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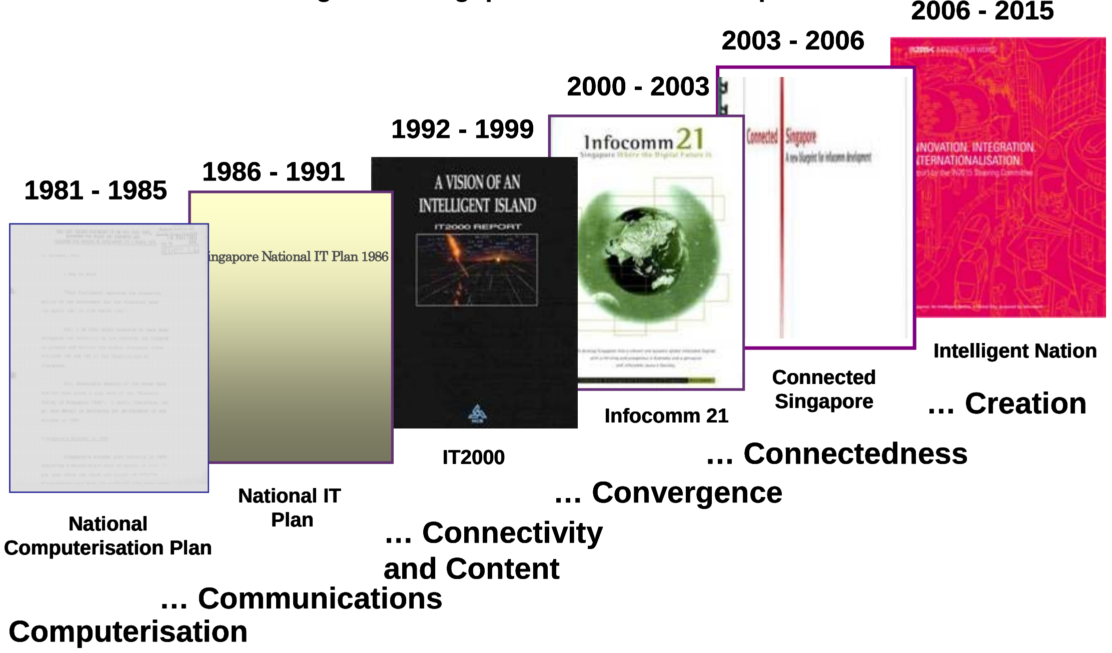
ICT LANDSCAPE[1] / ICT STATISTICS COLLECTION AND DISSEMINATION IN SINGAPORE

INTRODUCTION

1 ICT is important to Singapore's growth. ICT provides the necessary bridge to the increasingly interconnected world and helps Singapore reach the global markets beyond its shores. Since the first IT masterplan, the Civil Service Computerisation Programme (CSCP) in 1981, the Singapore government has formulated and implemented six ICT masterplans, each focused on a different developmental theme (Figure 1).

Figure 1: Singapore's Six ICT masterplans



2 As a relatively mature economy, and nearing the technological frontier, the challenge for Singapore is to find new development and growth models. The latest ICT masterplan, Intelligent Nation 2015 (or "iN2015"), launched in June 2006 is intended to support the country's transformation into a knowledge-based economy with innovation-led growth. iN2015 has the following strategic thrusts:

- Spearhead the transformation of key economic sectors, government and society through more sophisticated and innovative use of ICT;
- Establish an ultra-high speed, pervasive, intelligent and trusted ICT infrastructure;
- Develop a globally competitive ICT industry; and
- Develop an ICT-savvy workforce and globally competitive ICT manpower.

3 The ICT sector is a key component of Singapore's economic

[1] Please see Annex A for a summary of the ICT landscape.

infrastructure. The sector saw double digit growth in 2006 to reach S$45 billion in revenue (Figure 2). Mobile penetration and household broadband penetration also showed rising trends, reaching 112.8% and 74.4% as at September 2007. Residents are also taking up higher speed broadband packages (Figure 3).

