iDA
INFOCOMM DEVELOPMENT AUTHORITY OF SINGAPORE

Infocomm Development Authority of Singapore (IDA) develops, promotes and regulates info-communications in Singapore, with the aim of establishing Singapore as a leading infocomm hub in Asia. To nurture an internationally competitive infocomm industry, IDA offers a comprehensive range of programmes and schemes for both local and international companies.
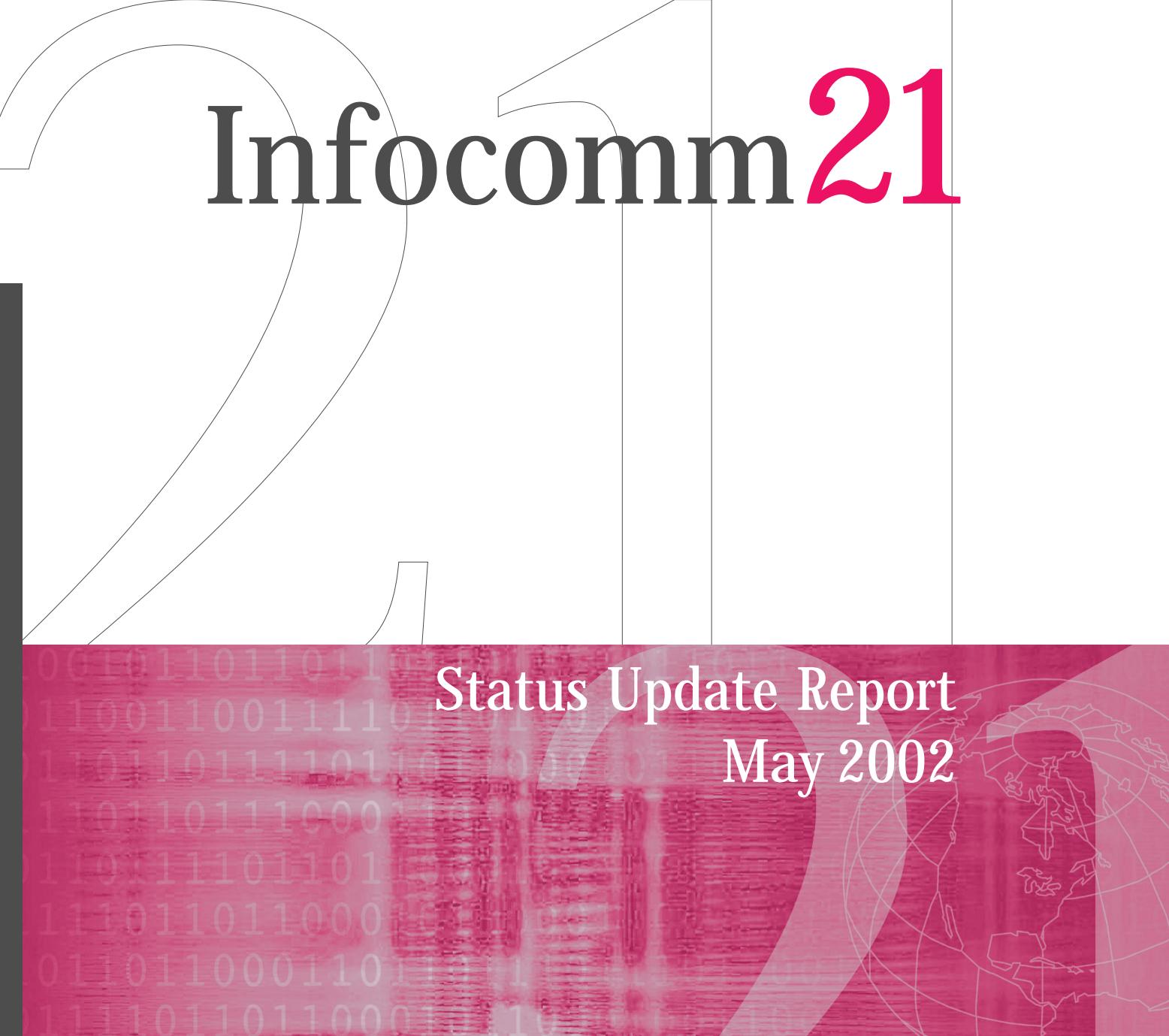
Infocomm 21

Status Update Report
May 2002

Contents

Status Update Report (May 2002)

Infocomm 21:
The Journey Thus Far...

Infocomm 21, released in December 2000, is Singapore's five-year strategic plan for harnessing infocomm technologies to boost Singapore's national competitiveness and improve Singaporeans' quality of life. A year and a half later, we are witnessing substantial progress in the implementation of the Infocomm 21 vision and strategies...

Infocomm 21 Vision

To develop Singapore into a dynamic and vibrant global infocomm capital with a thriving and prosperous e-economy and an infocomm-savvy e-society.
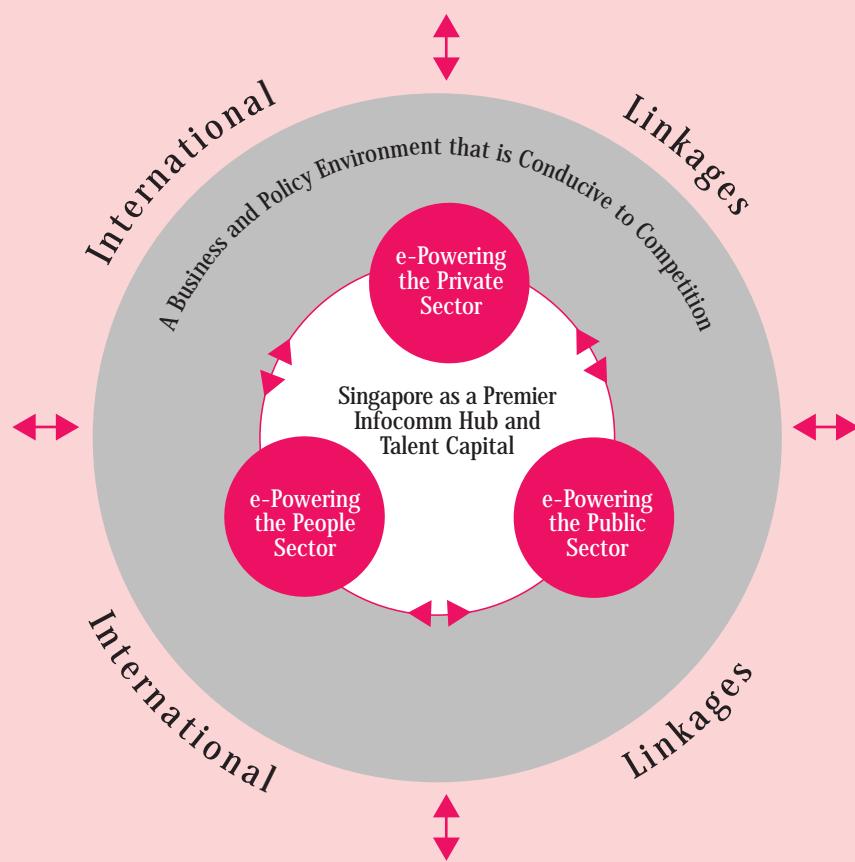
Infocomm 21 Strategies

Infocomm 21 has six strategic thrusts, each with a set of broad strategies as highlighted below:

