

## **E-GOVERNMENT AND THE APPLICATIONS OF TECHNOLOGY TO GOVERNMENT SERVICES**

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### **INTRODUCTION**

The following will examine the adoption of E-Government in Asia-Pacific in recent years. E-Government is the use of information and communication technology (ICT) to enable more efficient, cost-effective, and participatory government, facilitate more convenient government services, allow greater public access to information, and make government more accountable to citizens. These practices reinforce other reforms that are helping countries to better compete in the regional and global economy by strengthening markets and individual choice that in turn promote economic growth and poverty reduction.

Weighing against these benefits are the challenges of adopting and enforcing appropriate laws, regulations, and organizational changes, and of financing infrastructure, systems, technical support, and training, while ensuring equitable access and affordability. There are also risks to information security and privacy, and the issues and tradeoffs of internet governance, and open systems. The latter risks, issues and tradeoffs aren't addressed here, but are covered elsewhere<sup>2</sup>.

### **FACTORS DRIVING ADOPTION**

Asia-Pacific countries are widely dispersed on surveys of ICT penetration, including utilization and cost of bandwidth, and use of computers, telephones, and

television. For example Republic of Korea is ranked number one in the world in broadband use, with Hong Kong, China, Taipei, China and Japan also in the top seven. And yet, other countries in the region are among the least served in the world, with Lao People's Democratic Republic having only 0.2 bits per inhabitant (bpi) of international bandwidth, and Bangladesh only 0.4 bpi. This compares with around 15 bpi in Iran, and over 2700 bpi in Hong Kong, China. This wide dispersion is in part determined by the cost of access relative to income. Basic monthly Internet access costs range from around US\$6 in Iran to \$91 in Solomon Islands. In relative terms, Internet access costs range from 0.2% of average annual income in Singapore, to nearly two and one half times in Cambodia<sup>3</sup>.

In many countries, mobile phones are becoming a key information channel, and here again, the experience is diverse. Philippines, for example, had 27 mobile subscribers per hundred population (php) in 2003, compared to 1 php in 1995. Indonesia, a comparator country in other respects, had only 9 php in 2003. It is estimated that if this gap in mobile penetration were to continue, the result of this factor alone would be a one per cent higher long term growth rate for Philippines<sup>4</sup>.

Differential access to ICT is mirrored by wide dispersion in e-government. A recent, global e-government-readiness survey by the United Nations gave high marks to Republic of Korea (5 out of 178 UN member states having a web presence), Singapore (8) and New Zealand (13). Philippines (47) scored better than Indonesia (85), and many other regional countries had lower marks, including the five lowest, all Pacific Island countries<sup>5</sup>.

Countries adopt e-government both to move toward regional and global good practices, and to reinforce traditional processes. E-government fortifies “good governance” practices such as managerialism, accountability, transparency and freedom of information, rule of law, and combating corruption. These may be stimulated by commitments under international agreements, and by competitive pressures. Dutton<sup>6</sup> argues that e-government modernizes business processes by enabling more accurate, 24/7 responses to citizen requests, and linking transaction accounts in different agencies. This reduces costs, and allows harvesting of data from different systems, thus increasing the quality of feedback to managers and policy makers. Heeks gives examples across varying jurisdictions and bureaucratic cultures of similar, managerial reforms supported by information and communication technology (ICT), including improved effectiveness and efficiency of personnel management, parts procurement, accounting, health care, and claiming unemployment benefits<sup>7</sup>. Kaboolian<sup>8</sup> and Silcock<sup>9</sup> describe such managerial improvements linked to ICT as part of a global convergence to a standard reform model. Some theories of organizational change would also seem to apply across regions: for example, the importance of issue networks evolving to winning coalitions for successful ICT adoption<sup>10</sup>.