Figure 2: ICT Industry[2] Revenue 2002 – 2006

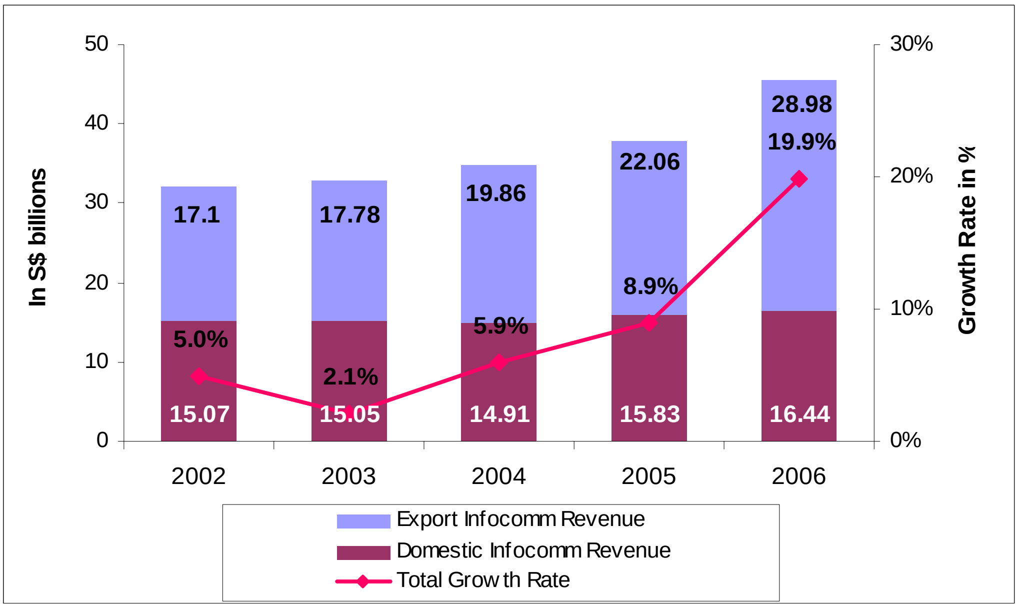
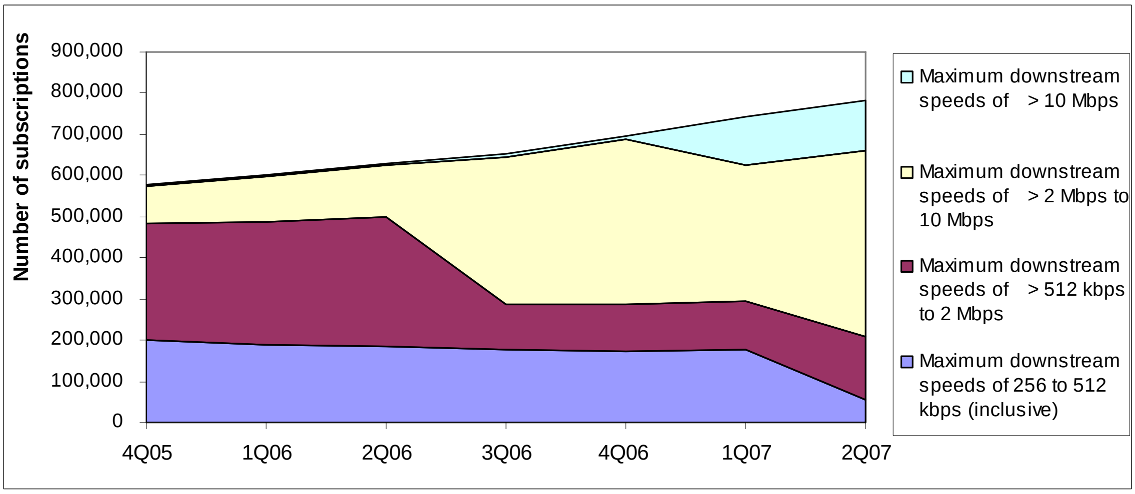


Figure 3: Residential Broadband Subscriptions by Speed



4 Many iN2015 projects such as the Next Generation National ICT Infrastructure (NGNII)[3], Standard ICT Operating Environment (SOE)[4], TradeXchange, Infocomm@Seaport have been deployed. To guide the formulation and fine-tuning of strategies and programmes moving forward, a robust data collection and dissemination framework is critical to provide useful insights to support analysis and policy formulation in the right direction.

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[2] Comprising hardware; software; IT services; telecommunication services; and content services.
[3] The NGNII comprises an intelligent, pervasive, ultra high-speed wired broadband infrastructure and a ubiquitous wireless network throughout Singapore.
[4] The SOE project standardises the desktop, messaging and network environment for the public sector and improves overall operational and cost efficiency.

ICT STATISTICS IN SINGAPORE

5 The Infocomm Development Authority of Singapore (IDA) is the agency responsible for regulating the telecommunication sector and developing and promoting the growth of the ICT industry in Singapore. The IDA is also the agency in charge of collecting the official ICT statistics for Singapore. This is done through two main means: surveys; and administrative data. The following paragraphs outline the main findings from the surveys.