Strategic Thrusts	Broad Strategies
Singapore as a Premier Infocomm Hub	• Develop a globally competitive telecommunications industry cluster • Create an interactive broadband multimedia industry cluster • Spearhead the development of a wireless industry cluster • Position Singapore as a technology and innovation hub • Build new competitive capabilities and nurture new local enterprises • Foster strategic partnerships and alliances overseas
e-Powering the Private Sector	• Lay a robust foundation for e-business • Catalyse the digital transformation of businesses • Spur consumer demand • Brand Singapore as a global e-business hub

Strategic Thrusts	Broad Strategies
e-Powering the Public Sector	• Encourage the delivery of online public services • Innovate with technology to build new capabilities • Develop thought leadership on e-government • Promote the use of e-government services • Leverage the private sector
e-Powering the People Sector	• Improve the accessibility of infocomm technology • Bridge the digital divide • Encourage the adoption of an e-lifestyle
Singapore as an Infocomm Talent Capital	• Nurture an infocomm-savvy work force • Enhance the capabilities of infocomm professionals • Attract and retain international infocomm talent • Establish Singapore as the region's premier e-learning hub

A Business and Policy Environment that is Conducive to Competition	• Create a pro-business and pro-consumer environment with:
	
	    • A free and open telecommunications market to encourage competition
	
	    • A clear and transparent regulatory framework for sustainable competition
	
	    • Regulatory policies that encourage businesses in emerging sectors to develop quickly
	
	    • Revised regulations to foster the development of new and innovative infocomm-related businesses and services
	
	    • Protection of consumers' interests, welfare and rights

Infocomm 21 - Strategic Thrusts

International Linkages

A Business and Policy Environment that is Conducive to Competition

e-Powering the Private Sector

Singapore as a Premier Infocomm Hub and Talent Capital

e-Powering the People Sector

e-Powering the Public Sector

International Linkages

Singapore as a Premier Infocomm Hub

One of the critical success factors in developing Singapore as a premier infocomm hub is the deployment of a robust national information infrastructure with reliable, efficient and cost-effective connectivity to the rest of the world. Today, Singapore is one of the most connected cities in the world. Singapore offers direct Internet connectivity to over 30 countries, with more than 90 Mbps bandwidth to key markets in the region. As of May 2002, our submarine cable capacity exceeded 21 Tbps.

Strategy: Developing a Globally Competitive Telecommunications Industry Cluster

The final chapter in the liberalisation of Singapore's telecommunications sector was completed on 1 April 2000 when basic telecommunications services were opened to full competition. The cap on foreign ownership of telcos operating in Singapore was also lifted. A new Competition Code of Practice and a new Interconnection Framework were implemented in September 2000. Three 3rd Generation (3G) licenses were issued in April 2001.

> Telecom Asia User Survey 2000 ranked IDA the best regulatory authority in the Asia Pacific.
>
> Asia Pacific Telecoms Index 2001, published by the National University of Singapore's Centre of Telemedia Strategy, ranked Singapore as the most competitive telecoms hub in the region.

• Quick Facts after Full Liberalisation

- 35 licenses issued to facilities-based operators (FBOs)[1]
- 622 licences issued to services-based operators (SBOs)[2]
- International direct dial (IDD) rates to popular destinations have fallen an average of 60%
- Rates for innovative services such as IDD Call Back and IDD Voice Over IP have dropped nearly 80%
- Three 3G licenses were issued at S$100 million each

[1] Includes multinational companies such as AT&T Telecommunications Services Singapore, MCI WorldCom Asia, and Reach International Telecom
[2] FBO and SBO figures were updated on 1 May 2002

### • Growing a Dynamic and Vibrant Infocomm Industry
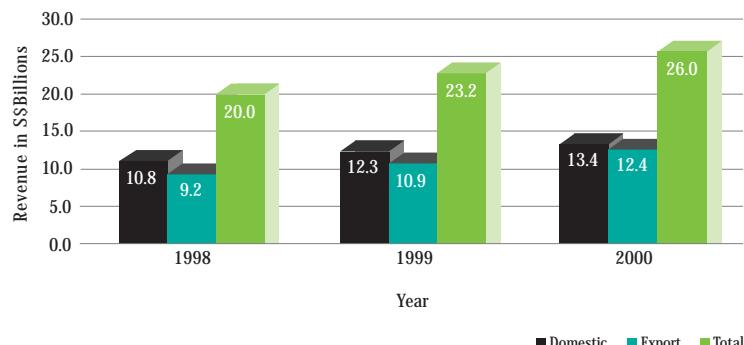
A successful infocomm hub must be propelled by a dynamic and vibrant infocomm industry. Between 1998 and 2000, the local infocomm industry grew robustly by 30%, with revenues jumping from S$20b to S$26b.

The infocomm industry in Singapore was affected by the global recession in 2001, but there is evidence that the industry remains resilient. Although dot-coms were badly hit, other infocomm companies are holding their ground. Singapore continues to attract investments from strong companies in the industry, proving that we remain fundamentally attractive as an infocomm hub.

• Quick Facts on Singapore's Infocomm Industry Performance
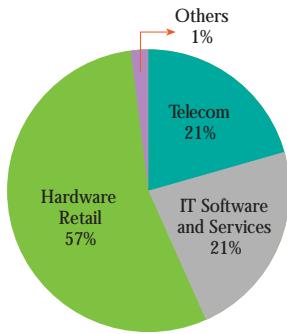
- Infocomm industry revenue grew by 30%, from S$20b to S$26b, between 1998 and 2000

- The infocomm sector's contribution to Singapore's GDP in 2000 was estimated at 5-6%

- Domestic telecommunication services and IT hardware exports were the two major contributors to infocomm industry revenue

Singapore Infocomm Industry Revenue (1998 - 2000)
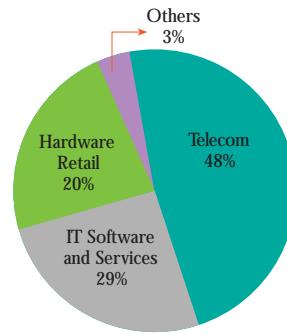
Source: IDA Infocomm Industry Survey 2000 (released in June 2001)

Infocomm Industry Export Revenue Year 2000

Others
1%

Telecom
21%

Hardware
Retail
57%

IT Software
and Services
21%

Infocomm Industry Domestic Revenue Year 2000

Others
3%

Hardware
Retail
20%

Telecom
48%

IT Software
and Services
29%

Source: IDA Infocomm Industry Survey 2000 (released in June 2001)

Strategy: Creating an Interactive Broadband Multimedia Industry

This includes extending the accessibility of the nationwide broadband infrastructure and stimulating the development of broadband content through industry collaboration and targeted programmes under the Singapore ONE initiative.

