on the group. The initial framework resulted in five qualified vendors for PC's that any agency could use. Other framework procurements are being developed.

Finland has just passed a law that allows the Ministry of Finance to mandate that agencies use joint procurement contracts entered into by the central procurement authority, potentially centralizing procurement functions.

#### **Status: ICT Systems**

Governments are beginning to actualize the government-wide architectures that have been designed. While enterprise architectures still exist primarily in budgets, plans and strategy, increasing use of shared services and consolidation of functions are bringing those architectures into reality. A web services oriented architecture seems to be the ultimate goal for many government systems. Business processes are being further refined and formalized to enable integrated service delivery and the Whole of Government approach. As architectures guide government efforts, ID management remains the most critical to-do for government systems, and this

year's reports show a variety of approaches from smart cards to authentication schemes. Protection of systems inside and outside of government remains a priority. There are many initiatives to improve Internet security, protect systems as a piece of critical infrastructure or deal with emergencies should they occur. New uses for geospatial information and the success of programs from the private sector are leading many governments to improve GIS capabilities. Conversions to Internet Protocol version 6 and refined strategies for use of open source are also major efforts in some governments.

#### Identity Management

ID management remains a top priority for governments and perhaps the most important initiative across countries. Authenticating users with a single ID that enables them to receive services across all agencies is a necessary piece to achieve the Whole of Government vision. Authentication is becoming a common shared service across government agencies. Smart cards are a major component of many governments' ID management strategy. Electronic ID's, with and without cards are being implemented to create a trusted environment for integrated services so interaction can be seamless and secure. Registries that enable governments to authenticate users across government are being implemented as well. And finally, citizens have certain expectations of privacy when using government networks. Many governments are taking steps to protect the privacy of users.

Belgium's Electronic ID card (e-ID) is the quintessential example of a smart card approach to identity management. The e-ID includes a picture, National Register number, signature and other identifiable data in a physical and electronic form. Citizens can use the e-ID smart card for authentication to access services and as a signature. Despite the card's many capabilities, government is careful not to include unnecessary data on the card to avoid the perception that government is tracking citizens. Approximately 3,500,000 cards have been issued and new cards tailored to kids and foreign residents are also being launched.

Denmark is grappling with a federated approach to identity management for public interactions. A debate over whether or not to have more than one standard for a federated identity management approach took place within the government. However, the government is moving forward with the SAML 2.0 as the standard language to allow for cross-sector authentication and cross-organizational consistency. Five documents with recommendations were submitted for consultation in the autumn of 2005, and the OIO Enterprise Architecture Committee has subsequently approved them as common public recommendations. Moving ahead, a level of trust among the agencies participating in the federated approach is a prerequisite for it to work.

Israel is creating three smart cards – "Tamar", "Tamuz", "Telem" – for citizens, business and government. These smart cards will authenticate users of government services, store user data or access data from other sources. Smart card based authentication and digital signature through the cards for each of the groups is expected to be implemented by the end of this year.

Australia is also taking smart card-based approach to identity management. Earlier this year, a smart card framework that outlined strategic principles and guidance on smart cards and related technologies was released. Smart cards are being developed to enable cross-sectoral and intergovernmental interoperable identity management. Within government, cards being developed are the Health and Social

Services Access Card, which will consolidate information and access from 17 different cards onto one, and a Queensland smart driver's license.

The U.S. is undertaking a massive initiative to standardize government ID's used internally by employees in response to Homeland Security Presidential Directive 12 (HSPD-12), Policy for a Common Identification Standard for Federal Employees and Contractors. This large mandate goes into effect in October of this year and will require agencies to acquire the necessary hardware and applications to adhere to the standard. Employees will use the ID by to enter federal buildings and computer systems.

Portugal's Citizen Card (Cartão do Cidadão ) is a smart card designed to serve as an ID card, bank card, social security card and health card. The card will enable authentication and digital signatures and allow for multi-channel services.