Surveys

6 The IDA conducts the various surveys listed in Table 1:

Table 1: IDA Surveys

Survey	Scope of Survey	Frequency
ICT Usage by Households and Individuals	To collect statistics on ICT adoption by the households and individuals in Singapore	Annual
Business ICT Usage Survey	To collect statistics on ICT adoption by the businesses in Singapore	
ICT Manpower Survey	To collect statistics on ICT manpower, ICT jobs and vacancies	
ICT Industry Survey	To determine the market performance of the ICT industry in Singapore	

7 Annual Survey on ICT Usage in Households and by Individuals: This survey aims to:

a. Gauge the ownership of ICT appliances and subscriptions to ICT services in Singapore households and among the resident population;

b. Assess the sophistication and extent of ICT usage in Singapore households and among the resident population; and

c. Identify the barriers to, and motivations for, ICT adoption and usage in Singapore households and among the resident population.

8 The survey report presents the findings on ICT usage among households and among residents in various age groups[5] in Singapore. The 2006 survey found that home Internet penetration rate in Singapore increased from 66% to 71% in 2006 and that home computer penetration rate in households with school-going children reached 88% (Charts 1 and 2). These are important indicators to track the progress towards meeting the iN2015 goals of 90% of homes using broadband and 100% computer ownership in households with school-going children by 2015.

[5] The age groups are: 10-14 years; 15 – 29 years; 30 - 44 years; 45 – 59 years and 60 years and above.

Chart 1: Home Internet Penetration Rate

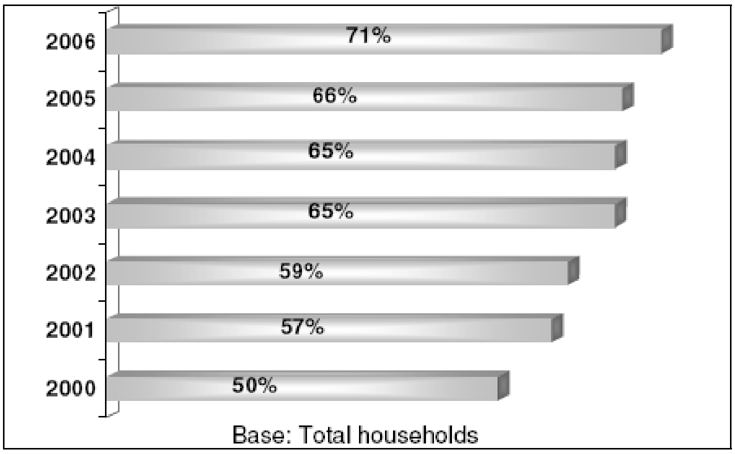
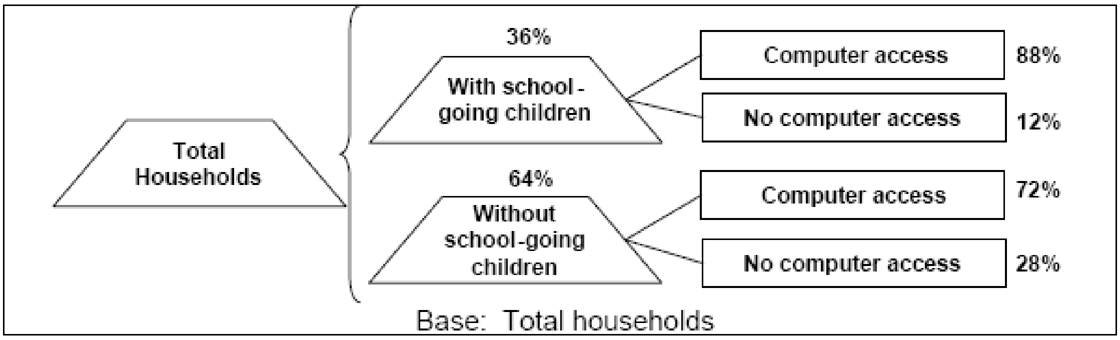
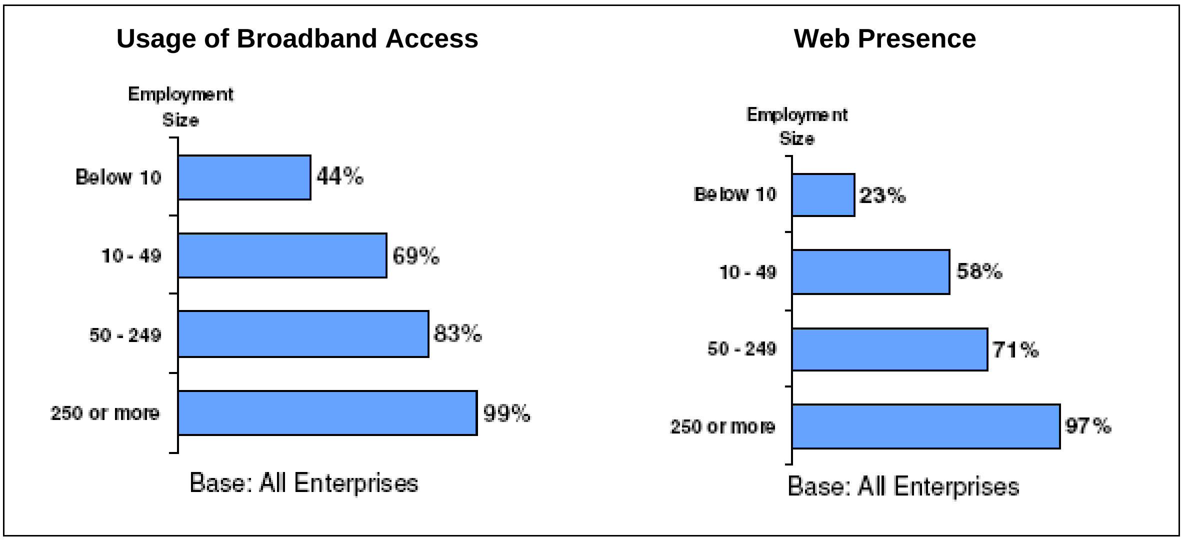


