Public administration has changed in the 21st century. Citizens have come to expect the same level of efficiency in e-services from their governments as what they experienced from the private sector, with the widespread diffusion of the Internet. As a result, a seismic shift from the traditional model of a bureaucratic administration, to an increasingly user-participative e-government structure has been adopted by developed (and increasingly, developing) countries. Singapore is consistently placed amongst the top three in global e-governments rankings, alongside many technologically-innovative countries such as Canada, Korea, and the United States of America. So how does a small country with only 4.5 million citizens achieve sustained performance in e-government advancement, and with limited resources?

This paper traces the 28-year e-Government journey of the Singapore government and the evolution of the strategic plans for ICT use in public organizations, its preceding circumstances and consequences of e-government strategic planning.
Rationale for e-Government

When Singapore attained political independence in 1965, the young nation had to grapple with resource limitations such as shortage of land. The top priority of the newly-formed government was to kick-start the economic engine, and to care for the well-being of its citizens and business community. The initial vision was to transform Singapore into an offshore manufacturing hub for multi-national corporations. With an investment-friendly environment, and through the entry of foreign companies, Singapore saw an influx of investment, talent and intellectual assets from foreign lands.

Since achieving political independence, the Singapore government’s direction and policies have made efficiency a key driver and a top-level objective. As the nation elevated its global status over time, the cost of labour force in Singapore rose, along with the price of land. Low-cost and labour-intensive manufacturing thus became unsustainable in Singapore. Then, automation was regarded as a solution, and the Singapore government promoted this shift in focus.

The public sector was chosen to demonstrate the advantages of automation in process workflows. Pro-automation government policies featured heavily in the first national information communications technology (ICT) plan, the National Computerisation Plan (NCP), which was launched in 1980 at the tune of S$100 million. The NCP focused on the deployment of newly-developed technologies for automation of transaction processing, data modelling and management to improve the service efficiency of public agencies. The other objective was to facilitate the development of the local IT industry, and develop a pool of IT manpower.

A first step towards this goal was to establish a central agency which would lead the strategic planning and implementation of widespread public sector computerisation in Singapore. Thus, the National Computer Board (NCB) was formed on 01 September 1981 to champion the government’s computerisation program. An important early decision was to ensure availability of IT human resource to implement the ambitious computerisation program, since the young nation had only an estimated 300 IT professionals in the early 80s.

During its first year, NCB led the formation of the Institute of Systems Science (ISS)—in collaboration with IBM—to grow Singapore’s ICT talent pool with the deployment of IT manpower conversion programs. Today, ISS is a full-fledged education institute, and as part of the National University of Singapore, offers post-graduate degrees and certified professional training focused on IT manpower development.

Singapore’s National Infocomm Plans

With a central coordinating agency in place and a qualified talent pool assured, Singapore embarked on its 27-year e-government journey and has since published four successive Government Infocomm blueprints for the years 1980 to 2007. (See Figure 1)

These are:
1) Civil Service Computerisation Plan (CSCP 1980-1999);  
2) e-Government Action Plan I (e-GAP I 2000-2003);  
3) e-Government Action Plan II (e-GAP II 2003-2006); and  
4) iGov2010.

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Prior to this, there had been provisional computer installations in various public ministries. For example, in 1963, the Central Provident Fund (CPF) Board became the first organisation in the Singapore public sector to install a computer, a IBM mainframe computer.

By 1980, Singapore had developed a fledgling infoomm industry with the entry of multi-national corporations such as the International Business Machines (IBM), Accenture (then Anderson Consulting), and Hewlett-Packard (HP). Infoomm technology (ICT) had also reached a cost-effective stage with the automation of workflow and administrative tasks due to the launch of Intel’s 8088 microprocessor, which was targeted at low-end systems. This was also supported by technological advancements such as the TCP/IP protocol and relational database management systems. The launch of the then-revolutionary IBM 5150 PC in 1981 further empowered the masses through widespread availability of office desktops.

National IT Plan (1986 - 1991)
The years 1985 and 1986 were marked by global economic recession, resulting in shifts in Singapore’s economic strategy. Policies were broadened to include services as a critical growth component. With a well-developed communications and logistics infrastructure, Singapore developed a regional. The growth, economic viability and diversity of small and medium enterprises (SMEs) was also a key objective of the broad strategic vision.

The Singapore government viewed SMEs as a growing source of employment, from being distributors to becoming self-sufficient knowledge enterprises.