In other respects, countries adopt e-government in ways that reinforce traditional bureaucratic structures, cultures and links from administration to citizens and politics, in some cases making these traditional forms more responsive. On the positive side, Holliday<sup>11</sup> points out that networks of trust and cooperation in societies with Confucian backgrounds could provide favorable, institutional underpinnings for network-based ICT-enabled reforms. A survey<sup>12</sup> from the Republic of Korea shows that citizens expressing concerns to public officials online are less restrained by traditional notions of deference to authority figures than in face-to-

face interaction, and are more willing to challenge them. ICT is also enabling the archiving of “social and cultural memory”, and providing affordable channels for indigenous groups to distribute cultural artifacts<sup>13</sup>. On the other hand, Salazar<sup>14</sup>, Ranerup<sup>15</sup>, Benjamin<sup>16</sup> and West<sup>17</sup> point out that expected benefits are often blocked by traditional bureaucratic forms, technical difficulties, and insufficient attention to the information needs of communities. For example, ICT systems can only fully deliver on their promise if different offices and people are willing to share information, which is often not the case<sup>18</sup>. Likewise, introducing ICT may have little influence deep-rooted bureaucratic traditions. Japanese local government administrations, for example, have much smaller workforces relative to population than in western, developed countries, while having more extensive responsibilities and larger budgets. The reasons have to do with historical factors such as social structure, and traditions of voluntarism and contracting out, and not to managerial factors such as a desire for greater workforce efficiency or more extensive use of ICT<sup>19</sup>.

E-government hasn't yet been a key factor in increasing political freedom and democratic institutions, although it gives citizens new opportunities to express their views. There have been dramatic examples of ICT enabling mass political action that helped topple regimes in Thailand (1992), Indonesia (1998) and Philippines (2000). There are also examples in this chapter from non-democratic countries on how ICT is being used to improve government efficiency and effectiveness, and to better inform and seek feedback from citizens. Indeed, ICT-enabled managerial reforms in Hong Kong in the 1990s were motivated, in part, by a desire of the colonial administration to implant an effective bureaucracy to counter anti-democratic practices in the soon-to-be Special Administrative Region of Hong Kong<sup>20</sup>. Yet this doesn't mean that ICT-enabled managerialism will be a key enabler for political democracy. Democracy will come to countries as a result of many forces, only one of which may be ICT<sup>21</sup>.

## **RECENT INNOVATIONS**

Indicative e-government innovations will now be examined to help understand why each was adopted, what's worked, and what hasn't. Although attribution of results is difficult to prove, there is at least anecdotal evidence of positive results from e-government. In many such cases, while limited benefits were achieved, major improvements will require progress on other fronts. Another type of case will be examined where even limited benefits were not achieved, and significant resources were wasted. E-government practices tend to reflect existing structures and ongoing reform processes in each country in terms of quality of administration, citizen participation and extent of corruption. As in developed countries, e-government has not been a primary driver for administrative reform, although it has helped support reform processes. With this caveat, the cases will be presented under five categories according to intended results: citizen participation, efficiency, effectiveness, service integration, and combating corruption. Some cases achieve results under two or more categories.

### **Citizen Participation**

There are many cases where ICT systems help enable the civic conversation necessary to political democracy. For example, the Philippines Center for Investigative Journalism posted in 2003 on its website a study pointing out extravagant houses and luxury vehicles owned by government officials who can't explain how they paid for them. There were also numerous applications by officials to change their birth records to delay their retirement, indicating how lucrative their modestly paid positions must be<sup>22</sup>.

Partly as a result, the Bureau of Internal Revenue (BIR) began investigating over 100 of its employees for various offenses, and the Office of the Ombudsman filed charges against BIR employees, with assistance from a former senior official of the Hong Kong Independent Commission against Corruption. Although this effort may succeed, it won't be enough to bring about systemic changes without reforms on other fronts<sup>23</sup>.

In another example showing the limits of ICT-enabled citizen pressure on government, Indian journalists of Tehelka.com in March 2001 carried out a sting investigation on corruption in the Indian defense and political establishment, where officials were recorded taking bribes on videotape. This led to the resignations of top army and government officials, among them the defense minister, George Fernandes and the president of the ruling BJP, Bangaru Laxman. During that month, the site clocked over 25,000,000 page views; at other times it averages at 15,000,000 page views a month. The Government response was not been to indict any of officials shown to be corrupt in videos, but to target Tehelka with a Commission of Enquiry, tax investigations, and other harassment. However, Tehelka is still in business, and relaunched in 2004 as a weekly print and online newspaper<sup>24</sup>.

