2010 United Nations Public Service Day - Awards and Forum
21 - 23 June 2010, Barcelona, Spain

Workshop 3
E-GOVERNMENT DEVELOPMENT AND KNOWLEDGE MANAGEMENT IN GOVERNMENT

PRESENTATION:

THE ROLE OF PUBLIC SERVICE IN ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS

National E-government Strategies: Application of ICT in Government in Achieving the Millennium Development Goals

by

Dennis Anderson, Ph.D.
Professor of Information Systems
ICT Expert
Pace University
USA

June-Suh Cho, Ph.D.
Associate Professor of MIS
School of Business
Hankuk University of Foreign Studies
Seoul, Korea
Abstract

Information and communication technologies (ICTs) have transformed the world we live in and governments are no exception to this transformation. In the private sector, particularly in e-commerce, we have seen how ICTs were used to reach out to and build relationships with customers. While governments have followed the private sector in adopting technologies, until recently, there was no national strategic planning. Having a national strategy on ICT in government and e-government can significantly reduce government waste, corruption, and inefficiency. Some governments are opening up to citizens via e-government and others are learning from successes and failures as they build their own e-government portal. The United Nations Department of Economic and Social Affairs through the Division for Public Administration and Development Management (DPADM) has provided support to member states for intergovernmental processes, comparative policy research and analysis, education and training, and advisory services related to e-government. This paper discusses the three levels of e-government and national strategies to reach the tertiary level: a citizen-centric participatory e-government.

1. Introduction

The first electronic computer was invented in the 1940s, but few today would recognize it as such, given its enormous physical size and limited computational power. A few decades later, it is almost impossible to imagine a world without computers. Even the founder of IBM, Thomas J. Watson Sr. could not imagine the transformational power of
computers, predicting, “I think there is a world market for maybe five computers.” The invention of computer networks and the Internet, has changed everything from manufacturing to news media to banking. Especially in the last two decades, computers, the Internet, and telecommunication technologies, collectively known as information and communication technologies (ICTs), have made this transformation possible. This first wave of the Information Technology Revolution is similar to the Industrial Revolution, in which the private sector has played the predominant role in accelerating change, i.e., from the bricks-and-mortar traditional business model to the click-and-mortar e-business model.

Even with all these technological advancements, the public sector and governments have been lagging behind in adopting and taking advantage of the benefits. (Hirschheim & Smithson, 1999; Irani, 2002; Irani & Love, 2001; Jones et al., 2007; Remenyi et al., 2000; Willcocks & Lester, 1999). There is general acceptance that with the right strategy and application of ICTs, governments can be more efficient and provide better services to their citizens. This paper will examine strategies for e-governments and how effective application of ICTs can improve government services for citizens and help achieve the United Nations Millennium Development Goals.


At the turn of new century, in recognition of global poverty, the 192 United Nations member states agreed to eight global goals known as the Millennium Development Goals (MDGs) “which range from halving extreme poverty to halting the spread of HIV/AIDS
and providing universal primary education, all by the target date of 2015.”¹ The eight goals include the following:

- Goal 1 – Eradicate extreme poverty and hunger
- Goal 2 – Achieve universal primary education
- Goal 3 – Promote gender equality and empower women
- Goal 4 – Reduce child mortality
- Goal 5 – Improve maternal health
- Goal 6 – Combat HIV/AIDS, malaria and other diseases
- Goal 7 – Ensure environmental sustainability
- Goal 8 – Develop a global partnership for development

In order to make concrete progress, 18 targets were identified. According to the 2009 MDG Progress Report, some progress has been made on some goals but most targets are either “progress insufficient to reach the target if prevailing trends persist” or “no progress or deterioration.” (MDG Annual Progress Report 2009, Statistics Division of the United Nations Department of Economic and Social Affairs) The UN Department of Social and Economic Affairs highlighted the following shortfalls which were based on the 2009 Annual Millennium Development Goals Report.

- In Sub-Saharan Africa and Southern Asia, poverty remains stubbornly high. The number of ‘$1/day poor’ went up by 100 million in Sub-Saharan Africa during 1990-2005.