The second national infoomm plan—the National Information Technology Plan (NITP) — was launched in 1986 to promote the local ICT industry. The mid-80s also witnessed dramatic changes in the IT industry with the emergence of open systems and software as applications, unbundled from the proprietary hardware systems. The adoption of open standards as the dominant design increased entrepreneurial opportunities in the IT industry with the creation of start-up firms. Core objectives of the NITP included improvements to the infoomm infrastructure, development of ICT professionals and encouraging entrepreneurship in the ICT industry, otherwise termed as ‘techno-preneurship’.

At the same time, there were readily available affordable desktop computing devices, with faster processors and bigger storage capabilities. By 1986, software such as Microsoft’s Word, Spreadsheet and Database were commonly used.

The Singapore government then moved to provide “One Stop—Non Stop” services. Public systems such as PeopleHub, TradeNet, PortNet, LawNet, MediNet and BizNet were commissioned during this period. The TradeNet and BizNet portals heightened the global competitiveness of Singapore SMEs by reducing business transactions costs, while increasing efficiency. Cost savings were estimated at US$1 billion per year. By mid-1991, an annual 3.1 million import and export declarations were processed.

The Singapore government was greatly encouraged by its initial successes in ICT implementation. Dr Tan Chin Nam, former chairman of the NCB (1987 – 1994), articulated the vision that “there will be no boundaries in the information age; Singaporeans will be able to see and talk to other people, even if they are separated by oceans, continents, time zones, geographical and political boundaries”. In 1992, the NCB co-operated with 11 groups from both private and public sectors to develop the third national infocomm plan, IT2000. A key objective of the IT2000 plan was the development of a National Information Infrastructure (NII) which had five strategic thrusts:

1) Develop a global information hub;
2) Promote the Singapore economy;
3) Enhance potential of citizens;
4) Link communities globally; and
5) Improve living standards in Singapore.

IT2000 detailed plans for enhancing individual potential to increase employment options, and encourage entrepreneurship by allowing greater information exchange via the communication network throughout the island. However, the Singapore government was also concerned with the social implications of ICT development, such as security and censorship issues. This was quickly overshadowed by the rapid adoption of the Internet by organizations and individual citizens in Singapore. Then the government realised that the future of ICT lies in the emerging Internet technologies; and a decision was made to establish a nationwide broadband network, abandoning the NII initiative.

Mr Lim Swee Say, former chairman of NCB (1994 – 1998), realised that “content had become multi-media; computers had to be multi-media [ready]; the network had to change; the [Singapore government] had to go broadband because the bottleneck was the network”. To solve this, Singapore installed a nationwide broadband network—the Singapore ONE—followed by the Government Resources on Internet (GRIN). Within three months, all ministries, statutory boards and organizations in the public sector had an online presence.

By 1998, Singapore had established an impressive portfolio for service innovation through high-profile initiatives that utilised many other forms of technology. Projects implemented during this period included:

- Electronic Road Pricing (ERP) system to manage traffic congestion;
- Use of RFID chips by libraries to shorten queues; and
- Electronic Medical Records (EMR) to retrieve and share medical information.

With convergence of ICT and telephony, Singapore formed the Infocomm Development Authority of Singapore (IDA), on 01 December 1999, by merging the National Computer Board (NCB) and Telecommunication Authority of Singapore (TAS). One of the IDA’s key roles was function as a national chief information officer (CIO) to the public service sector.


The dotcom era and its eventual downturn provided the motivation for the formulation of the fourth national infocomm plan. Infocomm 21 had the objective to “develop Singapore into a global infocomm capital, with a thriving and prosperous e-economy and an infocomm-savvy e-society”. Under this plan, four key strategies were formulated by the newly-minted IDA:

- Position Singapore as a premier APAC ICT hub;
- Empower the private, public and people sector through ICT;
- Develop Singapore as an ICT talent capital and a hub for e-learning; and
- Create a pro-business and pro-consumer environment.
The Singapore government launched the "Public Service for the 21st Century" (PS21) service excellence campaign, aimed at inculcating service excellence. The convergence of Infocomm 21 and PS21 led to the development of the first e-citizen portal (www.e-citizen.gov.sg) in the late 1990s. This e-citizen portal gave a preview for the e-Government Action Plan (eGAP I), the second government infocomm plan of Singapore.


In 2000, the better-educated population became increasingly vocal about the need for increased dialogue between the government and the people. The Internet was used as an efficient platform to reach and engage citizens. With this, eGAP I was launched. Its primary focus was to facilitate transactions between the government and its three key stakeholders groups: citizens, businesses, and employees.