Chart 2: Home computer penetration by households with school-going children



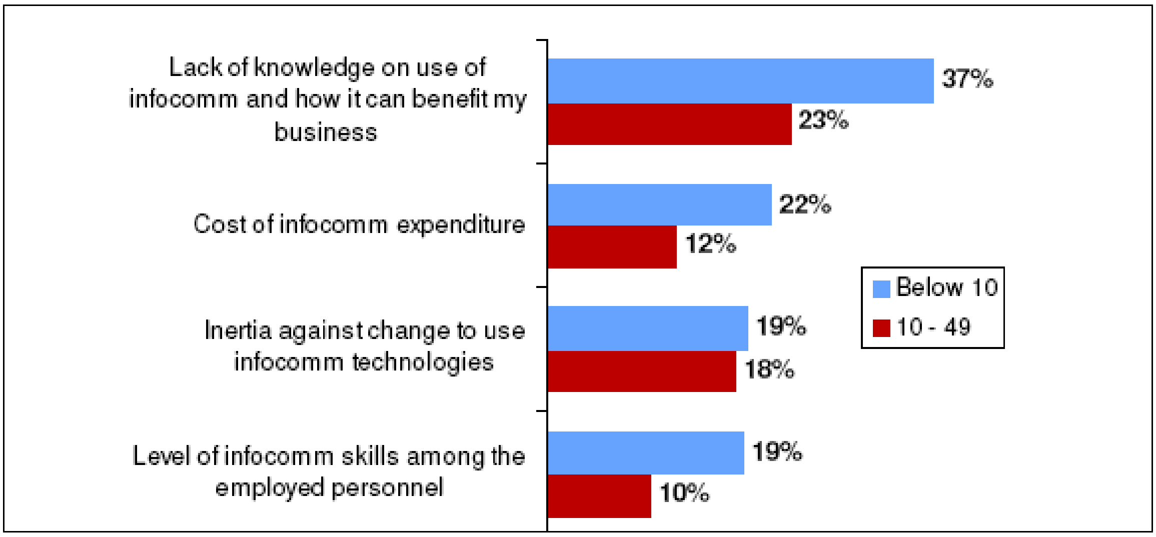
9 Annual Survey on ICT Usage by Businesses: This survey aims to determine the level of ICT adoption and usage by businesses in Singapore. The 2006 survey findings showed that while ICT adoption is prevalent among large companies, there is room for growth by the smaller companies (Chart 3).