A much-discussed challenge is the “digital divide”: that poor countries, and poor citizens within countries, aren't benefiting enough from e-government and related reforms. This is confirmed by most conventional measures<sup>25</sup>, prompting the United Nations to call for “universal, accessible, equitable and affordable ICT infrastructure and services”<sup>26</sup>. Although this goal is ambitious, there is some progress being made. In Dhar district of the Indian state of Madhya Pradesh, citizens can get basic information and assistance through an Intranet kiosk linked to the district headquarters on a range of

issues such as, for example, broken handpumps, prevailing agriculture produce auction centre rates, and copies of land records. Village committees contract management of the kiosks to local businesspersons, who receive income through fees for services, including obtaining and filing official forms, classified advertisements, and searching through a database for the right match for a prospective bride/groom. However, the full potential of this system hasn't yet been realized because of challenges such as unreliable power and connectivity, manual backend processes in government agencies, and insufficient revenue to cover the costs of kiosks<sup>27</sup>.

There are many innovative approaches to increase Internet access to poor citizens. "Radio browsing" is used in Sri Lanka and Philippines, where listeners call or write in their questions, and answers obtained online are broadcast in local languages<sup>28</sup>. The People First Network in Solomon Islands links 18 solar-powered computers in rural areas by short wave radios with a server connected to an Internet link in the capital city<sup>29</sup>.

Remote Cambodian villages are linked to the Internet via a Wi-Fi access point mounted to motorbikes that exchange e-mail messages. When villagers have problems, they ask their local teachers that have computers to send emails to the governor, who promises to respond to these messages. A provincial hospital uses the system for referrals to a hospital in Boston, with digital cameras used for long-distance diagnosis<sup>30</sup>.

A different form of web-enabled citizen participation helps to better link expatriate specialists with their originating countries. Web-based associations promote the exchange of skills and knowledge, and some have made important contributions to poverty reduction work in their home countries<sup>31</sup>. For example, a diaspora site of the Republic of Marshall Islands run by a private, Marshallese individual in Arkansas,

www.yokwe.net , has extensive, up-to-date job listings in the public and private sectors, official documents, news articles and online discussions in Marshallese and English. This provides a useful supplement to the official government site, containing mainly basic, descriptive information<sup>32</sup>.

One challenge facing many countries is that English is the lingua franca of ICT; there are an estimated 2200 languages used in Asia, and only 20% of Asians can use English. Making e-government widely accessible to citizens requires addressing this challenge. Asian writing systems are varied and far more complex than English, and designing digital fonts for any one of them a massive challenge. Yet progress is being made. For example, the Urdu language with 60 million speakers in 20 countries uses a character based, bidirectional, diagonal, non-monotonic, cursive, context sensitive writing system with a significant number of marks (dots and other diacritics). In 2003, after 18 months of work by a 5 person team funded by donor agencies, a character-based font was released that can allow Urdu speakers to use their language in computer applications<sup>33</sup>.

## **Efficiency**

E-government innovations often promise cost savings and/or increased tax revenue, and there is evidence in the region that this is being achieved in some cases. In Gujarat State, India in 1998-9, pre-paid cards, electronic weighbridges, video cameras and computers were installed at 10 check posts on the state border to improve assessment of road taxes and penalties for overloading of trucks crossing the border, and to reduce corruption. For an investment of Rupees 630 million, revenue after three years has

increased by Rupees 169 million per annum, even after subtracting increases from the presumptive 7 percent increase in traffic. The gains could be much greater if further reductions in corruption could be achieved. According to survey data, 36 percent of truck drivers still pay bribes in return for reduced official charges, and 11 per cent have to pay bribes on top of the official charges<sup>34</sup>.

Efficiency gains can also accrue to citizens in terms of reduced waiting time and less money spent on bribes. The Department of Revenue in Karnataka State, India, has computerized 20 million records of land ownership of 6.7 million farmers, and makes them available at 168 kiosks throughout the state. The investment cost was Rs.185 million, not including software development that was provided at no cost to the state by the central government. Running costs are reportedly covered by a Rupees 15 processing fee paid by farmers. According to estimates based on survey data, this has resulted in a time savings by citizens seeking land records worth Rupees 66 million per annum, and savings in bribes not paid of Rupees 806 million per annum. The system is being expanded to include other information such as ration card holders, pensioners, wholesale market prices and weather information<sup>35</sup>.

Yet there are many other cases where planned efficiency gains are not realized at all. For example, the Bangladesh National Data Bank (NDB) project was planned to provide a broad range of data and information support to many levels of stakeholders both inside and outside the country. The NDB was to link twelve ministries and divisions with scope for further network connections to the planning cells of all other ministries/divisions. Planning began in 1992, with key investments beginning in 1999 of US\$440,000 for the first two years alone. However, the LAN was soon non-operational,

no database set up, nor any data storage. The project failed due to lack of technically competent staff at all levels in government agencies, coupled with a politicized procurement process<sup>36</sup>.