Under eGAP I, the Electronic Services Program provided a one-stop interface for the government to interact with the citizens. This came with the integration of all relevant government services. Some saw the e-Citizen portal as perhaps the most important achievement of this period. Other initiatives such as the myCPF portal (www.cpf.gov.sg), which spotlighted the government’s intent in improving its service delivery, including reducing process times and counter visits for retirement fund transactions by all citizens.

Things took a dramatic turn in September 2001, however, with the terrorist attacks in the United States of America. In December 2001, 13 men were detained in Singapore for terrorist-related activities, and found to be members of an organization which was linked to terrorist group the Al-Qaeda. According to media reports, those detained were students in Singapore; and all but one had been Housing Development Block (HDB) dwellers. The Singapore government renewed efforts to promote inter-racial and inter-religious understanding, which included open discussions of threats posed by Islamic extremists. The Ministry of Community Development was tasked to identify the fault lines in policies and underwent many structural changes in 2004 as a solution. These reworked policies included into ICT opportunities, e.g. community Web sites such as the Youth.SG portal (www.youth.sg) were created with the aim of building greater society cohesiveness.

**e-GAP II (2003 – 2006)**

Even with the implementation of eGAP I, there was still a significant number of people who were “digitally excluded” i.e. those who couldn’t afford a computer or found this form of interface difficult. To counter this, the third government Infocomm plan called the e-GAP II was introduced in 2003—at the cost of US$900m—that “deliver[ed] more integrated services to meet the needs of our public and businesses... develop the tools and help us connect citizens with each other and the Government, and involve them in issues that they have expertise in, or issues that affect them”. With this, eGAP II was formulated with three targeted outcomes:

1) Delighted Customers,
2) Connected Citizens, and
3) Networked Government.

The launch of consultation portal REACH (www.feedback.gov.sg) was another landmark project. From 2003 to 2006, an estimated 50,000 public responses were received through the portal, during policy consultation exercises. To further consolidate services provided, SINGOV (www.gov.sg) was launched to integrate the services of the government, needs of the people (as e-citizens) and the business community (Enterprise One).
By the end of 2006, the eGAP II showed encouraging results. 85% of the e-government users were satisfied with the overall experience of the e-services; while nine out of 10 citizens—who had transactions with the government—chose to transact electronically. As a follow-up, the Singapore government then launched a US$1.38 billion five-year master plan—the iGov2010—with the aim to transform the Singapore government into an integrated government (iGov) that delights customers and connects citizens through infocomm.

Strategies were laid to install systems which would raise efficiency in the public sector, improve channels of service delivery and increase reach. With the fourth national infocomm plan, iGov2010 detailed a synergistic and integrative plan that exceeded the expectations of its citizens, with the following key objectives:
- Increase reach and quality of e-services;
- Increase mindshare in e-engagement;
- Enhance capacity and synergy; and
- Enhance competitive advantage.

Singapore’s e-Government success and the formation of the e-Government Leadership Centre
Now, with close to 30 years of successful e-government experience, Singapore is poised to further strengthen its leadership in e-government education.

IDA, with the ISS and the Lee Kuan Yew School of Public Policy (LKYSPP) formed the Singapore e-Government Leadership Centre (eGL) in 2006. The eGL Centre works to provide public sector e-Government leadership education, conduct research and provide thought leadership on the use of ICT for the development and implementation of public policies. In addition, the eGL Centre provides advisory services on e-Government, ICT governance and ICT management for the public and public-related services. The centre also organises sessions to share Singapore’s e-government journey with foreign government participants to assist in the development of other e-governments.

The Singapore government has shown foresight and prudence in resource allocation towards e-government initiatives. Agencies like the IDA are thus supported to utilise the right level of resources towards proper implementation of sustainable e-government plans. In 1991, it was estimated that for every dollar invested in the CSIP, return of investment was US$1.87 for every dollar spent! Sound strategic planning goals and processes, deep levels of commitment, and a strong supportive eco-system are also critical to the successes of e-government plans.

Focused education institutions such as the Institute of Systems Science and the Lee Kuan Yew School of Public Policy—both being members of the National University of Singapore—were formed to nurture a continuous IT talent pool. This helps to maintain an effective ecosystem for the execution of national infocomm master plans and policies.

The effectiveness of the strategic plans for ICT use in public organizations is largely determined by the fit between the underlying philosophy of governance and the level of ICTs, including the existence of a coordinating central agency, the availability of adequate funding, the comprehensibility and concreteness of the strategic ICT plans and the development of complementary resources and capabilities with a vibrant local IT industry. As the plans become increasingly effective at meeting the needs of citizens, e-government maturity and the depth and breadth of ICT use in public organizations correspondingly increase, which, in turn, will lead to greater service innovation in the public sector.

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