- As of November 2001, the number of broadband users stood at 950,000; this means one in three Singaporeans above the age of 10 are using broadband
- 99% percent of Singapore's homes, schools, public libraries, community centres and businesses have access to Singapore ONE
- The range of pricing packages has widened, with 12 access providers now in the market
- Singapore has more than 250 broadband applications and services, and over 300 broadband industry players
- Multiple access options are available, such as Asymmetric Digital Subscriber Line (ADSL), Hybrid Fibre Coaxial (HFC) cable modems, Asynchronous Transfer Mode (ATM) and wireless broadband
- Pockets of wireless LAN hotspots have been established in many populated areas - Changi International Airport was one of the first public spaces in the region to offer wireless LAN services
- There are 20 Internet Data Centres in Singapore; some are principal gateways to Asia and other parts of the world
- More than 300 commercial buildings are broadband enabled

Broadband Usage By Location

Location	Percentage of broadband users
Office / Workplace	46%
Home	46%
School	14%
Other Venues (e.g. cyber cafe, public library, etc.)	11%

Source: Survey on Broadband Usage in Singapore, 2001

• Content Development through Industry Collaboration

Singapore's broadband reach extended to at least four million regional broadband users through 'Points of Presence' in Hong Kong, Taiwan and Korea. Some of the recent collaborative efforts and international players who have come on board Singapore ONE include:

Companies	Projects
Ednovation & Pearson Broadband	• Launching School DNA-Knowledge Box in Singapore and the region
webs-tv.net	• Bringing movies, drama serials and satellite TV programmes from Hong Kong, Taiwan, Japan and Korea to Singapore
SingTel & Intertainer (Asia)	• Offering Video-On-Demand (VOD) trials with content from local and global studios, e.g. MTV, Hollywood movies
GIME International	• Launching new online strategy game Century of Three Kingdoms for the region on Singapore ONE
M&E (China), Pandora & Innovatv	• A Singapore-China-US partnership resulting in ME360i.com, a multimedia Chinese language interactive magazine site, featuring travel sights and sounds from Australia and New Zealand
SpeedCast & SingTel/SingNet	• Jointly bringing a web-based news service from Bloomberg Television, Channel NewsAsia, Fashion TV, as well as other ethnic content in many languages
Walker Asia & Cinema Now	• Offering movies and entertainment content from Japan and the US on Singapore ONE for the region
Cyber Business Network & ELTA	• Bringing Taiwanese content, including drama serials, to Singapore

• FastTrack Programme

The International Content Hosting Scheme and Content Enrichment Scheme are part of a S$150m package that enables companies to jumpstart their broadband development with enhanced capabilities and partnerships.

The FastTrack@School programme enables teachers and students to work with education service providers to develop and deliver interactive multimedia lessons and projects. The number of schools that have joined the programme expanded from 27 to 42 in 2002. One out of every three schools in Singapore is incorporating interactive multimedia content in its curriculum.

Strategy: Building Competitive Capabilities and Nurturing Local Enterprises

There are 21 multinational corporations (MNCs)[3] and 160 local partners participating in the Infocomm Local Industry Upgrading Programme (iLIUP). Local companies have benefited from their exposure to the cutting-edge technologies, international marketing expertise, and "go to market" programmes of their multinational partners.

iLIUP Programme

Ecquaria is quickly going global, and its partnership with Sun Microsystems has helped. This potent partnership was made possible through IDA's Infocomm Local Industry Upgrading Program (iLIUP), which pairs local infocomm companies with their multinational peers for technology exchange, marketing expertise and domain knowledge.

Ecquaria CEO Dr. Foong Wai Keong can attest to the benefits. Ecquaria's partnership with Sun, he said, has "helped Ecquaria leapfrog into the region with joint marketing efforts and business development."

To encourage the development of innovative products, a number of grants have been given to our Infocomm Local Enterprises (iLEs) to help them build, as well as market these products overseas. The sales of these products in international markets are expected to generate about S$40m in export revenues over the next three years.

In addition, these local enterprises have participated in a number of IDA-led mission trips to countries such as India and China to seek business opportunities and partners. IDA's regular market reports on infocomm industry developments in China, India and the U.S. are also well received by local infocomm enterprises and IT associations. Additionally, IDA organised several world-class leadership forums for

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[3] The 21 iLIUP MNC partners are: Andersen, Apple, BEA Systems, Borland, Cisco Systems, Compaq, Computer Associates, Hewlett-Packard, IBM, ILOG, InfoTalk, Macromedia, Microsoft, Oracle, Point Information Systems, Progress Software, RealNetworks, Software AG, SpeechWorks, Sun Microsystems and WebGain.

local executives. The forums addressed globalisation strategies, as well as strategies that enhance the enterprises' competitiveness in software development processes through the adoption of internationally recognized standards.

Strategy: Spearheading the Development of a Wireless Industry Cluster

Competition in the mobile cellular industry was first introduced in April 1997 when MobileOne became the nation's second cellular operator. At that time, the mobile phone penetration rate was approximately 13%. The mobile phone penetration rate has grown steadily since the introduction of competition, and has exceeded the fixed line penetration rate since July 2000. As of April 2002, Singapore's mobile phone penetration rate stood at 72.8% - one of the highest rates in the world.

Due to its high mobile penetration rate and an infocomm-savvy population, Singapore is well positioned to be Asia's launch pad for wireless developments. IDA's S$200 million Wired With Wireless programme was launched in October 2000 to jumpstart wireless developments in Singapore. The programme includes a wide range of development initiatives that address different components of Singapore's vibrant mobile market.

Wired With Wireless Programme Framework

• Pilot And Trial Hotspots (PATH) Initiative

The PATH initiative aims to shorten the adoption cycle for innovative wireless applications and services in Singapore through pilots and trials. IDA launched several Calls for Collaboration that encourage wireless industry members to collaboratively propose pilots and trials that address specific strategic gaps in the wireless industry or the needs of a vertical sector.

IDA's first Call for Collaboration brought about an alliance between SingTel, MobileOne and StarHub Mobile, Singapore's three mobile operators, to facilitate the development of common nationwide mobile payment platforms. This collaboration is one of the first in the world that brings competing mobile operators together to develop mobile payment solutions.

Other Calls for Collaboration include areas such as Mobile Work Force Solutions, Wireless Java Solutions and Pervasive Wireless Access.

• Thought Leadership In Wireless Technology

Asia's Inaugural Wireless International Advisory Roundtable (IAR)
Held in conjunction with CommunicAsia 2001, the first Wireless International Advisory Roundtable was convened in June 2001. Initiated under IDA's "Wired With Wireless" programme, the IAR was attended by corporate chiefs of global wireless companies and leading visionaries of the communications revolution. Discussions centred on two key topics: "Worldwide Wireless Trends and Developments" and "Opportunities and Challenges in Asia".

Recommendations by the panel included:
a. The need for Singapore to collaborate with other countries and play the early adopter role in testing innovative applications and services.
b. The government and industry should take greater risks in wireless developments.
c. The industry should focus on selected vertical sectors and develop showcases in those areas.
d. The industry should develop a common collaborative framework across mobile operators, manufacturers and service providers to realise cost effectiveness and shorter time to market.

•Common Platform Steering Committee

Following a recommendation from the International Advisory Roundtable, the Common Platform Steering Committee was formed in October 2001. The committee includes members from IDA, Singapore's three mobile operators, a local wireless research centre, as well as industry members and associations; it provides a platform for the resolution of issues that require consensus, such as interoperability and common codes of practice. Two working groups - the Wireless Java Common Platform Working Group and the Location-Based Services Working Group - were also formed to determine how to fully exploit and accelerate the growth of wireless Java and location-based services in Singapore.