Procurement difficulties also derailed an attempt to use automated counting machines in the May 2004 Philippine election. In 1997, former President Ramos signed a law which authorized the government to use an automated system beginning with the 1998 National and Local Elections and onwards. After a pilot implementation during the 1998 elections, Mega Pacific eSolutions Inc. -- a consortium of several local and foreign firms -- won in 2003 the \$24 million bid to automate the counting of votes for the May 2004 elections. However, an unsuccessful bidder asked the Supreme Court to look at the legality of the bidding, and the court ruled that the process was flawed, and the contract cancelled. As a result, manual elections and canvassing had to be used. As in the past, the process was reportedly prone to irregularities, and the release of final results was delayed for six weeks.

### **Effectiveness**

In addition to efficiency gains, ICT-enabled reforms have yielded other benefits, including faster and more accurate response. For example, in Central Asia a national epidemiology service introduced ICT systems for gathering, processing, storing and reporting disease and public health data. System components used software packages for registration and analysis of diseases and public health risks. These created a single common system for information on specific diseases and public health risks, with local, regional and national databases searchable in various ways based on common data.

This system has worked effectively since being introduced in 1997, with many benefits. For example, shortly after being introduced, the system uncovered a rise in diphtheria cases. By increasing coverage of the vaccination program and introducing revaccination coverage levels rose from an average 88% to 99% by 2000, and diphtheria case levels had returned to their historical norm. Although such responses were possible with the manual system, the new system helped cut the decision time, and reduced vaccination cost through better prioritization, planning and targeting<sup>37</sup>.

In a different type of example, the Beijing city government's website allows visitors to select from categories such as government services, laws and regulations, a news center, links to other government departments, and an email section. The latter asks citizens to "make suggestions about the capital's development, or criticize work you're dissatisfied with"; clicking on a link gets the user started on an email to the appropriate office. Alternatively, users can join an electronic forum to get answers to questions such as how to move ones' official residence to Beijing in order to work there. The response on the website listed specific regulations and procedures. Although this example shows effective use of ICT to increase government effectiveness and facilitate certain types of citizen participation, these systems have been closely regulated to prohibit use for mobilizing opposition to dominant elites.

Many forms of e-government have emerged in support of the implementation of the 1991 Local Government Code in the Philippines. For example, the Multi-purpose telecenter project is presently set up in 4 barangays (villages) in Mindinao, allowing citizens to access a low-cost phone and Internet connection, and helping to ensure coordination among the barangay governments. Another system was built on a series of

projects of government, private sector, and civil society. The Sharing Network is an e-government project funded by the government. It responds to Administrative Order 332 calling for all government agencies to connect on the Internet. The City of Naga site has a wider purpose: to inform citizens on budgets, bidding documents, legislation, and procedures. Since many citizens don't have access to the Internet, the city also provides a hard copy of the Naga City Citizen Charter that contains essential information that's also on the website on how to access city services<sup>38</sup>.

Research on a project with some similar features in the Pondicherry district of the Indian state of Tamil Nadu, shows that some poor villagers have benefited. Information received through rural telecenters is broadcast on loudspeakers, and written on public bulletin boards. As a result citizens have better information on crop prices, prevailing wages, training programs, agricultural and veterinary services, weather forecasts, a second-hand goods market and insurance schemes. There are also reported feelings of empowerment by women volunteers that staff the telecenters<sup>39</sup>. Of course not all citizens benefit, including the poorest and most vulnerable, and the financial prospect for replicating the model is in doubt when the equipment cost is 55 times the annual earnings for a poor family.

ICT can play an important role in coping with disasters. For example, in the recent Tsunami, fatality rates were reportedly lower in Indian villages which had ICT penetration. And yet, traditional sources of information are in some cases still the most effective. For example, on December 26, 2004, villagers noticed a curious bubbling and rising of the water in a temple well. Over one thousand villagers came up from the

lowlands to watch this, and were all safe when the giant Tsunami wave hit. No warning message came through the local telecenter<sup>40</sup>.

Medon evaluates 610 telecenters set up by Kerala state, India in terms of Sen's notion of enhancing human capabilities, and finds improved motivation of government staff, empowered women and other citizens, and a boost to entrepreneurship<sup>41</sup>. Yet, as in many other ICT case studies, the evaluation is built on anecdotal evidence of success, and provides little rigorous measurement of performance improvement and citizen empowerment attained, nor the value-for-money achieved by necessary expenditures.