The Netherlands is also creating a smart card based e-ID program. Electronic functionality will be added to the national ID card by the end of year and the organization and legal structure to run the program should be put into place during 2007. The test issuance of cards occurred in March of this year and cards will continue to be rolled out until 2009. The Netherlands is especially attuned to the privacy implications of such a card and have taken measure to protect citizens, including:

- Protecting citizens' rights regarding use of personal information online.
- Not including fiscal, health or social security data, on the card and keeping it located in the specific agency providing the service.
- Protecting access to card data by requiring user consent
- Not allowing the reconstitution of citizen data.

As one of its government-wide shared services, Finland's VETUMA service is an authentication and payments application shared by all agencies and jurisdictions. The service allows for two authentication methods: Internet- banking authentication and National IDcard. This approach leverages the strong authentication already used by banks. Plans are to allow for authentication using mobile phones in future phases.

#### Government-wide Architectures

Many governments have implemented government-wide architectures over the past few years. The 2006 Country Reports show that governments are refining those architectures, with a special emphasis on business processes and data standards. Many governments have begun defining and formalizing business processes across government boundaries to enable Whole of Government solutions. These are being automated through middleware applications to enable systems integration. Data standards are being adopted by governments, with a reliance of open standards developed by international and private bodies. Shared services are helping to bridge the gap between the reality of disparate agency-centric systems and the framework of government-wide architectures. These shared services are the first step to a broader movement towards a web services enabled, components-based architecture that will support the Whole of Government approach. This year's Country Reports contain many examples of government consolidating functions shared by multiple agencies and providing them to the Whole of Government. Shared networks and systems are beginning to transform government organization themselves, as agencies are being created to manage these shared services.

Some governments are beginning to create organizations to develop and guide the new business processes necessary for the Whole of Government approach. Australia has created The Business Process Transformation Committee (BPTC) to "provide assistance and technical advice to help coordinate business process improvement initiatives." The BPTC will advocate for service delivery reform by providing a guide for integrated services over multiple delivery channels. A series of reports that establish frameworks for information interoperability and technical interoperability are guiding the transition as well. Canada has also created a tool kit known as the Business Transformation Enablement Program (BTEP). The BTEP includes a Canadian Strategic Reference Models (GSRM) and a methodology for transforming services.

Service oriented architectures (SOA's) are key conceptual pieces in the shift to Whole of Government use of ICT. Denmark is facilitating the adoption of a service oriented architecture across government through the transition. Recommendations for SOA's that were offered in a 2003 White Paper on Enterprise Architecture guide their efforts. Canada also has a strategy for implementing a service oriented architecture to integrate service delivery. They have created a SOA reference model to standardize their use.

Denmark also has a variety of other initiatives including a Standardization Guide that documents common ICT technical, data and process standards in Government. An innovative approach to standards development, Denmark also created a Consultation process for standards to be adopted as part of the Danish e-Government Interoperability Framework (OIO catalogue). The Framework includes background on over 600 standards used by government, an Architecture Guide, Architecture Classification, Component Library, Data Standardization and an Information Architecture.

Estonia's X-Road provides the infrastructure for all agencies to perform common data processing operations. All agencies can query common shared databases and documents repositories that store the information used to power government services. The X-Road includes 64 databases in powering government services; 363 institutions and companies using it and; 921 different services.

U.S. has expanded the Lines of Business approach noted in last year's summary report to include new shared lines of business for ICT Infrastructure, Geospatial data and Budgeting. Also, the final reference model for the Federal Enterprise Architecture, the Data Reference Model (Version 2.0) (DRM), was issued. The DRM's "primary purpose is to enable information sharing and reuse across the Federal government via the standard description and discovery of common data and the promotion of uniform data management practices." It standardizes government data in three areas, Data Description, Data Context (i.e. taxonomies and categorization) and Data Sharing standards.

By the end of March 2006 Japan had completed its plans to optimize government-wide business processes and systems in 76 areas, which could be reducing operational costs by about 1.1 billion per year. Under the new strategy, systems are to be updated or newly developed only when (1) they contribute to administrative and financial reform, (2) they are based on an appropriate framework including an optimization plan, and (3) they expand users' convenience.