Strategy: Positioning Singapore as a Technology and Innovation Hub

• Infocomm Technology Roadmap

IDA has collaborated with leading infocomm companies, academia and private research institutes to produce technology roadmaps. To date, IDA has organised three major forums to present and discuss these roadmaps with the local infocomm industry. These roadmaps chart the trends and developments in technology, standards, industry and application deployment over a five-year horizon.

| Date	Forum	Theme
24 Jul 2000	1st Infocomm Technology Roadmap Forum	Broadband Access (for fixed-site users) and Mobile Wireless Technologies
20 Mar 2001	2nd Infocomm Technology Roadmap Forum	The Connected Home and Infocomm Security in e-Commerce
28 Feb 2002	3rd Infocomm Technology Roadmap Symposium	Next Generation Optical Network and Photonics and Next Generation Internet Applications
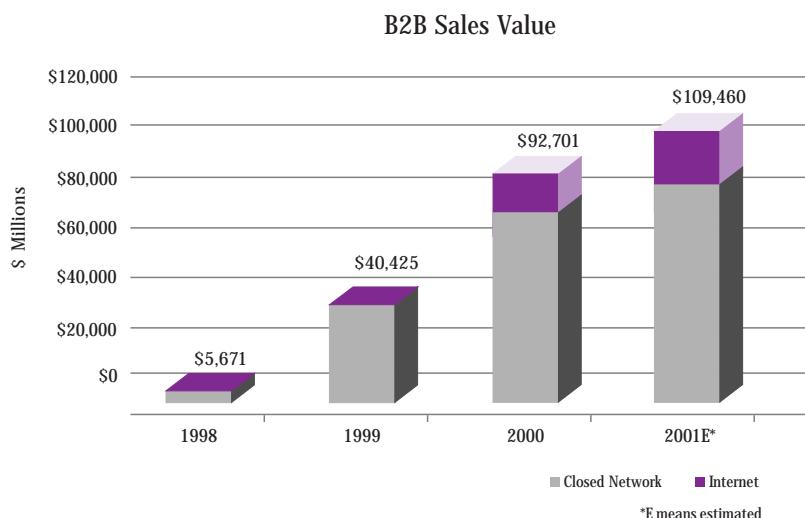
e-Powering the Private Sector

In the year 2000 we saw sharp increases in the volume and value of e-commerce transactions, which more than doubled from the previous year. This, together with a 30% increase in the number of e-commerce-enabled companies, demonstrates the promise of e-commerce in Singapore. Despite the slowdown in 2001, there are signs that e-commerce is still growing in Singapore.
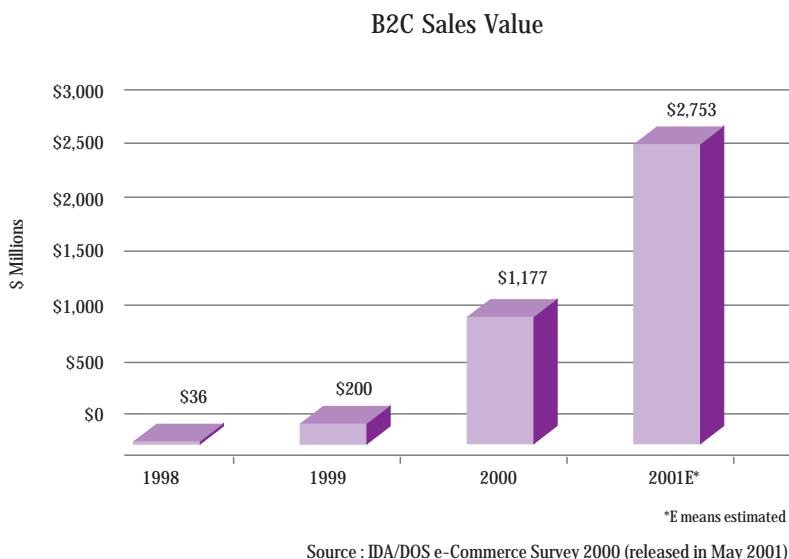
e-Commerce Transaction Values Continue to Grow Strongly

	1999 (S$)	2000 (S$)	2001 est. (S$)
B2B	40.00b	92.00b	109.00b
B2C	0.20b	1.17b	2.75b
e-Procurement	10.90b	17.90b	25.00b

Source : IDA/DOS e-Commerce Survey 2000 (released in May 2001)

B2B Sales Value

Source : IDA/DOS e-Commerce Survey 2000 (released in May 2001)

B2C Sales Value

*E means estimated

Source : IDA/DOS e-Commerce Survey 2000 (released in May 2001)

Strategy: Laying a Robust Foundation for e-Business and Spurring Consumer Demand

Singapore was rated first in Asia and fifth worldwide for its e-commerce infrastructure in the World Competitiveness Yearbook 2001. The Economist Intelligence Unit 2001 ranked Singapore top in Asia and seventh internationally for e-readiness.

• Public Key Infrastructure (PKI)

In March 2001, the PKI Forum Singapore was formed. The industry group promotes the use of PKI[1] for secure online transactions. To facilitate the use of PKI in cross-border e-trade, Singapore signed a Memorandum of Understanding with Japan and Korea to achieve interoperability for secure online platforms. Singapore, Japan and Korea also formed the Asia PKI Forum[2] to promote the international adoption of PKI.

• Electronic Payments

IDA and the Monetary Authority of Singapore are collaborating on a number of national e-payment initiatives that will ensure the availability of a comprehensive suite of cost-effective e-payment services in Singapore. Some

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[1] PKI establishes the identity of parties engaged in an online transaction and ensures that data is not altered in transit and remains confidential. It is recognised as one of the most secure platforms for e-commerce transactions. The PKI Forum Singapore includes representatives from: SingTel Mobile, DBS Bank, Baltimore Technologies (SEA), Cisco Systems, ID.Safe, Netrust, Phillip Securities, CrimsonLogic, NEC, VISA International,TrustAsia, NETS, ECNet, PrivyLink, Identrus, BeXcom SEA, HP Consulting SEA, the Monetary Authority of Singapore and IDA

[2] Comprises Australia, China, Chinese Taipei, Hong Kong, Japan, Korea, Malaysia and Singapore.

examples include national cheque truncation and the development of a national e-payment contactless Smart Card Standard for the retail and transport sectors.

Key industry partners and various government agencies are working to establish a national framework, code of business practice and standards for electronic bill presentment and payment (EBPP) in Singapore.

• Review of Electronic Transactions Act

Enacted in 1998, the Electronic Transactions Act facilitates the legal recognition of electronic transactions and electronic signatures through the use of digital certificates. A review of the act is in progress to ensure that Singapore's laws and framework remain relevant and competitive in the changing e-commerce landscape.

• National Trust Council and TrustSg

The National Trust Council was formed in March 2001 to build confidence in e-transactions among businesses and consumers, and to promote e-commerce growth in Singapore. One of this industry-led body's first initiatives is TrustSg, a national trust mark programme that promotes sound e-business practices. The council has also released a Code of Practice for businesses that establishes minimum standards that must be met before businesses can obtain trust mark certification.

• Model Data Protection Code for the Private Sector

The National Internet Advisory Committee (NIAC) has revised its earlier e-commerce code into a more comprehensive Model Data Protection Code for the private sector. The code is modelled on internationally recognized standards and establishes minimum standards for electronic data protection. It also promotes the harmonisation of data protection principles among various sectors.