¹ http://www.un.org/millenniumgoals/bkgd.shtml
- The declining trend in the prevalence of hunger observed since 1990-92, was reversed in 2008, largely due to reduced access to food because of high food prices and the global financial and economic crisis. The highest hunger prevalence in 2008 was in sub-Saharan Africa, where 29 per cent of the population was undernourished.
- 72 million children of primary school age around the world — about half in Sub-Saharan Africa — remain out of school.
- Five years after the deadline, the target of eliminating gender disparities in education by 2005 has yet to be achieved.
- The child mortality rate in developing countries fell from 99 deaths per thousand live births in 1990 to 72 in 2008. This is well short of the target of a two-thirds reduction (to 33 per thousand live births). Based on current trends, many countries are unlikely to achieve the MDG health targets by 2015.
- There has been little progress in reducing maternal deaths – in developing regions, maternal mortality only declined marginally from 480 deaths per 100,000 live births in 1990 to 450 in 2005. At this rate, the target of 120 deaths per 100,000 live births by 2015 cannot be achieved.
- The progress has not yet been enough to reverse the trajectory of the HIV epidemic because needed interventions on prevention and treatment often fall short in coverage: for every two persons starting anti-retroviral treatment, there are five new HIV infections.
- The rate of growth of CO2 emissions has been much higher during 1995-2004 than during 1970-1994, and the trend has not changed so far.
- Donors are falling short by $35 billion per year on a pledge made in 2005. The share of ODA in GDI was 0.3 per cent in 2008, far from the agreed target of 0.7 per cent to be reached by 2015. Distribution of ODA remains highly skewed. Iraq and Afghanistan received about a sixth of country allocations from DAC countries, but account for less than 2 per cent of the total population of the developing countries.

- Gap in access to internet between the developed and the developing world remains large. In 2007, there were only 13 users per 100 people in the developing regions, as compared to 64 in the developed regions. The digital divide also remains wide, both among and within countries. (The Millennium Development Goals: A Snapshot, UN Department of Economic and Social Affairs, 2010)

There is a great sense of urgency given that only five years are left to remedy these shortcomings and achieve the MDGs. In order to reach the goals, there has to be a global effort to invest resources, including funding, public-private sector partnerships, human resources, education and training, knowledge experts, and ICTs. Governments, along with civil societies, NGOs, and educational institutions must work together to achieve the goals. Governments must be transparent, accountable, and accessible to curb corruption, ensure resources reach the needy, serve citizens better, and create a sustainable environment. ICTs have an important role to play in this process. For example, a carefully planned resource management system can help deploy resources to the needed population and resolve problems in a targeted manner. ICTs can help governments tackle system-wide corruption and facilitate reform towards more open, transparent, and
accountable governments. Indeed, some of these changes are already taking place in the form of e-government.

E-government was popularized during the dot-com era in the 1990s. The emergence of e-commerce and Y2K\(^2\) advanced e-government, as governments began to adopt the changes taking place in the private sector. E-government is defined in various ways. (Relyea & Hogue, 2004; Seifert & Relyea, 2004) Some definitions of e-government are limited as a unit of the government, while others are very broadly defined, with e-governance integrated throughout the government. World Bank defines e-government as “the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government.” (Jeong & Kim, 2003; Kushchu & Kuscu, 2003; Trimi & Sheng, 2008) These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. (Gronlund & Horan, 2005; Reddick, 2005; Tian & Tianfield, 2003) The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.” (Definition of E-government, World Bank\(^3\))

E-government is increasingly being implemented in areas of government administration at both the local and national levels, increasing efficiency and transparency and bringing

\(^2\) The total cost of Y2K was “revised to $1 trillion or more. Reuters recently reported Jeffery Boonmee, founder and president of Bicom Link, as saying Y2K is now a $3 trillion global industry, and that in the United States alone, the market for Y2K solutions is worth about $800 billion.” (The True Cost of Y2K, Smart Computing, August 1999, Vol.7, Issue 8)