Singapore has embraced a web services strategy to foster shared services and integrated service delivery across government. The country's Web Services Development and Deployment Programme, has created a Policy on Web Services Management in the Public Sector and a Government Web Services Exchange (GWS-X) platform. The goals of these policies and pieces of infrastructure is to "integrate services with other agencies and/or private sector organisations in real-time, and in an efficient and secured manner." Singapore has implemented 57 government Web Services, and, as of this year, all of which are available on Government Web Services Exchange platform.

The Netherlands has created a new organization to manage the implementation of shared services across government, GBO.Overheid. The organization will eventually become an independent agency responsible for providing common services across government. Basic services such as Data routing, DigiD, and PKI already are being consolidated in the agency with others soon to follow.

New Zealand approved the creation of a Government Shared Network (GSN) in mid-2005. The GSN offers a "networking platform" for online services and facilitates intergovernmental collaboration through the use of security and information standards. "The State Services Commission was charged with delivering a shared infrastructure that addressed these and other requirements in a manner that has direct relevance to the delivery of efficient and effective public services."

Last year, the summary report highlighted Israel's Merkava project. MERKAVA is a "government-wide enterprise resource-planning (ERP) tool that will automate the business processes for common functions across agencies." Common functions include finance, human resources, procurement, logistics and management control systems. Plans are for all agencies to use the shared services by 2008. Continued development for MERKAVA is scheduled through 2009.

#### Security, Emergency Planning and Critical Infrastructure

Protecting government systems and the privacy of citizens that use them remains a high priority for governments. Many governments are undertaking efforts to improve not only the security of government systems but also the security of private and personal networks. ICT supports key pieces of critical infrastructure and is itself a piece of critical infrastructure. Many governments are doing what they can to protect their systems and the processes they support. Emergency Planning helps governments prepare for possible disruption and was highlighted in several country reports.

Denmark has undertaken a project on IT security in the government sector. They are standardizing the ICT security process. A working group known as the Government IT Security Working Group is guiding implementation of the program. They are also revising their emergency planning for ICT based on recommendations in a recent report issued by the National IT and Telecom Agency, "Framework for a future and strengthened emergency planning process in the IT and telecommunications area" (title translated from Danish).

To ensure that government business is conducted in a secure environment, Canada has created a Secure Channel as a secure infrastructure for programs using ICT across all levels of government. One of the benefits of such an infrastructure is that information and services can be shared between agencies and jurisdictions with little to no additional security risk. There are six secure channel services: external

Credential Management; Receiver General Buy Button; Secure Message Routing Service; Internal Credential Management (ICM); Federated Infrastructure National Directory Service (FINDS); or Secure Encrypted Automated Logon. All agencies in the federal government are already using the at least one Secure Channel service.

Estonia is concerned with ICT security and has created a new initiative, "Computer protection 2009" to address it. Run by the Look@World Foundation, the programs included in the effort are Card-based authentication for online services and a computer security web resource for the public to discuss and learn about computer security. The initiative is cross-sectoral and was initiated by banks, and ICT companies in the private sector.

Singapore had developed an Infocomm Security Masterplan and several initiatives to protect cyberspace. The master plan includes a Business Continuity Readiness Assessment Framework and an awareness program targeting government employees. They see security and infrastructure a key enablers of their iGov2010 strategy. Among the other projects are a National Cyberthreat Monitoring Centre (NCCM), a Critical Infocomm Infrastructure Surety Assessment (CII-SA) and an Infocomm Security Health Scorecard (SHS).

#### Geospatial

Citizens are becoming increasingly reliant on and accustomed to using geospatial information. Being a natural repository for geospatial data, governments are improving the integration of geospatial data into their service offerings. Repositories of geospatial data are being compiled to better manage government property and resources.

Estonia has created the Public Sector Infrastructure for Spatial Information based on OpenGIS standards. The infrastructure includes a network of data servers in which geospatial data reside and software that allows users to have an integrated view into the data. Data standards enable the sharing of geospatial information. The program will simplify the work of citizens and government employees that rely of geospatial information through automated data-processing tools, and federated databases. Using the x-Road as a backbone, this program will evolve into an "interoperable nation-wide geo-information system."