### **Service Integration**

Jurisdictions such as Singapore, Malaysia and Hong Kong, China have comprehensive systems where a web-portal or smart card integrates information and services from various government agencies to help citizens and other stakeholders get seamless service without needing to know about the responsible government agency. Thus, users can obtain services across different geographic levels of government within the same functional area, and across different functions. As an example of the latter, a citizen can submit a change of address on her driving license, and the change is automatically registered with the health, elections, and tax departments, thus avoiding the need for multiple filings. Citizens can also use these portals to make payments and other transactions, obtain a checklist of things to bring when applying for services in-person, find answers to frequently asked questions and engage the services of relevant commercial enterprises.

E-government systems allow the ability to harvest more data from operational systems, thus increasing the quality of feedback to managers and policy makers. For example, since 2001 Rajshahi City, Bangladesh, has been registering births on line, linking to a database that can be shared with other public agencies. For example, the Department of Health uses the system to help ensure immunization of all children. The system works in Bengali, although it can also generate certificates and reports in English.

Before the system was set up, a simple query such as the number of girls registered took a long time to answer. The manual process was also subject to errors, duplications and inconsistencies. The new system has removed duplication and redundancy from birth/registration, automated searching, sorting, processing and reporting tasks, and saved time. A combined ID number and bar-coding system has reduced errors. A CD-ROM of the database provides for backup and also allows transfer and reuse of data outside the LAN system. Both registration and immunization rates have increased since the introduction of the system. The direct costs of system development were less than US\$20,000, and operational costs are around US\$200 per month. The ICT based system was funded with help from UNICEF<sup>42</sup>.

New systems also allow direct access to transaction or customer accounts held in different parts of government. For example, Ho Chi Minh City in Viet Nam has taken the lead in that country in working to simplify administrative procedures faced by businesses, as a way of promoting investment. A “one stop shop” for business license applications has been established, whereby businesses can apply once online, and thereby initiate action from all the concerned agencies. These ICT-enabled reforms have inspired simplification of administrative procedures in many other districts and communes

throughout the country through “one-stop, one-door” models. Citizens benefit by spending less time waiting and traveling, and having better information provided to them<sup>43</sup>.

### **Combating Corruption**

Many think that e-government can reduce opportunities for corruption. While this is sometimes the case, it can also have no effect at all, or may provide for new corruption opportunities.

First, enhancing e-government can reduce opportunities for corruption by helping to measure performance better, facilitate outsourcing and contestability of public functions, reduce transaction costs, enforce rules more strongly, reduce discretion and increase transparency. However, computerization may also provide new sources of corrupt incomes for ICT professionals. New systems may instill the fear of getting caught in some staff, and restrict their access to sensitive information. Yet the same systems may provide new opportunities to ICT-savvy staff. Depending on the integrity of ICT staff, corruption may increase or decrease. In addition, the myth of computer omnipotence may also mean that some managers fail to institute proper controls on computerized systems as they assume that ICT removes the opportunities for corruption. Such lack of controls may be evident to those in a position to take advantage of it.

Finally, although ICT advances, like other technological changes, can improve the productivity potential of government organizations, only the managers and staff of these organizations know the actual improvement in productivity. It is in the collective interest of managers that their superiors underestimate the productive potential of these advances

in such cases, as organizations may then receive more resources than they need, which can then be used to increase the income or leisure of management or staff. This form of padding, if not corruption, was widely practiced in the centrally planned economies<sup>44</sup>.

Corruption is rooted in the cultural, political and economic circumstances of those involved. ICT does little to affect these root causes. It has a potential role, but a limited one that forms only part of a much larger picture. At the national level, one needs political will, public education, ethical watchdog agencies, appropriate incentives for honest officials and effective punishment for the corrupt ones. At the agency level, combating corruption is most effective when ethical values are part of the core business of an organization, supporting other factors like leadership and customer service to maximize stakeholder interests<sup>45</sup>.

With these caveats, there are some promising, anecdotal cases. For example, in Seoul, Republic of Korea, the OPEN system helps to get transparency in city administration by preventing delays in processing of licenses and other government documents. Prior to the introduction of the system, applicants often had to pay speed money; now processing is a matter of public record, on the web. If officials are unnecessarily delaying documents, citizens can complain and disciplinary action is taken<sup>46</sup>.