\(^3\) http://go.worldbank.org/M1JHE0Z280
convenience and safety to citizens’ lives, and consequently improving the quality of life (Fountain, 2001; Mulgan, 2000; Northrup & Thorson, 2003). While it was initially promoted as a means of improving internal management efficiency in public administration, e-government is increasingly considered an important measure for enhancing citizen access to government services and expediting the delivery of services to citizens (Morris & Moon, 2005; Streib & Navarro, 2006). E-government is used to enhance citizens’ access to government as much as government’s access to citizens using current network technologies. (Irani et al., 2006; Premkumar et al., 2006; Heeks and Bailur, 2007; Seifert and Chung, 2008)

The 7th annual measurement of the progress of online public service delivery across Europe report mentions 20 common basic public services, including the following

- Income taxes: declaration, notification of assessment
- Job search services by labor offices
- Social security benefits
- Personal documents: passport and driver’s license
- Car registration (new, used, imported cars)
- Application for building permission
- Declaration to the police (e.g. in case of theft)
- Public libraries (availability of catalogues, search tools)
- Certificates (birth and marriage): request and delivery
- Enrolment in higher education/university
- Announcement of moving (change of address)
- Health related services (interactive advice on the availability of services in different hospitals; appointments for hospitals)\(^4\)

Some of these services, like personal documents and certificates, are available to local people in developing countries like India using kiosks. (West Bengal Upgrading the State Machinery, CIO India)\(^5\)

According to the United Nations e-government program, e-government “encompasses the capacity and the willingness of the public sector to deploy ICT for improving knowledge and information in the service of the citizen. Capacity espouses financial, infrastructural, human capital, regulatory, administrative and systemic capability of the state. The willingness, on part of the government, to provide information and knowledge for the empowerment of the citizen is a testament to the government’s commitment.” (United Nations E-Government Readiness Knowledge Base (UNKB)\(^6\)) E-government is not simply a web-based or Internet government portal for citizens, nor is it simply ICT infrastructure or resources such as Enterprise Resource Planning (ERP), mobile networks, and Business Intelligence (BI). It is really about the relationship between the government and citizens, and how ICTs can enable that relationship. Over the past three decades, some countries, particularly developed countries, have gone through some transitions using ICTs along with the new understanding of the role of ICTs. By and large, however, e-government is still new to many governments, and more a concept than than a practice.

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3. Role of ICT in Government

The role of ICTs has dramatically changed over the past decade. Even in the private sector, until the mid-1990s, ICTs were commonly considered as corporate expenses with limited return on investments (ROIs). For example, the common notion was that any data center built by a corporation would quickly depreciate in value, as servers would quickly have to be upgraded or replaced. Governments had more passive approaches to adopting ICTs, often lagging behind the private sector. There was also typically lack of a legislative framework for e-government, largely due to ignorance or unwillingness to adopt transparency and accountability. Many global organizations, including the United Nations, define e-government in transitional terms as stages or phases.⁷ This implies that e-government is an evolutionary progress. However, as we have seen in the private sector, with new ICTs, it is not always necessary to go through the same stages that others have gone through. For example, even as it is too costly for some regions to install traditional telephone networks, wireless telephone networks are often easier to install and less expensive, while helping to promote new businesses. The explosion of mobile phones in Africa is a good example where “the penetration of the mobile phone is far greater than that of the Internet, especially in rural areas, making it the most accessible communication tool, according to Jon Gossier, founder and president of Appfrica, a technology company with headquarters in Uganda.” (In Rural Africa, A Fertile Market

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Integrating newfound and local uses of ICTs, for example, mobile phones in TB clinics in South Africa and the incorporation of mobile currency (i.e., M-PESA in Kenya) in parts of Africa into e-government can be challenging, as different rules govern the market or community. Yet these challenges are accompanied by opportunities for government to enhance services to promote the local economy (i.e., microbanking). “Stephen Yeo, chief executive of the Centre for Economic Policy Research, said mobile phones had enabled developing countries to "leapfrog" old technologies.”

This idea of leapfrogging old technologies and using readily available technologies (or COTS – commercial, off-the-shelf) is very important to consider in e-government. Sometimes, they can offer a less expensive but effective solution. For example, many corporations are considering cloud computing (i.e., software as a service) which may offer a cost-effective option for their enterprise.