Built to leverage the MERKAVA architecture, Israel has created the Magal program to integrate its enterprise system with geographic information. A pilot done by the housing authority was successful. Magal's goals are to "improve planning capabilities, determining a GIS policy of decision making at all government ministries, local authorities and other public organizations" and "establish standards...so all users will define the same geographic entity and location, synonymously."

The key registers implemented by the Netherlands, highlighted in last year's summary report, also contains several registers of geographic data. Such registries include the Large-Scale Base Map of the Netherlands (LBMN), the Land Registry and Topography, the Netherlands Geological Information Databank (NGID) and the Buildings and Addresses (KRAB) Registry.

#### Internet Protocol Version 6 (IPv6)

Though the standard has been around for many years, governments are now developing migration strategies to make sure their systems can interoperate on the

IPv6 platform in addition to the current IPv4. IPv6 allows for a greater number of network addresses, which will accommodate the increase in the number of devices used to access private and public Internet services. Governments, already grappling with providing services to new devices and delivery channels, are preparing for the gradual migration to IPv6.

Australia, Denmark and the U.S. have all addressed the migration to IPv6. The U.S. in particular has a very specific approach to use IPv6. "Agencies are required to ready their network backbone to transmit both IPv4 and IPv6 traffic, and support IPv4 and IPv6 addresses, by June 30, 2008. Agencies must be able to demonstrate they can perform at least the following functions, without compromising IPv4 capability or network security:

- Transmit IPv6 traffic from the Internet and external peers, through the network backbone (core), to the LAN;
- Transmit IPv6 traffic from the LAN, through the network backbone (core), out to the Internet and external peers; and
- Transmit IPv6 traffic from the LAN, through the network backbone (core), to another LAN (or another node on the same LAN).
- The requirements for June 30, 2008 are for the network backbone (core) only. IPv6 does not actually have to be operationally enabled (i.e. turned on) by June 30, 2008. Agencies had to meet 2006 deadlines to develop a transition plan, a transition impact analysis and an inventory of IP-aware applications and peripherals with dependencies on network backbone."

#### Open Source and Standards

Historically, governments have waded cautiously into the question of whether or not to use open source solutions in government systems. This year's Country Reports show some governments beginning to take a stand. Spurred by the flexibility and control it can provide to governments increasingly reliant on the private sector to deliver service, some governments have taken an active role in using and developing open source solutions. Still, there is hardly a consensus regarding to what extent open source solutions should be used.

Holland and Denmark have all made statements in support of open standards and software use by government. In Denmark, the parliament adopted a resolution (B103) that states that government has the duty to use software based on open standards and sets a deadline of the beginning of 2008 (or as soon as technically possible) for government to adopt a set of open standards. In support of this mandate, the government created the National Center for Software Excellence earlier this year to support the use of open source solutions in government. In the Netherlands, the national policy regarding open standards is "to use open standards as far as possible for data interchange between government agencies, members of the public and businesses, and to agree how data are to be used by multiple users." They established a Government Standards Board and a Standardization Forum earlier this year to aid in the adoption of standards.

Australia, on the other hand, is taking a more cautious approach. They have adopted a policy of informed neutrality. Decisions regarding whether or not to use software are based on value and business need. If an open source solution meets those criteria, then it is used. They are surveying agencies at this time to learn about agency experiences with open source. Malta has a roadmap for adoption of open standards as part of its e-Government strategy, but notes that while strategy embraces its use, implementation is far more complicated.

**Status: Citizen Services**

Since governments began adopting e-government strategies, a focus on the citizen has always been the driving force. Governments are still driven by desire to create value for the citizen. Value is no longer narrowly defined by improved service delivery. Governments have adopted social and economic goals for ICT use along with more efficient and seamless service delivery. Governments are beginning to take cues from popular use of social networking sites to connect citizens to each other and officials in government. Governments are becoming more interactive and consultative. The use of wireless devices continues to increase, and governments are adjusting their strategies for service delivery to keep pace. Governments continue to strive to increase access by increasing awareness of government services and trying to reach underserved populations.