• Industry Content Code Of Practice

The NIAC has developed an Industry Content Code to promote a culture of responsibility and industry self-regulation. The code was drawn up in consultation with industry members and it lists industry best practices that will complement existing regulations and codes of practice governing Internet content in Singapore. The NIAC will continually refine and update the Industry Content Code to ensure that it remains relevant in the rapidly evolving Internet industry.

Strategy: Catalysing the Digital Transformation of Businesses

Nearly 17,000 small-to-medium enterprises have incorporated or enhanced e-commerce capabilities through a S$30m scheme managed jointly by IDA and the Singapore Productivity & Standards Board (now called Spring Singapore). The IDA e-Business Industry Development Scheme (e-BIDS)[3] has funded 22 projects that are projected to contribute more than S$1b in incremental e-commerce transaction value.

A quick look at some e-transformation projects that were catalysed by IDA:

- Pan-Asian reinsurance portal for insurance claims processing
- Pan-Asian secured trade documentation – a platform that enables exchange of secure trade documents online
- First peer-to-peer implementation of RosettaNet[4] standards in electronics manufacturing in Singapore
- First Asia-wide portal for financial bonds trading
- Library exchange for automation of online book requisition and payment processes for major book buyers in Singapore
- Commodities trading portal that incorporates supply chain management solutions to meet 370 suppliers' needs
- Singapore's first mobile payment system for a major consumer transport organisation
- Online education services that enable students anywhere in the world to attend Internet courses around the clock
- Electronic marketplace for buyers and sellers in the semiconductor industry

[3] eBIDS is targeted at companies that already have e-commerce capabilities and wish to enhance their e-business value creation. These companies include e-commerce exchanges and hubs.
[4] RosettaNet is a consortium of high-tech manufacturing companies that aims to lower B2B transaction costs, speed time to market and reduce inventories in the high-tech supply chain, using open, XML-based business process standards.

To promote Singapore as an e-learning hub, IDA, the Ministry of Education and Singapore IT Federation funded an e-Learning Competency Centre in December 2001 at the National Institute of Education. It seeks to provide market intelligence and propagate and promote e-learning standards, certification and adoption.

Some other e-learning initiatives supported by IDA are:

- RosettaNet's global e-learning network for the manufacturing industry
- Occupational safety and health standards and practices for officers of the chemical/petrochemical industry
- Continuing education/refresher programmes for the Singapore Dental Association
- e-learning certification/enrichment programmes for the hospitality and tourism industry with Temasek Polytechnic
- Preparation/enrichment programmes for full-time national servicemen in collaboration with Mindef.com
- Institute of Technical Education's (ITE) e-Tutor system that links 13 ITE campuses nationwide

• Thought Leadership In e-Business Transformation

The User Forum 2001 was the first vendor-neutral event designed specifically to address the issues faced by end-users and also share successes in implementing e-business operations. Initiated by IDA and organised jointly with several government agencies, the User Forum 2001 addressed the four key vertical sectors: manufacturing, logistics, finance and banking, and retail. The forum attracted some 200 CEOs, CFOs and CTOs from top companies in Singapore and key representatives from chambers of commerce and trade associations.

e-Powering the Public Sector
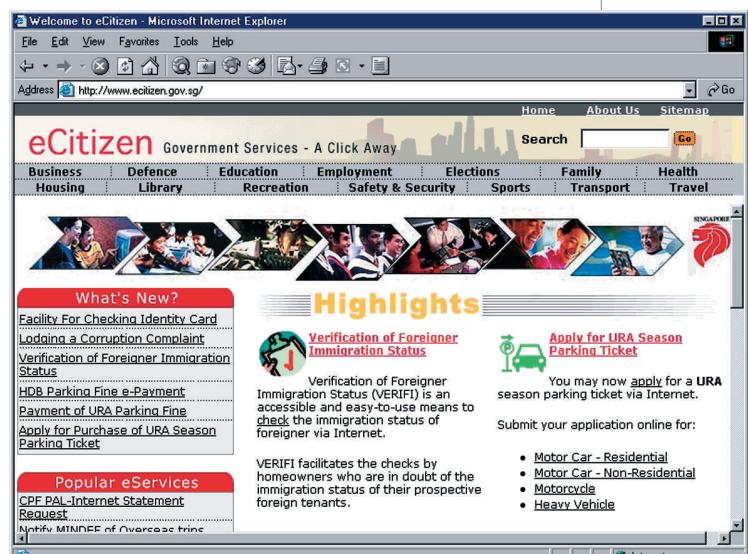
The e-government action plan seeks to encourage the spread of electronic services delivery, build new capabilities, develop thought leadership on e-government and innovate with infocomm technology.

Strategy: Encouraging the Delivery of Online Public Services

The eCitizen portal www.ecitizen.gov.sg was first launched in 1999 with 170 e-services as a first stop for a wide range of online government services and information. The portal was enhanced in October 2001 with the number of e-services offered increasing to more than 560. Currently there are 14 categories of services available online, such as family, housing, education, health, employment, business, transport, travel, elections and defence. The site had more than one million hits and the top five e-services had over 400,000 transactions per month as of December 2001.

Developed with citizens' needs in mind, the portal offers information and services in customer-centric packages that integrate government services across different government agencies. Instead of interacting with multiple government agencies, citizens are able to submit single applications for related licences and permits, and be notified of the outcome of their applications electronically. This means simplified processes and improved processing time for citizens.

By January 2002, 66% of all government services that are suitable for online delivery were available electronically. We aim to deliver 100% of feasible online services by December 2002.

• Highlights of eCitizen Applications

Examples of eCitizen Services

- Renewal of driver's licence
- Online booking of sports facilities
- Booking of marriage registration date
- Inquiry of CPF statements
- eFiling of income tax

In the year 2001, nearly 700,000 taxpayers (36%) filed their taxes online.

Examples of eCitizen Service Packages

- Start a business
- Search for jobs
- File a marriage notice
- Buy property

To improve the accessibility of government e-services, eCitizen help centres have been established at 24 Community Development Councils and Community Clubs/Centres. The aim is to provide convenient access and assistance for those who cannot afford computers with Internet access or those who need help to transact online with the government.

A Government Electronic Business (GeBIZ) system benefits those who do business with the government. This system facilitates procurement and revenue tender activities between the public and the private sector with an integrated one-stop approach. GeBIZ is one of the largest government electronic commerce initiatives.

Since December 2000, government agencies have been buying items such as PCs and peripherals online, using an electronic catalogue and the GeBIZ system. Government agencies can also issue Invitations to Quote online when seeking items and services that cost less than S$50,000. As of January 2002, GeBIZ had attracted over 4,000 users and 139 government procurement entities. The total transaction value for GeBIZ purchases has exceeded S$170m.