With the emergency of the IT-driven paradigm shift, mobile communication has become a part of everyday life. With strong demand for multi-channel service delivery, mobile technology leads naturally to an exploration of the potential utility and feasibility of m-government. In Canada, the government is processing a project called “Government of Canada Wireless Portal” to enable citizen access to government information using mobile devices. This service includes the contact information of members of Parliament, border wait time, economic indicators, passport services, and Canadian government news releases, etc. As another example, Sweden, as a leading country of mobile technology,

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9 http://news.bbc.co.uk/2/hi/business/4331863.stm
provides m-government services throughout the country. Services include SMS applications for city job postings, a mobile parking payment system, government inspector service, mobile healthcare providers, and a wireless map system called MapMate. (Ostberg, 2003). Since 2007, Seoul Metropolitan government has introduced Seoul702, a mobile portal service through which citizens can suggest ideas and opinions about city policies.

Local e-governments provide citizens with opportunities to understand policy issues, facilitating active discussions and activating participation in public administration. By inviting citizens to voice their opinions on policy issues and ultimately have these opinions reflected in the city’s policymaking process, e-government can contribute to producing better policies for citizens. Services for citizen customers are based on satisfying the diverse demands of individual citizens and incorporating citizens’ opinions, imaginations, and creativity into e-government operation. Also, this service provides people with the most convenient public services by enabling them to gain access to the services whenever and wherever they want.

In the case of the Seoul Metropolitan Government (SMG), under the vision and slogan of “Ubiquitous Seoul, World Class e-Government,” SMG is trying to make the best use of ICTs and ubiquitous technology, and developing a variety of citizen-driven ICT services. Jung-hee Song, assistant Mayor for IT, is working on the front line to tackle these challenging tasks. Since 2006, the “Seoul Oasis” site is one of the successful services that have originated from the combination of citizens’ imagination, creativity and digital technology. Any citizen can freely make a suggestion on the site. And if an idea attracts people’s attention, the proposer, citizen customers, and experts get together to discuss
and review the idea, and adopt it as a city policy if it is approved. In addition to making suggestions, citizens themselves are able to participate directly in the process of transforming their ideas into city policies.

In China too, the government is trying to enhance local government performances. Shanghai has one of China's leading local e-governments, with a wide range of e-government initiatives including website portal, e-procurement system, and a social security card system, etc. In this way, the Shanghai government has begun to provide e-government services, moving away from old static information services to dynamic interactive services with new technologies. The Shanghai government has developed a smart card system, in which citizens can access a variety of G2C services with a social security card. The Shanghai government expects that the administration of social security and citizen services will serve as a new stimulus to the municipality’s economy and strengthen China’s transformation. (Shi, 2007; Chen et al., 2009)

E-government can be transitional (gradual and evolutionary) or transformational (rapid and radical). Many developed countries like the U.S. fall in the transitional e-government mode. These are the early ICT adopters who have gone through a several generations of ICTs in government and made a significant investment and dedicated resources over time. During the pre e-government days, these were the leaders who used technologies to manage government databases. Some of them learned the value of ICTs from each iteration of ICT transition. In some cases, this learned knowledge is not useful as new disruptive technology completely changes the way things used to be. It can also keep a government that has invested too much in legacy systems from changing to a new, more efficient system early. In a cable interview Eric Ken Shinseki, the Secretary of US
Department of Veterans Affairs said that his department is still largely “driven by a paper-bound process.” (CNN American Morning," November 11, 2009) He pointed out that the lack of system integration among departments and agencies was the main problem.

The transformational mode is based on a national strategy to achieve an effective e-government through rapid reform in legislation, dedication of resources, and smart use of ICTs. Both developed (without a long history of ICTs in the government) and less-developed (resource enriched) countries can be transformational if these conditions are met. Estonia which ranked 13th in the UN's 2008 e-Government Readiness Index falls into the transformational mode, making remarkable progress since its independence in 1991. (Table 1. UN 2007 e-Government Readiness Index)

<table>
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In either transitional or transformational mode, there are three levels of e-government.