**Broader Goals – Economic, Political and Social**

Citizen services used to refer primarily to government's role as a service provider. Governments are expanding the role of ICT beyond better service delivery to include social and economic goals as well as goals for civic and political engagement. Many government strategies make reference to larger social goals to improve the quality of life for citizens. Some view ICT as an engine of economic growth in their communities. In addition to existing applications that enable citizens to comment and consult on policies and regulation, some countries are now creating forums in which citizens can network and coordinate to influence government and contribute to the community. ICT is being used to create a more responsive and activist government that can improve the quality of life for its citizens.

Estonia is an early adopter of e-Voting as a means of citizen participation. Local government elections nationwide employed e-Voting in October 2005. Used in parallel with other voting methods, e-Voting is supported by an electronic ID card and Internet voting tool. "More than 80% of eligible voters (1.06 million) had the national ID card and were able to vote via Internet." About 2% of the total votes cast were e-votes.

Governments are beginning to invest in online services that enable citizens to network and communicate amongst themselves to improve the community and government. Ireland's mobhaile ["my home"] has been created by the Local Government Computer Services Board (LGCSB) and Information Society Fund. The service allows community and volunteer groups to work together online to build community capacity. Mobhaile allows citizens to:

- search for businesses, services, things to do and places to visit
- locate places on the map
- send SMS texts and eCards
- register business/service/group details if not on already on mobhaile.ie
- save previous searches and location for future use on the site

Israel's "National Committee for Technology for the information Society" is a cross sectoral collection of officials that looks at ways to use ICT to achieve the social goal of the state. For example, the Shachar program seeks to use ICT to "improve the capabilities of the workers and managers in welfare services, in all authorities, to handle those requiring service." This is done through a portal that service providers can access information needed to make decisions on welfare cases. The committee has also created a "business development team" for technology that develops ICT projects that can spur economic growth.

Malta is setting economic goals for ICT by creating a technologically advanced and hospitable environment to support business development in ICT based industries. The SmartCity@Malta' seeks to attract companies to the country. The initiative is expected to create about 5.600 jobs. Malta has also made a concerted effort to attract iGaming firms to the country. Over 70 companies have registered in Malta because of its supply of skilled labor and technical infrastructure.

Singapore is also using ICT to improve the quality of consultations with citizens. The Government Online Consultation Portal ([www.feedback.gov.sg](http://www.feedback.gov.sg)) allows groups such as businesses to offer input in policy decisions and provides online spaces where these groups can interact with government and each other. These consultations can also be conducted via mobile phones. Singapore has received over 50,000 consultations online. Further using ICT to support social ends, the Youth Portal ([www.youth.sg](http://www.youth.sg)) was created in February of this year as a portal for community participation. "It offers young Singaporeans easy access to information on how to start their own community activities, as well as information on initiatives that fellow youths are engaged in." A similar e-community has been created for overseas Singaporeans.

#### Multi-channel/Wireless

Multi-channel service delivery continues to evolve for governments, with special attention to reaching the increasing number of users of wireless devices. M-Government, the theme of last year's ICA Conference, remains one of the most important factors impacting government. The entrenchment of new channels for service delivery and the shifting citizen preferences that accompany the use of new devices creates an exceedingly complex environment in which governments must provide information and services. Citizens are becoming increasingly reliant on cell phones as their primary devices, replacing the traditional computer. Text messaging is replacing e-mail for some forms of communication. As web-enabled devices and access points multiply, it could create a complicated array of channels, where many constituencies have many preferences.