Owing to these achievements, a study conducted by Accenture ranked Singapore as the world's second best e-government in the years 2001 and 2002. eCitizen received the bronze award at the October 2000 Commonwealth Association for Public Administration and Management (CAPAM) International Innovation Awards Program.
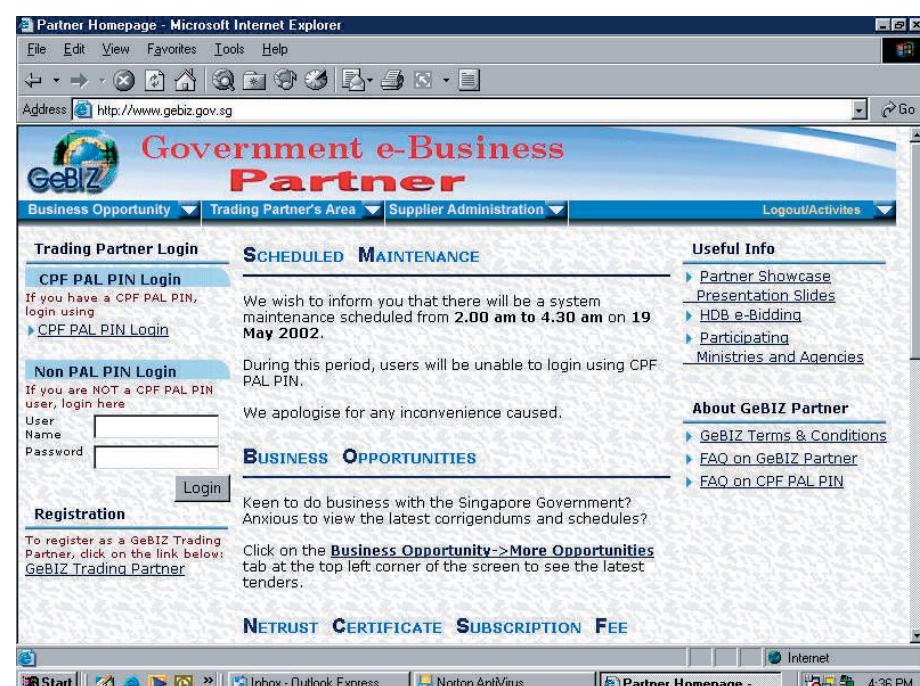
Strategy: Innovating with Technology to Build New Capabilities and Capacities

Singapore's e-government vision has led the civil service to deploy technology to develop a range of innovative new services and operational processes.

Examples include:

Public Service Infrastructure (PSi)
- A shared infrastructure for rapid development and deployment of government e-services
- Provides a suite of application services commonly required by government agencies in the development of their e-services
- Services include an e-service generator, payment services, security services and e-service management tools

Anywhere Computing Environment

- Enables easy and secure access to government information resources anytime, anywhere, using any media
- Improves service delivery, communication and work processes
- Exploits infocomm technologies for networked government
- Builds reliable and scalable infrastructure to support e-government vision
- The Anywhere Computing Environment is built on four components:

  a. A broadband infrastructure for government, or BIG, which provides various connection networks that have broadband capability to support intensive bandwidth-consuming applications
  b. A secure internetworking environment using virtual private network, or SIEVE, which uses private network encryption, to ensure secure communication amongst government agencies
  c. A government access infrastructure, or GATE, which provides access services to government resources anywhere, anytime. For example, a public servant in Singapore can access government resources from home through a subscription to the Singapore broadband network or any Internet service provider
  d. GUIDE (government ubiquitous integrated directory of services), which provides a central government directory database for access control and authentication

e-Powering the People Sector

One of the goals of Infocomm 21 is the widespread use of infocomm technology by citizens. Referred to as "living the e-lifestyle," the use of infocomm technology enables citizens to improve their quality of life. IDA has encouraged the e-lifestyle by generating an awareness among citizens of the benefits that an e-lifestyle offers. The approach seeks to encourage greater infocomm adoption and a higher level of infocomm literacy among Singaporeans.

IDA has launched three annual, public education campaigns, called e-Celebrations, with the help of many public- and private-sector organisations. In 2001, e-Celebrations reached out to 144,000 homemakers, 110,000 students and 42,000 senior citizens. Thousands of professionals and workers have also benefited, as have 2,000 people with disabilities. e-Celebrations 2002 offers a year-long series of e-lifestyle events.
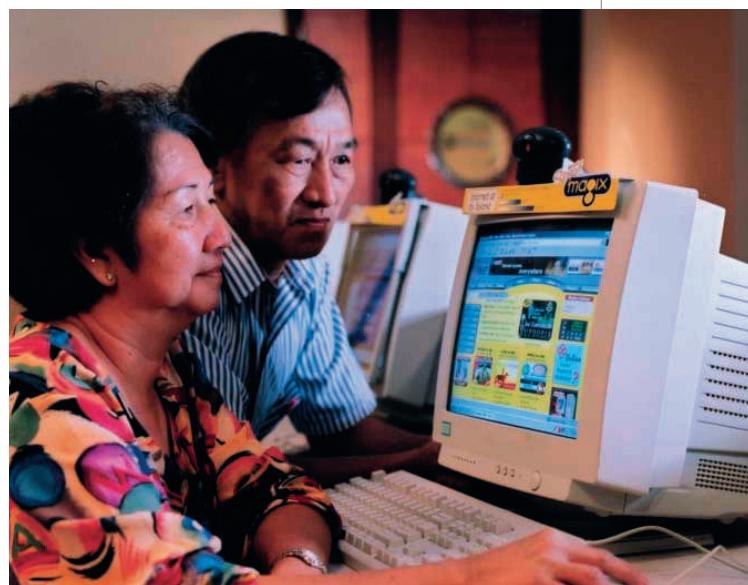
• Fast Facts Singapore - Getting Connected

- 66% of the population is knowledgeable in the use of the PC[1]
- 64% of households have at least one computer[2]
- Nearly 57% of homes have Internet access[2]
- Mobile penetration reached 72.8% as of April 2002
- There are 10,000 public Internet access points located throughout Singapore[4]

Singapore's residents aren't alone in their appreciation for IDA's enthusiastic approach to the e-lifestyle. The World Information Technology and Services Alliance (WITSA) gave Singapore the Award for Excellence in the Public Sector in June 2000, in recognition of its efforts to promote an e-lifestyle.

Strategy: Improving Infocomm Accessibility for All

To increase PC ownership and access, IDA engaged multinational corporations, local enterprises and the community to assist in initiatives such as the PC Reuse Scheme and IT Resource Centres for self-help groups. These initiatives reach out to needy households and late adopters of infocomm products and services. To date, more than 5,000 needy households and 82 IT Resource Centres have benefited.

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[1] IDA Infocomm Literacy Survey 2000
[2] IDA Survey on Infocomm Usage in Households 2001
[3] IDA compiled Industry Statistics
[4] IDA Data
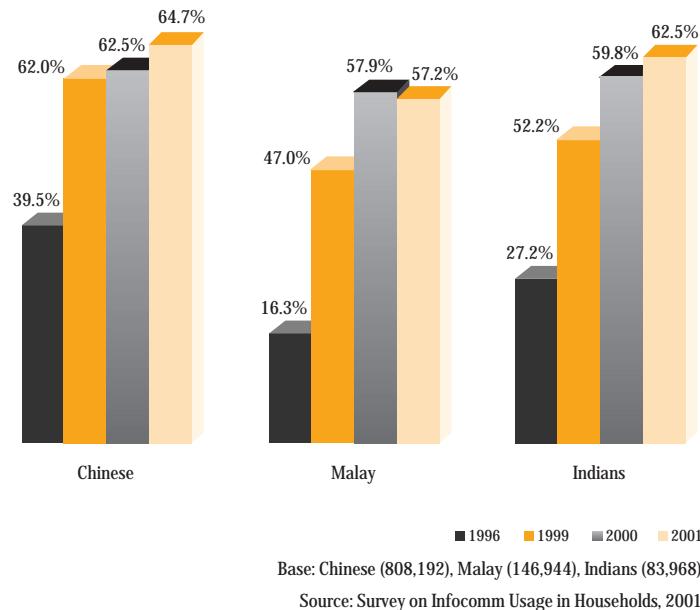
The EasyPC Plan has benefited many Singaporeans. It is championed by the National Trades Union Congress and enables union members to own a PC with Internet connectivity for less than S$1 a day. This scheme has helped more than 4,000 union members to date.