**Level 1: Government-centric e-government** – Government ICT represents a collection of disjointed massive data processing centers. Some characteristics include the following: uni-directional relationship with citizens where the government collects data from the citizens but no services are provided based on the data, or the government only selectively provides data to its citizens (i.e., informational web portal about public health); no national ICT strategy and governance; fractured ICT management; disconnected or broken business processes; disconnected, redundant and inefficient legacy systems; and no clear idea about the system inventory (Figure 1). It is prone to
corruption. There is no public-private partnership. Some negative aspects include the following.

- Overall the system is too expensive.
- Too many local homegrown and legacy systems.
- Too expensive to upgrade or maintain over time.
- Too many incompatible legacy systems to deal with.
- No real data security or privacy measures.
- Potential misuse of data.
- No transparency.
- No accountability.
- No business intelligence to support decision making.
- No tangible economic benefit from the ICT.

Figure 1. Level 1, the Role of ICT in Government
Level 2: Semi citizen-centric e-Government – Government ICT represents a collection of massive organized systems working in some coherent manner to provide some intelligence. Some characteristics include the following: some degree of national ICT strategy, e-governance, and centralized management, somewhat reliable, accessible, transparent, and efficient, some degree of connection between levels of governments (i.e., federal and local governments) and inter-agencies, ICT is considered an enabler, ICT in most cases is still disconnected and redundant, it is somewhat bi-directional in terms of the government’s relationship to its citizens, and it is more citizen centric (Velsen et al., 2009) (Figure 2). Overall it is about cost-effective delivery of services to citizens but still not fully connected or integrated. Today, many developed countries are taking advantage of new technologies like Web 2.0 tools (i.e., social networks, blogs, wikis, twitters) and cloud computing (i.e., software as a service). There is also recognition that ICTs can improve or enable the government and its relationship with citizens. As it happened with e-commerce when it emerged, e-government is still considered as a subset or subunit of governments but this distinction is slowly changing. It is about providing government services in cost-effective ways by integrating and improving business processes through ICT. In this environment, ICT can help facilitate transparencies and accountability by consolidating information and providing better intelligence about government processes and where the weaknesses or wastes are. There is a limit to what government can do and the private sector can play a vital role in building a win-win public-private partnership that could benefit both parties (i.e., building a high-speed broadband network) which
could stimulate private sector growth and bring more revenue to the government. Some negative aspects include the following.

- Some upfront cost or investment is higher as many new ICT projects require more investment in the beginning (i.e., ERP implementation).
- As new systems come into the government, there is higher demand for education and training.
- Hiring qualified personnel is challenging unless the government offers a competitive salary.
- Weak on data security and privacy (i.e., government employees can easily download sensitive data to an USB drive).
- Still much of the government system is disjointed and has duplicate systems with unknown amount of errors or inaccuracies.
- There is no clear understanding of what new applications will impact government businesses (i.e., Web 2.0. tools).
- There is no real ICT governance to mandate transparency and accountability. It is largely implied.
Figure 2. Level 2, the Role of ICT in Government, e-Government

Level 3 – Full citizen participatory e-government: Government ICT represents a fully integrated seamless e-system for all government functions (i.e., taxation, procurements, social services, health benefits, etc.) and it engages citizens to take an active role in the system (i.e., e-election and e-democracy). This participatory system cannot be realized unless it deals with contemporary issues including the following: security (cyber warfare), privacy, control, and most importantly trust. E-government is no longer distinguished from government as it is the one and same, made up of massive business intelligence processing centers and fully integrated, connected, consolidated, multidirectional, and efficient on-demand systems. It offers greater public-private partnerships as the government is open to continually improving its business processes to provide better services to citizens by reducing waste and increasing service performance. It could stimulate economic growth as it could empower entrepreneurs by providing tools that they need, instead of setting up obstacles. It also promotes accountability and
transparencies within the government. At this level e-government is a fully sustainable model that can have a lasting impact on the country’s resources and it can better manage its environment (air and water quality, carbon footprint, forest, transportation, etc.).

