Singapore ONE: Universal Access to Broadband

Background

Singapore ONE is the result of a national effort to keep Singapore at the forefront of modern ICT exploitation. A city state with few natural resources, it relies on human resources for wealth creation. Three earlier plans that set the foundations for Singapore ONE were the Civil Service Computerisation Programme (1981), the National IT Plan (1986) and IT2000 (1992) which created the vision of a “wired island”. Singapore ONE was announced in June 1996 and launched (after pilots) in June 1998.

The commitment to early adoption of broadband was considered a “leap of faith”, with no obvious “compelling usage” and uncertainty as to the right technology and standards to adopt (e.g. for DSL and cable modems). At its inceptions there were some 20 technology providers and 100 participants (20 schools, the National Library, 10 Community Centres, 30 multinationals and 50 local companies). Today, over 300 providers supply a range of services, covering over 100 categories in four main groups - hosting, hardware vendors, content providers, services and support. Highly used services are information content and transactions through a range of portals (finance, employment, engineering, medical and health, shopping, travel, entertainment etc.). Typical usages are:

- Businesses - use of multimedia marketing
- Education - multimedia educational content into schools and home; also virtual laboratories e.g. experimentation with virtual CRTs (cathode ray tubes) rather than queuing to learn on the real thing
- Home - information access (e.g. to multimedia libraries), e-shopping, with some usage of videconferencing and the potential for video on demand.

There are related initiatives to support e-commerce adoption (e.g. The electronic commerce master plan 1998), multimedia technology development and IT education at all levels.

In 2001, Singapore has 60% PC and Internet penetration and over 300,000 broadband users. Besides having a pervasive national Information Infrastructure, they also have high-speed connectivity to more than 29 countries including China, US, Australia, Japan, India, Europe and all ASEAN countries.

Large Companies in all economic sectors have embraced at least some form of IT for their business operations. More than 95% of companies with at least 10 employers are already computerised.
In 1999, Singapore’s online business-to-business transactions totaled approximately $40 billion. The local IT industry has registered a posting of $23 billion in total revenue in 1999 – up from S$20 billion in 1998. Almost half of the total revenue was derived from exports.

Objectives

a. To expedite and deliver the benefits of broadband services to everyone, citizens and businesses alike;

b. To nurture a vibrant multimedia industry;

c. To position Singapore as the place for innovation and leadership in broadband exploitation.

The future focus (from early 2002) is:

a. To stimulate the development of innovative applications and services for the home and the community.

b. To accelerate the adoption of broadband for businesses.

c. To heighten consumer awareness and adoption of broadband services.

d. To grow the competitiveness of the broadband industry.

The Infocomm 21 Masterplan launched on 4 March 2000 emphasised the need for net-savvy workers (three quarters of the workforce by 2010). Its three core objectives are to create:

a. A dynamic and vibrant ICT sector

b. A competitive e-economy

c. A lively e-society.

Resources

Investment to support specific adoption programmes e.g. in 2000, a three year S$25 million targeted at “low income households, different ethnic groups and late adopters”. In 2002 S$30 million over two years to increase penetration and usage e.g. pilots and trials in “connecting the homes” and “connecting the community”. (Note: 1€ = 1.7 S$).

Activities

Singapore ONE was developed in three phases:
1) 1996-7: building of the infrastructure and key services; initial piloting and testing
2) 1998-2002: launch plus early adoption phase focussed on developing an Interactive Broadband Multimedia (IBBMM) industry and building the level of advanced applications and services
3) 2002 onwards: propelling Singapore towards mass adoption; three key initiatives are aimed at the work environment, home environment and learning environment.

From the outset a multi-agency approach was adopted with task teams from several government agencies working together. The initial roles were as follows:

- NCB (National Computer Board) – development of multimedia broadband applications and deployment of “information appliances”
- TAS (Telecomms Authority) – the backbone infrastructure
- NSTB (Science and Technology Board – R&D for technology development
- EDB (Economic Development Board) – promoting the economic benefits to local businesses and attracting investment from abroad
- SBA (Broadcasting Authority) – encouraging broadcasters and other content providers to develop content for broadband.

In 1999, the main driver of Singapore ONE today – the Infocomm Development Authority (IDA) – was created from the merger of the NCB and TAS. In April 2000, telecommunications services were liberalized, this helping to stimulate competition for broadband access.

Other key features of IT2000 programme were:

- Early emphasis on training – for engineers (to deploy the technology) and also education the consumer
- Heavy communications e.g. e-lifestyle and e-Celebrations 2002 to celebrate 5 years of broadband and demonstrate to applications to citizens at various locations
- Ongoing initiatives to promote uptake – the most recent (2002) looks at value chains to increase penetration in home, work and learning.
- Heavy involvement with different communities and groups – for example there are Malay and Tamil Internet Steering Committees, that act as focal groups for the development of local content, creating awareness and running events.
- Active development of alliances e.g. with content and technology providers such as iMBC (Korean broadcaster).
There have also been financial incentives (tax breaks) to encourage online usage by business.