More than 1,200 people have volunteered for IDA's e-Ambassador programme. These volunteers, early adopters of infocomm products and services, inspire late adopters to embrace an e-lifestyle by introducing them to infocomm services and applications.
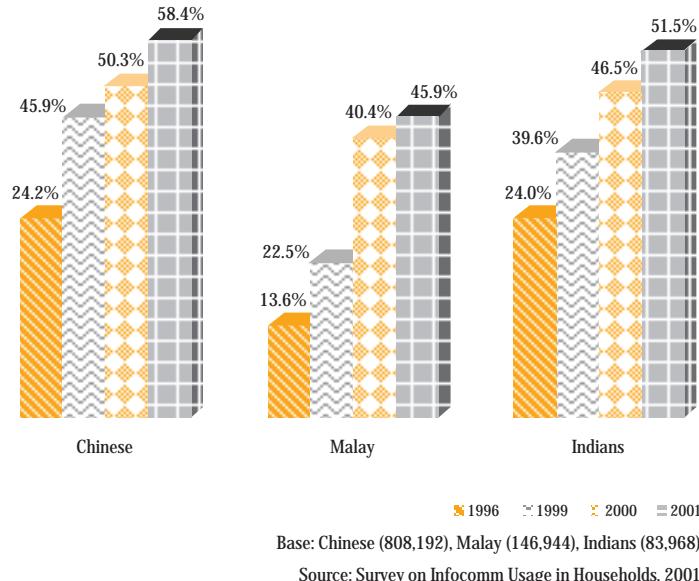
Strategy: Bridging the Digital Divide

Singapore is successfully narrowing the digital divide that exists between various ages, income levels, ethnic backgrounds and educational qualifications.
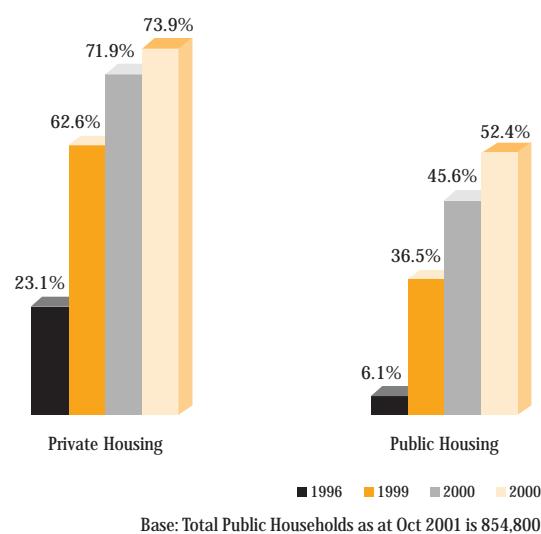
Computer Ownership Among Chinese, Malay And Indian Households

Chinese: 39.5% (1996), 62.0% (1999), 62.5% (2000), 64.7% (2001)
Malay: 16.3% (1996), 47.0% (1999), 57.9% (2000), 57.2% (2001)
Indians: 27.2% (1996), 52.2% (1999), 59.8% (2000), 62.5% (2001)

Legend: ■ 1996 ■ 1999 ■ 2000 ■ 2001

Base: Chinese (808,192), Malay (146,944), Indians (83,968)

Source: Survey on Infocomm Usage in Households, 2001

Internet Access Among Chinese, Malay And Indian Households

58.4%
50.3%
45.9%
24.2%

Chinese

45.9%
40.4%
22.5%
13.6%

Malay

51.5%
46.5%
39.6%
24.0%

Indians

■ 1996   ⋈ 1999   ⋈ 2000   ▤ 2001

Base: Chinese (808,192), Malay (146,944), Indians (83,968)

Source: Survey on Infocomm Usage in Households, 2001

Internet Access In Private And Public Housing

73.9%
71.9%
62.6%
23.1%

Private Housing

52.4%
45.6%
36.5%
6.1%

Public Housing

■ 1996   ■ 1999   ■ 2000   ■ 2000

Base: Total Public Households as at Oct 2001 is 854,800

Total Private Households as at Oct 2001 is 194,800

Source: Survey on Infocomm Usage in Households, 2001

• National Internet Programmes Across Ethnic Groups

To cater to the needs of Singapore's multi-racial society, Malay and Tamil Internet Steering Committees were formed to promote Internet usage within these two communities. IDA assists in developing and aggregating compelling local content in Malay and Tamil. An example is ePedoman, the first-of-its-kind, bi-directional, English-to-Malay translation portal launched in March 2001. The two steering committees' initiatives reached out to more than 780,000 individuals in the Malay community and 500,000 individuals in the Tamil community to create awareness and to encourage adoption of an e-lifestyle. A National Chinese Internet Programme has also been very successful.
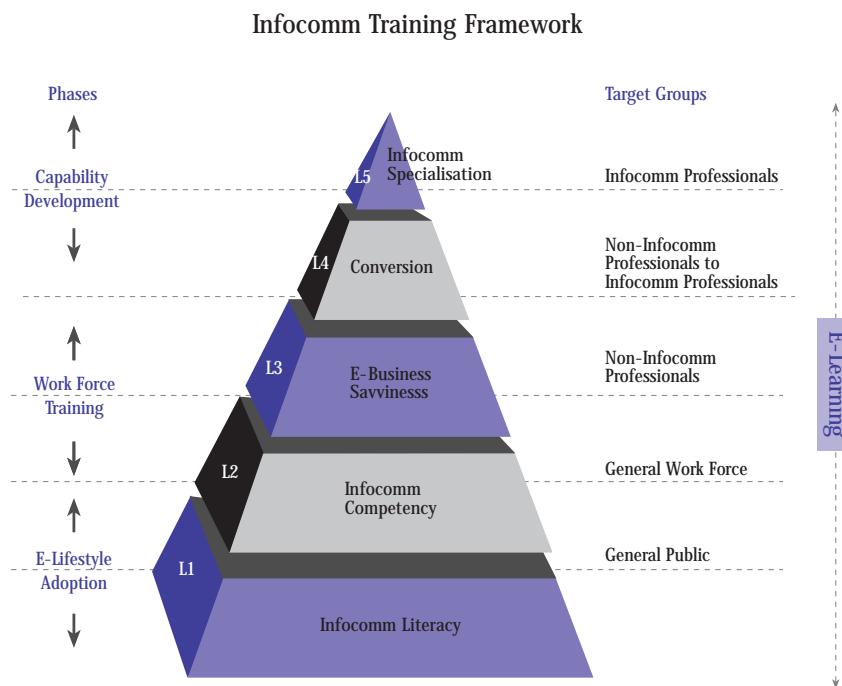
## • Special Infocomm Programmes for the Disabled

IDA worked with the National Council of Social Services and eight private organisations to launch SPED.com, which helps special education (SPED) students use infocomm technology at school. There is now a trust fund for special education students to purchase PCs and assistive equipment. Companies have also donated hardware and software to special education schools.