Some negative aspects include the following.

- Too much concentration of power within the government.
- Higher security and privacy risk.
- Delicate balance of personal freedom and the power of the state.

Figure 3. Level 3, e-Government and Beyond

Public-Private Partnership (PPP) could be a part of e-government success as governments cannot do everything (health, education, information access, etc.) due to the lack of resource or knowledge. The goal of PPP is not pure profit gain, so it is different from the typical vendor. PPP is about community interest (i.e., health, education, infrastructure) that could potentially benefit the government and private sector partner which involves all stakeholders working in concert (Figure 3). For example, creating a nationwide high-
speed broadband could benefit everyone. Citizens will have faster access, government will pay less for the network, private sector partners will be able to create services to make profit over time. PPP is new to many governments and having the right balance of profit sharing among these players is a major challenge. How to create a win-win ecosystem for all partners while stamping out corruption is very difficult even in governments with legal frameworks to deal with such issues. In order to have a transparent and accountable PPP, there must be an oversight body that includes citizen organizations to ensure there is no conflict of interest.

Figure 3. Global PPP

4. Conclusion

All three levels or stages can be found in a transitional mode. Ultimately, government should strive for level three as it is the only sustainable level. In recent months, as many governments have experienced the impact of the latest global oil and gas crisis, they have set new national energy strategies, looking at alternative sources and technologies. There is a very close relationship with e-government and its sustainable future. If
government can manage its resources better by understanding the needs and making decisions based on intelligent analysis, it can create a sustainable environment for citizens. In level one, it is not sustainable as it is not looking at the long-term plan for the country and its citizens. In level two, it is still not sustainable as the government has no clear strategy for future sustainability and its interest lies with current social, economic, and political demand. For example, all governments should mandate a paperless business approach and adopt an e-document system. This type of mandate has a major impact on all levels of society especially the private sector. In the long run, it is a sustainable approach to the system. Given how ICTs have changed the world in a short time period, achievement of level three is just a matter of time. The ever-fast changing ICT world, technologies like Web 2.0, which made the digital world more participatory, and the current Millennia generation expects to play an active role in all aspects of society.

Figure 4. Three levels in e-government and requirements
In order to achieve the level three e-governments, government must consider the following (figure 4):

- It should have a clear national strategy or roadmap on sustainable e-government. This strategy should be clearly mapped to the resources and environment. The national strategy should be based on 1) a census that can provide clear demographic information such as ethnicity, income, gender, age, language, household size, etc., a top-down government review of services and functions, and a budget allocation, 2) after collecting the basic information aforementioned, it should do a SWOT (Strength, Weakness, Opportunities, and Threats) analysis. There should be multi-level SWOT analysis (i.e., top to bottom inter and intra governmental review, local government need assessment, national commission, citizens groups, etc.) and a consolidation of analysis and set goals and objectives; This process should include local governments as many citizens are more familiar with their community and local needs (Figure 5); This is particularly important for MDGs; A key to achieving many MDGs depends on how well the national strategy is directly mapped to the local communities where the real needs are and bring necessary resources to address problems like extreme poverty, poor health care, lack of education, etc., 3) at the same time, develop a national sustainability strategy and map the e-government strategy to its goals.

- It must have a legal framework to support the e-government initiatives.

- It should dedicate sufficient budget to support the e-government initiatives.
- It should mandate all government units to have goals and objectives for e-government.
- It should create educational and training programs for current and future government employees. It should also find ways to recruit and retain knowledge workers and leaders.
- There should be a presidential-level commission to integrate all government branches and units. This commission should include citizen organizations and the private sector.
- It must be open to citizen participation. This should be the core of e-government.
- Create a mechanism to promote public-private partnerships to ensure that the e-government initiative promotes economic growth (i.e., jobs, new businesses and technologies).
- There should be transparent assessment and evaluation throughout the system (i.e., procurements, grants, budget spending, etc.).

A sustainable e-government knows what the citizens need, based on citizen participation and properly distributing its resources while managing and creating sustainable resources.
Figure 5. Connecting the national government e-government to the local entities.

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