Chart 3: Broadband access and web presence among businesses



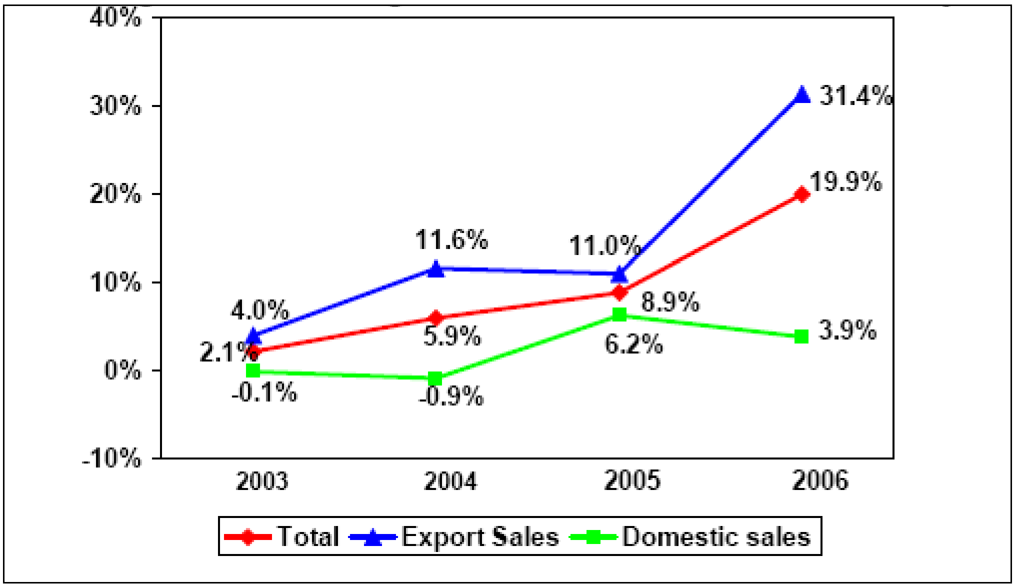
10 To raise ICT adoption, the Infocomm@SME programme was launched, with the target to have 80% of SMEs use broadband and develop a web presence by 2015. In June 2007, the first SME ICT Resource Centre was set-up to help train SMEs in the use of ICT. This took into consideration the survey findings that the main barrier to ICT usage was a lack of knowledge of ICT and how it could benefit the business (Chart 4).

Chart 4: Barriers to ICT Usage by Employment Size



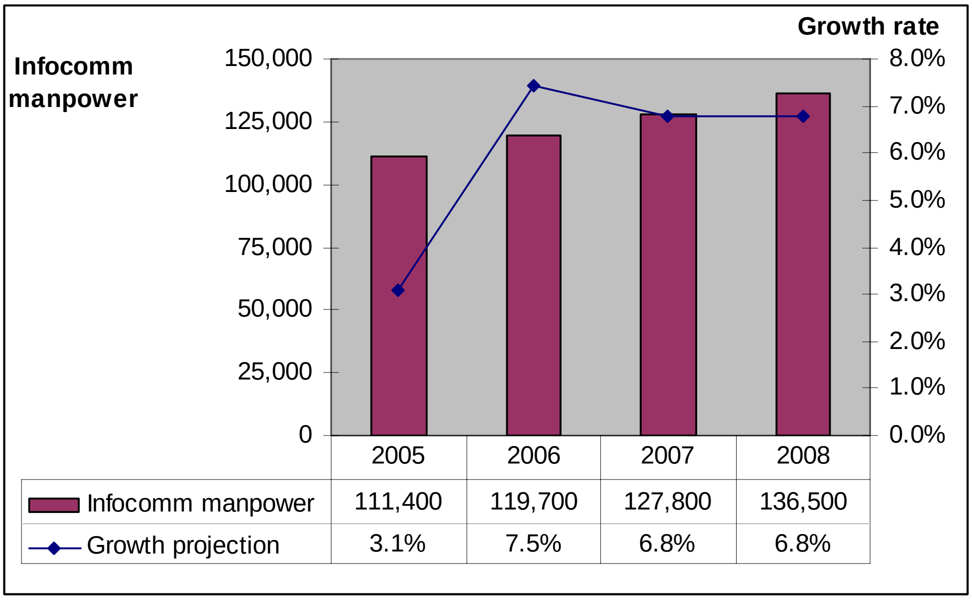
11 Annual Survey on ICT Industry: This survey aims to determine the market performance of the ICT industry in Singapore. In 2006, the total revenue of the infocomm industry registered a record growth of almost 20% to reach S$45.42 billion (Chart 5). Of this, the ICT export market saw a record growth of 31.4%, moving us closer to the iN2015 target of tripling Singapore's ICT export revenue to S$60 billion by 2015.