In another type of example, the Hyderabad (India) Metropolitan Water Supply & Sewerage Board uses its Single Window Cell (SWC) to reduce corruption for new connections. Previously, applications were made to one of 120 section offices, and then forwarded to 14 other staff before approval, each requiring “speed payments”. Under the SWC, the application process is centralized in one, public place, with applications

recorded on computers that are difficult for corrupt officials to alter. Staff is motivated to provide good service with distinctive uniforms, modern offices and individual computer terminals. The service improvement has been praised extensively in the media, which further improves staff motivation<sup>47</sup>.

## **LEGAL, REGULATORY AND ORGANIZATIONAL FRAMEWORKS**

Given the exceptional diversity of ICT penetration and other factors in Asia-Pacific, each country needs to develop a framework for promoting e-government appropriate to their needs. Each country needs to consider elements of a framework such as leadership, regulation, financing, human resources, organizations, and political acceptability. For successful e-government, countries need to adopt the right policies and practices for their needs, with policy coherence among the different areas, and supporting skills and organizations.

### **Leadership**

Barzelay<sup>48</sup> points out that heads of state and other top officials have a crucial role in putting reforms on the policy agenda, and in determining how important reforms are relative to other priorities, with the decisive factors being maximizing political advantage, and minimizing political risk. For many leaders, the politically opportune time for launching reforms is shortly after forming a government. This principle is true for e-government initiatives as well. Other, related success factors observed in e-government initiatives in the region include a capable, sufficiently funded office to oversee implementation, a data collection system to monitor progress and assess impact, benchmarks that are reviewed

regularly to ensure relevance for changing needs and technologies, and common IT standards.

Consider the story of Viet Nam beginning at least as far back as 1993, when a National Information Technology Program was initiated and followed through up to 1999. A government information network was implemented, with considerable application development, training and awareness raising. Next, the Prime Minister approved a Public Administration Reform (PAR) Master Program through 2010 with 7 action programs, one on modernizing state administration with a major role for e-government. Next, the Government made a landmark policy decision in September 2001 for State Administrative Management Computerization (SAMCom), which was a far more comprehensive strategy than the earlier 1993 program. Based on this, the Prime Minister requested ADB support through a \$45 million policy loan for support to action program 4 (training) and program 7 (state modernization)<sup>49</sup>.

Progress has continued to the present since the high level leadership commitment was clear, and there was considerable progress at the strategic level to build on, not just some pilot projects. About 120 executive information units have been set up in central and local agencies, and technical system platforms and training standards have been agreed for SAMCom projects. The Prime Minister's support has been crucial for keeping momentum on this flagship initiative, while the support of international partners has helped put in place necessary management support structures.

## **Policy, Legislation and Regulation**

Countries need to consider a number of other issues to increase ICT access and to ensure success with e-government, including an integrated policy approach, and an appropriate level of regulation to ensure affordable ICT access and an attractive environment for private investment in the sector.

A key lesson suggested by the Vietnam example above is the value of an integrated policy approach across government agencies. A lead ICT agency can play a useful role in achieving this<sup>50</sup>. For example, the e-Sri Lanka program has four objectives: increasing government effectiveness, empowering rural and disadvantaged groups, developing ICT leadership and skills; and creating ICT employment. The lead agency is the ICT Agency of Sri Lanka, set up under the Information and Communication Technology Act No. 27 of 2003. Working groups are preparing laws on e-transactions, including a scrip less securities settlement system for electronic transactions of Treasury bills and bonds, a review of evidence laws to set guidelines on the use of electronic evidence, procedures on data protection, and regulations on privacy, electronic security, and spamming. A new intellectual property act became effective in 2003, complying with the TRIPS Agreement<sup>51</sup>.

To best promote ICT access, countries need to set an appropriate level of regulation. While all countries need to regulate the ICT sector in some manner, the best regulators do so in the least costly and burdensome way. A good reference point for countries to consider is the Agreement on Trade in Services (GATS), which 26 Asian-Pacific countries have signed as part of their membership in the WTO. The GATS advocates that regulations conform to four fundamentals: non-discrimination, reasonable regulation, competition safeguards, and transparency. In areas such as regulation of e-

commerce, cross-border inter-operability is another desirable goal that has proved elusive to date in the region<sup>52</sup>.