The e-Celebrations 2001 public education campaign included a comprehensive showcase of technologies designed to assist and empower the disabled community. Called Assistive Technology 2001 (AT 2001), this showcase attracted 2,000 people with disabilities and 5,000 caregivers, educators and potential employers of the disabled. AT 2001 ensures that people with disabilities are not left out of the digital revolution.

Singapore as an Infocomm Talent Capital

To establish Singapore as an infocomm talent capital that offers a range of highly sophisticated infocomm skills and an infocomm-savvy work force, IDA develops and promotes manpower programmes that accelerate infocomm training and skill acquisition. Singapore also continues to attract the best international talent for its vibrant infocomm industry.

Infocomm Training Framework

- The National IT Literacy Programme (Level 1) was launched in June 2001 and has trained more than 87,000 people
- The Infocomm Competency Programme (Level 2) was launched in August 2001 and has trained over 36,000 people
- The e-Biz Savviness Programme (Level 3) was launched in August 2001 and has enrolled over 150 people to date
- The Strategic Manpower Conversion Programme (Level 4) had 500 trainees as of March 2002
- The Critical Infocomm Technology Resource Programme (Level 5) has trained 9,500 professionals since its launch in 1996
- The Infocomm Training and Attachment Programme (Level 5) created 60 new jobs at the Bioinformatics Institute

Strategy: Nurturing an Infocomm-Savvy Work Force

- 38% of the working population knows how to use a PC and is competent in at least one online transaction and four general, productivity-enhancing office applications

Strategy: Enhancing the Capabilities of Infocomm Manpower

- Singapore's pool of infocomm manpower exceeded 105,000 in 2000, a sharp increase over the previous year's pool of 93,000 Infocomm individuals (Infocomm Manpower Survey 2000)
- The top five essential skills for organisations are: application and software development, Internet technologies, networking, IT project management and e-commerce development
- The National Infocomm Competency Centre offers certification of infocomm skills to ensure benchmarking against acceptable industry best practices
- Cross-certification of important infocomm skills with regional countries including Japan

Strategy: Establishing Singapore as the Region's Premier e-Learning Hub

e-Learning is strategic to Singapore and its businesses. IDA recognizes the importance of e-learning to build manpower capabilities, instil lifelong learning, bridge the digital divide, and help Singapore compete in the knowledge-based economy. IDA supports e-learning in three key areas: building capacities, piloting industry-wide infrastructure, and promoting thought leadership.

Strategy: Attracting and Retaining International Infocomm Talent

Singapore continues to enhance its infocomm work force by attracting infocomm talent from all over the world.

The World Competitiveness Yearbook 2000 recognised Singapore's immigration laws as the most flexible, enabling companies to hire international talent easily.

The Ministry of Manpower and IDA work together to ensure that nearly all infocomm-related employment pass applications are processed within two weeks - fast by any international standard.

A Pro-Business and Pro-Consumer Environment

IDA has implemented a variety of policies and initiatives that aim to create an environment conducive to both collaboration and competition. Some examples follow.

- Singapore's telecommunications sector was opened to full competition in April 2000. Limits on foreign equity investments were also lifted.

- A Competition Code of Practice and an Interconnection Framework for the telecommunications industry were implemented in September 2000.

- The Writing Down Allowance for Approved Intellectual Properties provides favourable tax treatment for intellectual property; it was introduced in February 2001.

- The National Trust Council was formed in March 2001 to promote e-commerce growth by building business and consumer confidence in e-transactions.

- A review of the Electronic Transactions Act is under way to ensure that the relevant laws and framework remain relevant and competitive.

- The International Content and Hosting Scheme and Content Enrichment Scheme have enabled companies to accelerate their broadband development with enhanced capabilities and partnerships.

- IDA's Calls for Collaboration (CFCs) in mobile payment, mobile work force, and wireless Java solutions have encouraged industry members to collaboratively develop and pilot new wireless solutions.

- A variety of infocomm training programmes have been launched under IDA's Infocomm Training Framework, which ensures that Singapore's work force is well supplied with highly skilled professionals and technology-savvy workers.

Recent Initiatives

Additional efforts include the Registrar Accreditation Scheme. Launched in March 2002 by the Singapore Network Information Centre, an IDA subsidiary, the scheme has promoted greater competition among Singapore's domain name registrars.

IDA has also taken several steps to achieve greater regulatory transparency. Since 16 April 2002, IDA has made public its regulatory decisions on its investigation findings and enforcement actions. And in May 2002, IDA released its Spectrum Management Handbook and National Numbering Plan, which detail the policies, rules and procedures that IDA has established to manage spectrum and number resources.

Strategic Alliances and Partnerships

IDA has also pursued bilateral and multilateral relationships and agreements to further enhance business opportunities for the local infocomm industry. The strategic alliances and partnerships that have been established are also effective in advancing the regional infocomm industry, which is critical in our increasingly globalised and interconnected world.

Through the regional eASEAN initiative, Singapore is collaborating with its ASEAN neighbours to enhance the economic growth and competitiveness of the region, facilitate infocomm investments and trade in infocomm goods and services, and develop infrastructural and human resource capabilities for the growth of e-commerce, e-government and e-society.

Singapore has been working closely with India and China to establish industry-to-industry strategic alliances and partnerships. The Memorandum of Understanding between IDA and the Confederation of Indian Industry has led to corporate alliances, collaboration between industry associations, and cross-border corporate investments. IDA has established overseas offices in Bangalore, India and Shanghai, China in order to have a local presence to better identify the business opportunities in these two emerging markets.

Free Trade Agreements

IDA has been heavily involved in negotiations on free trade agreements with Singapore's leading trade partners in the infocomm sector.

Implemented:
WTO Basic Telecom Agreement
ASEAN Free Trade Agreement
Agreement between New Zealand and Singapore on a Closer Economic Partnership

Negotiations Concluded in 2001 (pending ratification):
Japan-Singapore Free Trade Agreement
European Free Trade Area (Iceland, Liechtenstein, Norway and Switzerland)

In Progress:
Agreements with the USA, Australia, Canada, Mexico, ASEAN-China

The Journey Continues...

Given the infocomm industry's dynamic nature, it is imperative that Singapore responds creatively and innovatively to new challenges and opportunities. Some of the assumptions that were used in the development of Infocomm 21 in the year 2000 may have to be revisited in the light of discontinuities and emerging trends over the past year. These may have an impact on the strategic thrusts and some of the broad implementation strategies.

IDA has embarked on a review of Infocomm 21, which entails the identification of new industry clusters or high-growth areas, especially in the converging industries of IT, telecommunications, broadcasting, digital media, entertainment and consumer electronics.

Other areas of emphasis will include nurturing a supportive environment and putting in place the requisite resource conditions for enhancing the competitiveness of the infocomm sector, both at the firm level and industry cluster level.

To spur innovation among local infocomm companies, more emphasis will be placed on developing an infocomm-savvy society that can make sophisticated demands on the industry.

There will also be a stronger focus on establishing international linkages that leverage external resources and expertise to complement Singapore's core strengths. One major initiative that is being conceptualised and promoted is Connected Asia.

The future looks bright for the infocomm industry despite the gloomy setbacks of the past year. With perseverance and strong collaboration among the public, private and people sectors, Singapore is assured of realising the vision of Infocomm 21.