Singapore also wants to be an e-inclusive society. Examples of its approach include:

a. public access points and innovative ways of access: as well as kiosks there are over 40 LAN hotspots across the island (shopping malls, community centres, cybercafes etc.).

b. helping those with less financial means to have access e.g. a project for disadvantaged children

c. making access more affordable for the average citizen e.g. through promotion of competition and early adoption of new technologies where appropriate.

Looking to the future, Singapore wants to establish itself as a broadband hub. It already has good broadband connections and close relationships with other Asian countries such as Japan and Korea.

**Output and Results**

The initial aim was to attract 400,000 broadband users by the end of 2001. Soon after launch in 1998, reached 10,000 users; then 107,000 by November 2000, 260,000 by mid 2001, 950,000 by April 2002 and 99% coverage of all premises. However, the ITU survey described the uptake in April 2001 as “surprisingly low” considering the near universal access.

Half users are home-based; half business; 92% access broadband at least two days a week. Most usage is for email and WWW. Usage survey showed that 53% of home users use it for news (e.g. via webcasts), 45% to download music, 33% to play games, watching movies online (15%). However, only 12% bought products and services online. (Nov 2001 survey).

More than 1,000 companies have incorporated broadband as part of their business operations. All 391 schools, tertiary institutions and public libraries in Singapore now have broadband access. More and more hotels, industrial complexes and commercial buildings are getting broad-band enabled as well.

There are significant shifts in user perceptions of what broadband can do.

There are over 300 companies providing multimedia broadband products and services.
Access prices have dropped to a fifth of what it was in late-1990s (there are now 12 competing access providers).

One study of working professionals (ref 6) indicated that the government was the most influential body, and identified six distinctive roles: a strategist, a builder, a regulator and facilitator, an investor, an integrator, an educator.

Output and Results – Key Factor: improved regional ICT infrastructure and services
The national information infrastructure, as manifested in Singapore ONE (One Network for Everyone) – the first nationwide broadband network in the world – has reached nearly 100% of households, all schools, most public libraries and community centres, and major commercial buildings. There are more than 200 broadband applications available on Singapore ONE, covering areas such as online learning, online shopping, online banking, e-government services, video-on-demand and music-on-demand. The number of broadband users has exceeded 300,000.

Today, Singapore is among the top few countries in the world in terms of PC and Internet penetrations – more than half of the households own PCs and subscribe to the Internet. In the schools, there is already one notebook computer to every two teachers and the target is to have one PC to every two students by 2002. Mobile cellular phone penetration, at more than 60% of the population, has exceeded fixed phone line penetration.

Output and Results – Key Factor: improved regional social and community services
Singapore ONE is working with the legal sector to facilitate the implementation of multi-party video conferencing over broadband between the Subordinate Courts, Supreme Court, Attorney-General Chambers and legal firms. This will eventually be extended to other organisations within the legal sector.

In the schools, IDA worked together with 42 schools and 18 education service providers, under the Fast Track@School programme to develop interactive and multimedia content. The objective was to leverage on broadband to enhance the teaching and learning experience. One of the schools, River Valley High, set up a “Virtual Physics Laboratory” where students can experiment with complex and expensive laboratory equipment such as the cathode ray oscilloscope (CRO). Schools usually have only 2 units and students had to queue to use it. With the virtual CRO online,
all the students are able to try out simultaneously as well as record and analyse the results immediately.

Output and Results - Key Factor: improved regional social capital
There are currently over 300 companies in the interactive multimedia industry from access provision, content creation to aggregation, hosting and delivery. Initial efforts have been made with the media industry where IDA is working together with the Singapore Film Commission to encourage the creation of digital films which will be screened both in the theatres and online.

Output and Results - Key Factor: improved regional inclusion
In June 2001, Prime Minister Mr Goh Chok Tong stated that it is important for Singapore to build an "e-inclusive society. By that, he means that technology should be made accessible and affordable to all, regardless of race, language, social background or ability. He also said that everyone should benefit from this Digital Revolution.

IDA will continue to enable access in 3 ways:

a. Firstly, ensuring that there is sufficient public access - and providing new and innovative ways of access.
b. Secondly, helping those with less financial means to have access.
c. And thirdly, making access more affordable for the massed, by continuing to promote a competitive telecoms environment and to leverage on new technologies where appropriate.

Today, public areas and libraries and most community centers have internet access. Singapore already has more than 40 Wireless LAN hotspots in cafes and shopping malls. We hope to have more of these hotspots all over the island. In addition, all the National Libraries have Broadband access so if you do not have internet or even broadband access, you can simply go to any public libraries to get it.