Because of the 100% penetration of mobile phones, Estonia is creating a suite of m-Gov (wireless) services in its second largest city, Tartu. Among the services provided:

- Mobile parking - clients of all Estonian mobile operators can pay for parking via their mobile phone
- Mobile bus ticket - there is an ID-card based ticketing system in Tartu, which also includes paying for bus tickets via mobile phone
- T-number - allows one to receive information on Tartu's sightseeing via mobile phone: there are 90 audio-clips for different tourist attractions. It is also possible to send an SMS to a short code 17120 and a mobile positioning device provides the sender with the codes of the closest objects
- Mobile payments - possible to use a mobile phone for paying for products and services - in some taxis, shops and restaurants
- Tartu City Short Code - short code 1789 is currently used as a way for citizens to provide the city with information about broken traffic lights of street lamps, damaged traffic signs, stolen park-benches etc.
- M-teacher - provides teachers with the interface to send text messages to the parents with important information needs to be forwarded
- M-neighborhoodwatch - taxi, and bus drivers, security companies and other active people can participate in making Tartu safer by receiving SMS-

notifications on issues (missing persons, stolen cars etc.) that require watchful eyes. Messages are sent by police control center and all Tartu taxi, bus, and security companies are included in this project.

- M-library – if person wants to borrow book, movie or audiotape which is currently not available, she can register and receive SMS when it becomes available

In Ireland, many departments are offering Short Messaging Service via mobile phones. For example, the Department of Agriculture and Food allows users to subscribe to updates on the mobile phone by topic of interest. Also, the Department of Revenue offers similar services that citizens can use to claim a number of tax credits; change their address; order certain forms and leaflets; and, check the progress of any written contact. Using this service requires prior registration with Revenue.

Israel is implementing a multi-channel solution as part of its G2C Management System. The system supports integration of the channels by allowing users to initiate and track requests from any channel – web, e-mail, phone, or fax. From the government's standpoint, data regarding citizen interactions are tracked and managed in a standardized way using a centralized system rather than implementing separate solutions. The system will "decrease service request processing time, audit exceptions, supply feedback on status of requests, and escalate severity of request without forgoing responsibility and post request fulfillment auditing."

The M-Taiwan project seeks to provide wireless broadband across the island and develop government online services via mobile phones. The billion dollar project builds broadband, while developing and promoting wireless services. Additionally, their approach is to expand "access channels for providing information and services to citizens," including digital TV, mobile phones or PDA. Similar to Tartu, Estonia, Taiwan is also creating a Wireless City in Taipei: Wireless penetration is 90% as of July 2006, and the city has made great progress in creating broadband-wireless infrastructure and implementing online services for mobile phones.

Mexico is also looking into the expansion of government services to mobile devices. Currently, "the President's Office, CONACULTA (National Art and Culture Board), and ISSSTE (State Workers Social Security and Services Institute)" among others offer information services that can be sent to mobile phones. Mexico also uses RSS (Really Simple Syndication) in services from the President's Office, SAGARPA (Ministry of Agriculture and Fishery) and CONACULTA to provide syndicated content. Over the next two years, the Lagos de Moreno e-Hospital will integrate the use of Wireless devices, Intelligent ID Cards, Radio frequency pagers into a large healthcare system to support the hospital.

#### Digital Divide/ Increasing Access

Despite the high levels of Internet penetration, some citizens still have limited access to the Internet and are underserved by online government services. With the evolution of new delivery channels via wireless devices, the divide could potentially worsen. Therefore, many governments are using public resources and money to provide Internet access to underserved populations. Not only does access differ among populations, but so does the ability of users to effectively use online services. Governments are developing some strategies to help citizens become more efficient and savvy in their use of the Internet.

Belgium is promoting greater access and savvy use of the Internet through a variety of programs. Goals of the programs include lowering entrance barriers, particularly in using e-ID Cards, and raising awareness of online threats and security issues. For example, S.DAYS attempts to raise public awareness of threats associated with spam, viruses and phishing. Young people are a particularly important group to protect in light of predatory behavior online. Safe Chat and Suske en Wiske are two initiatives designed to raise awareness among youth of online dangers and provide them with a protected space to interact online. To address the digital divide, the "Internet for all" program provides computers "a PC, a smartcard reader, internet connection, PC training package, security software" to those that cannot access them.

Denmark has made great efforts in improving the accessibility of government services. Denmark develops maps documenting the State of Inclusion. This map addresses "the accessibility of public web pages, the cost in relation to creating accessible and inclusive solutions and an inclusion check on the most commonly used ICT tools in the public sector." Also, the Center of Excellence IT for All has begun a web design competition to create the most accessible website. The Center also provides guidance and research on accessibility that other agencies can use in developing accessible systems.