A key determinant of e-government success is the level of competition achieved in telecommunications. ITU reports on levels of competition in 12 Asia-Pacific countries based on seven categories<sup>53</sup>. Philippines, Republic of Korea, and Hong Kong, China have fully competitive markets, including full privatization of the main fixed-line operator. Japan, Singapore, Australia and New Zealand are fully competitive in six out of seven, Taipei, China in five out of seven, and India, Indonesia and Macao, in three out of seven. Progress towards competitive markets is typically fostered by a competent ICT regulator to some degree independent from the operators they regulate, and from government policymakers. Some regulators get financing independent from the government budget, and are able to recruit and retain competent staff. They benefit from rules protecting them from political interference and conflict of interest.

Although regulatory capture is always a risk, particularly in small, less-developed economies, some Asia-Pacific countries have built up effective regulators and highly-competitive ICT markets, thus lowering e-access costs and helping to get a critical mass of users. The Philippines, for example, made significant progress in liberalizing its economy in the early 1990s, resulting today in highly competitive providers of mobile cellular and Internet services, and a rapid growth in mobile penetration, as cited earlier. One outcome is that Philipinos send 150 million mobile text messages a day, the most of any country in the world. E-government services are increasingly being made available through both mobile cellular and Internet channels, and the Philippines is the second-ranked middle income country in the region in e-government based on a recent UN

survey<sup>54</sup>. On the other hand, fixed-line telephone service in Thailand is provided by a government monopoly, with productivity levels less than half levels in the USA in this sector, long-distance rates among the highest in the region, and related problems across the ICT sector<sup>55</sup>. Partly as a result, Thailand is ranked lower than Philippines in the UN e-government survey, although its per capita GDP is more than twice that of the Philippines.

### **Financing**

Adequate financing is another requirement for e-government, and there are many ways to achieve it, including support from official donors, private sector, central agencies, user agencies, NGOs, advertising and fee-based revenue. Starting with donor funds, about 50% of bilateral, official development assistance (ODA) worldwide for ICT infrastructure has been granted to Asia in recent years, with Japan by far the largest donor, accounting for between 30 – 68 per cent of the total between 1990 and 2000. A striking recent trend has been a decline in (ODA) worldwide, from a high of \$1.5 billion in 1992 to \$194 million in 2002, because of a trend in the 1990s away from government and towards private investment in and ownership of ICT infrastructure, and a shift in donor priorities towards social programs directly related to poverty reduction<sup>56</sup>.

There are other forms of donor assistance for ICT, including multilateral support to governments and the private sector. In 2003 global ICT commitments from the World Bank (\$417 million), European Bank for Reconstruction and Development (€151 million) and European Investment Bank (€63 million) went mainly to private sector investments<sup>57</sup>. ICT support by the Asian Development Bank has included a \$16.7 million loan and \$1.6

million equity investment in 1998 to a cell-phone provider, Grameen Phone Ltd., Bangladesh; a \$9.5 million loan to Maldives for improving ICT infrastructure and e-service provision in outer-islands, a \$45 million loan of to Viet Nam in 2003 supporting public sector reform, with an important focus on e-government, and a number of much smaller, grant-funded national and regional<sup>58</sup> projects to support a range of ICT infrastructure and services.

These ODA investments play an important catalytic role, providing pilots and institutional reforms that can be scaled up when proven successful<sup>59</sup>. Yet ODA finances only a small part of overall requirements, Annual telecommunications investment in the Asia-Pacific region is estimated to be close to \$36 billion for 2003<sup>60</sup>, and government spending on information technology just over \$10 billion<sup>61</sup>. The main funding is raised by telecommunications companies and governments themselves, with only a small portion financed by ODA. In the next few years, it is expected that Asia-Pacific countries will increasingly follow the example of other regions and set up electronic production networks, where, for example, information requests, license renewals, tax payments, and e-procurement are outsourced to public and private specialist organizations. For instance, the Hong Kong government web-portal is entirely financed and maintained by a private company, thereby reducing the cost and risk to the government<sup>62</sup>. Malaysia's e-Perolehan government procurement system is a build-operate-transfer scheme led by a private company, Commerce Dot Com Sdn Bhd<sup>63</sup>. Countries in the region may also want to consider the experience of the US government, where public and private partners share in the savings and revenue coming from privately-financed, ICT investments<sup>64</sup>. Governments are expected to expand their efforts, like the private sector, in creating ICT-

enabled partnerships with suppliers and customers, together with whom they can find ways to cut costs, improve quality, and share the benefits.