Secondly, in terms of helping those who cannot afford the access, over the past years, IDA has been managing the PC Re-Use Scheme with the support of 20 lead agencies like the Community Development Councils, Self Help Groups and Volunteer Work Organizations. The main objective of this scheme is to provide needy families with refurbished personal computers so that each one has the opportunities to learn IT skills. Each refurbished computer is bundled with 6 months of toll-free internet access. To date, 6200 needy families have benefited from this scheme and another 850 PCs have been deployed to help non-profit organizations set up IT Resource Centres.
Lessons and conclusions

Main results are:

1. Reaching wider segments of the society and penetrating homes and small businesses.
2. Encouraging SMEs (Small and Medium Size Enterprises) to promote their products and services online.
3. Encourage entrepreneurship by laying the infrastructure and facilitating adoption of e-commerce.
4. Provide training and retraining of the labour force by taking advantage of the broadband in delivering material using e-learning.
5. Linking communities within Singapore and abroad by creating virtual communities.
6. Provide public consultation, medical services and so on.
7. eGovernment and epayments which made possible by the broadband.

The creation of Singapore ONE is attributed to the “vision, passion and dedication of many individuals and organisations from both the public and private sector” (ref 2).

An early recognition was that such a development was beyond the capabilities of one government department. Therefore collaboration is fundamental - both across government agencies and between the public and private sector. There are inter-agency task teams and task forces to address specific areas e.g. market development, strategic alliances, international cooperation.

As collaborations evolve, new and enticing applications proliferate, which in turn help to fuel the regional demand for broadband.

High emphasis is given to education and awareness. Hence the involvement of the National Library and schools from the outset. Stimulating awareness and understanding at ground roots (within businesses and communities) is the focus of ongoing programmes, as adoption rates might have been expected to be higher.

The liberalization of telecoms was brought forward (from 2002 to 2000) and there is attention to the regulatory environment to make it pro-business and pro-consumer.

External commentators note that the single layer of government, and the high population within a relatively small area make implementation easier than elsewhere.
Build on the foundation that has been laid over the past 20 years in Singapore, a five-year strategic plan has been developed by IDA to set out broad directions and strategy for Infocomm in the new economy. This strategic plan, Infocomm21, consists of six main thrusts:

- Position Singapore as a premier infocomm hub in the Asia-Pacific;
- Develop a competitive e-economy, or e-Powering the Private Sector;
- Evolve the best e-government, or e-Powering the Public Sector;
- Nurture an infocomm-savvy e-society, or e-Powering the People Sector;
- Make Singapore an infocomm talent capital and a hub for e-learning;
- Create a conducive pro-business and pro-consumer policy and regulatory environment.

In implementing Infocomm 21, the Singapore government adopts a holistic and integrated approach to defining the various building blocks to ensure that all necessary inter-relationships among the components are considered. These building blocks include industry and enterprise development, technology development, market development, infrastructure development, manpower development, policy and regulation, thought leadership, education and awareness, strategic alliances and international cooperation. (ref.5)

Lessons and conclusions - Key Factor: improved regional ICT infrastructure and services

- About 1 in 3 (34% or 950,000) Singapore residents aged 10 years and above were broadband users.
- ‘Home’ (46% user incidences) and ‘Office/Workplaces’ (46%) were the most popular broadband access locations.
- ADSL (40% share) was the most popular broadband access mode.
- ‘E-mail’ (96% user) and ‘information retrieval & search’ (86%) were the most popular types of broadband applications / services. Gaining in popularity are ‘chat/ICQ’ (51%), ‘downloading music’ (45%), ‘web applications’ (43%), ‘playing online games’ (36%) and ‘watching movies’.
- 57% of the broadband users used broadband applications/services for 5 days or more in an average week while 71% of these users used them for a total of 10 hours or less per week.
- At least 85% of the broadband users were generally satisfied with their overall experience. Majority of these respondents was satisfied with the access speed, reliability of connection, range
of applications/services, broadband service providers’ help desk and subscription costs.

- Amongst the Internet users, the slight majority (71%) deemed that a price of “not exceeding $30” to be most reasonable for an unlimited usage of broadband applications/services.

References and links

2. Empowering people through Infocom Technology, speech by Mr Khoong Hock Yun, Infocom Development Authority, World Telecom Day (17 May 2002).

References and links - Key Factor: improved regional ICT infrastructure and services


References and links - Key Factor: improved regional inclusion
SPEECH BY MR KHOONG HOCK YUN, ASSISTANT CHIEF EXECUTIVE, INFOCOMM DEVELOPMENT AUTHORITY, MAY 2002. “Empowering people through Infocom Technology”

Further information

Sg_Lessons1.pdf - NATIONAL INFOCOMM STRATEGY AND POLICY: SINGAPORE’S EXPERIENCE by William Hioe, June 2001 Singapore
Sg_SurveyBroadbandUsage2001.pdf - SURVEY ON BROADBAND USAGE IN SINGAPORE 2001 - Summary Report - produced by Infocomm Development Authority of Singapore
Sg_unpan001458.pdf - “FROM INTELLIGENT ISLAND TO GLOBAL INFOCOMM CAPITAL”, KEYNOTE ADDRESS BY MR LAM CHUAN LEONG, CHAIRMAN, INFOCOMM DEVELOPMENT AUTHORITY OF SINGAPORE. 24 May 2001