Ireland has created an eInclusion Fund to make sure that no one is left behind due to the digital divide. Focusing on high risk groups, Ireland provides funds to "foster communities of common interest through on-line services and networks."

In addressing the Digital Divide, Taiwan has surveyed the public and found that those in remote areas and indigenous people were less likely to have Internet access. Projects have been developed to address the digital opportunities for elementary and junior high schools and the handicapped, among others. The Handicap-free Websites initiatives promote "handicap-free websites and set up Web Content Accessibility Guidelines 1.0 in accordance with the Web Accessibility Initiative of W3C." The Internet Use in Remote Areas program has created access centers in rural areas to get people using the Internet and online public services. There are currently 233 centers.

Even with its advanced approach to e-Government, Singapore is concerned with access issues among its population. The government began the CitizenConnect program in October of 2005. The pilot set up five CitizenConnect Centers at community clubs to allow those without access to use online government services. Among CitizenConnect users, "95% expressed satisfaction with the facilities provided; 96% were satisfied with the help provided; and 92% stated that they will use the Internet to transact with the Government in future."

Portugal offers a tax reduction for computer purchases to facilitate use of home computers. In an effort to reduce the digital divide, the government linked all public schools to Broadband Internet. The program was successfully completed in 2006. As with Singapore and Taiwan, Portugal has also created public access spots that allow users to access online government services. In 2005, 35 new access spots were created in 2005, and the goal is to double the amount by 2008.

#### Improvements to Citizen Services

Governments are also adding functionality to existing service offerings, creating an integrated environment that citizens can use to receive seamless citizen-centric

services. Some governments are beginning to develop push technologies to work with citizens. Others are reassessing the quality of government portals to deliver better citizen services.

Canada's service delivery approach is continuing to evolve through Service Canada, an integrated service delivery network that offers multi-channel, one-stop access to government services. The goal is to provide seamless access to federal services with definite plans to expand to provincial and local services later. Service Canada develops new service offerings based on research and analysis of user needs and specific needs of client groups.

The Japanese government portal site, "e-Gov" saw many improvements in 2005 by expanding link to other public entities and consolidating the systems of the same functions across the ministries. To strengthen PR and to take in citizens' perspectives, the government appointed "Grassroots e-Gov Facilitators" from civil society including lawyer, accountants and opinion leaders. Approximately 250 facilitators were appointed in 2005 and they are playing a role by encouraging citizens and businesses to go online as well as advising government from the users' point of view.

Denmark is realigning its approach to portals. The Government has decided to establish a reference model and architecture for portals to encourage reusability and interoperability of online services. Among the solutions shared are single sign-on, remote portlets, security, information architecture and service level agreements. This model was part of a larger effort by the national, local and regional governments to create a Citizen Portal. The goal of the Citizen Portal is to consolidate information and services across all levels of government in one place. The project was initiated in the spring of 2006 by the Steering Committee for Joint Government Cooperation (formerly known as the E-Government Board).

Taiwan has embraced push technologies to provide services as part of its e-Housekeeper service, which will be fully implemented by the end of 2006. The system "will serve as a gateway to integrate and exchange needed information for the various agencies in order to provide citizen-centric service." Citizens will eventually be notified via a number of channels about services or events such as electricity bills, parking fines, vehicle registration services and property registration.

### **Conclusion**

Governments are continuing down the same path as last year and gradually implementing Whole of Government strategies. In Governance, we see a new wave of government-wide strategies that promote centralization and cross-government and cross-sectoral collaboration. In systems, enterprise architectures continue to evolve, with the number of shared services and integrated services increasing. While countries are looking to Whole of Government approaches, increasing complexity and shifts in technology and user preferences require great flexibility and agility on the part of governments. Citizen services are evolving in terms of their purpose and mode of delivery. The difficulty comes in maintaining flexibility in a more centralized and complicated environment with many players involved. Governments will need to reconcile how to centralize and integrate while maintaining enough flexibility to deal with numerous partners in and out of government, technological changes and social shifts.