Yet adequate financing by itself is no guarantee for success. The absence of relevant ICT knowledge in many government agencies risks either costly mistakes or missed opportunities for dramatic service improvements. For example, an attempt to install a database management and processing system in the Thai revenue department, launched in 1992, failed to deliver due to poorly-specified objectives among other issues. The main software vendor defaulted on the contract, and an estimated \$56 million in public funds produced minimal benefit<sup>65</sup>.

### **Human Resources, Organizational Development, and Political Acceptability**

ICT mainly benefits citizens who are healthy and literate, as already suggested above through the case studies presented. At higher levels, ICT and e-government implementation is most effective when appropriate skills and HR systems are developed in government and user organizations to support it. Take the example of Viet Nam. Despite the long-term strategic approach and leadership commitment to e-government highlighted above, Viet Nam faces considerable challenges in raising skill levels of the labor force to make the strategy work. A recent survey rated Viet Nam's workforce second from the bottom of 12 leading Asian countries in terms of high-tech proficiency<sup>66</sup>. Prospects may improve because of the strong value placed on education by families, and government programs to train 50,000 ICT professionals at university level by 2010, and to rapidly expand Internet connections to schools and villages.

Organizational factors are also important to make effective use of ICT. In addition to the need for computer literacy and management support as discussed already, employee involvement in implementation is critical, along with an organizational culture fostering trust, experimentation, teamwork, information sharing and participation. Appropriate training is also important, but less so than the other, enabling organizational factors<sup>67</sup>. The hierarchical, command-and-control, collectivistic cultures in many governmental organizations in the region may help to explain the slower adaptation of ICT by governments in comparison to private businesses and non-governmental organizations<sup>68</sup>. Other factors slowing down adoption in the region's public sector include work habits such as the paper trail required for approval processing; concerns about security; confidentiality of information; and resistance to organizational change.

To understand how these factors can work together, consider a typical chain of events starting by purchasing an off-the-shelf software package for, say, a new accounting or document management system. Often the agency finds that the software does not support the way they currently do business. For example, the package may require inter- and intra-agency record sharing that is not presently happening. Current practice may call for a paper trail for approval processing, or paper form filing done over the counter, that the package won't support. Public officials may also have a lack of computer skills, not understanding, for example, that a computer firewall can serve much the same purpose as a padlock on a file cabinet.

At that point there are two things they can do: They can change the way they do business to accommodate the software, which may mean taking some risks, and shaking up important peoples' roles and responsibilities. Or they can change the software to fit the

way they do business, which will slow down the project, risk introducing dangerous bugs into the system and make upgrading the software to the vendor's next release difficult, because the customizations will need to be torn apart and rewritten to fit with the new version. Private companies are more likely to take the first route, while public organizations too often take the second. Choosing the second route may be appropriate in some cases, but risks delays, higher software costs, and possibly a decision to abandon a project after large expenditures of time and money<sup>69</sup>.

Another challenge for government ICT initiatives is to ensure political acceptability. The Indian state of Andhra Pradesh is a much publicized example of e-government-enabled reform, led until May 2004 by its two-term, visionary Chief Minister Naidu<sup>70</sup>. Chief Minister Naidu tried to be careful not to antagonize important groups with the reforms. In addition to innovative systems delivering services to rural areas, he worked out an agreement with public unions that no public official would be laid off due to ICT. However, the May 2004 election results demonstrated the political risks of reform, as the Chief Minister was soundly defeated in his bid for a third term. Rural voters weren't impressed by the Chief Minister's vision of an IT-enabled state, when during a severe drought large numbers of farmers were committing suicide in the face of inadequate irrigation and erratic electric power.

## **CONCLUSIONS**

The e-government experiences in Asia-Pacific have improved our understanding of what works and what doesn't, what practices are transferable, and under what conditions. However, rigorous evaluation of reforms is rare, with few scholarly works

measuring the performance improvement and citizen empowerment attained, nor the value-for-money achieved by necessary expenditures. Fully cognizant of the methodological challenges, greater investment is needed in more extensive research on how to achieve high performance by the public sector through e-government in Asia-Pacific. Such research would lead to better prescriptions, and a better return on the considerable investment in reform by governments and international agencies.

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<sup>1</sup> The views expressed in this paper are the author's own, and do not necessarily represent those of the Asian Development Bank.

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