Chart 5: Revenue Growth of the Overall ICT Industry



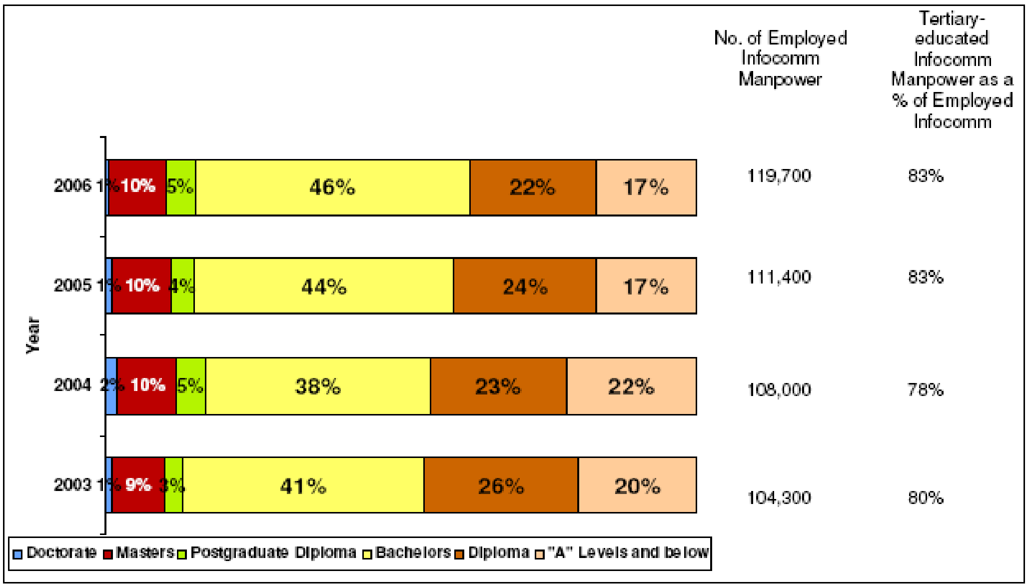
12 Annual Survey on ICT Manpower: This survey seeks to determine the profile of ICT manpower in Singapore. The survey findings provide an important information source in the formulation of strategies to develop an ICT-savvy workforce and globally competitive ICT manpower, one of the key thrusts under iN2015. The 2006 survey findings showed that ICT manpower grew by 7.5% to reach 119,700 (Chart 6). This is significantly higher than the average growth of 2.2% from 2002 to 2005, a reflection of the overall strong performance of Singapore's ICT industry in 2006.

Chart 6: ICT Manpower Growth



13 The 2006 ICT manpower survey also showed that there is an increase in the proportion of ICT workers with tertiary education (Chart 7). This is an encouraging trend, as it reflects a good supply of qualified manpower pool for companies in Singapore.

Chart 7: ICT Manpower by Highest Qualification (2003-2006)



Administrative Data

14 The other main mode of data collection is through the monthly submission of information by IDA-licensed telecommunication operators. The main objectives of this exercise are to obtain data for IDA to:

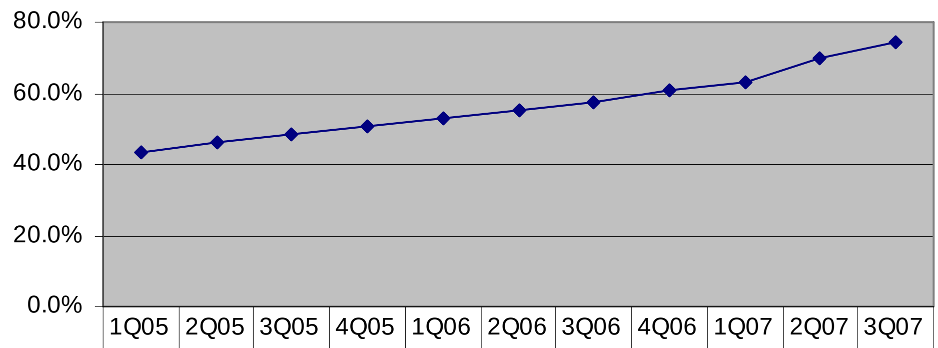
a. Monitor and analyse trends and development in Singapore's ICT landscape;

b. Formulate and review policies by relevant government agencies; and

c. Raise industry awareness and general public understanding of the state of ICT development and trends.

15 Some of the indicators generated from the data collected include mobile and broadband penetration rates. Information on the number of 2G and 3G subscriptions and number of DSL / Cable modem/ Leased lines broadband further provides insights into the technology adoption trends and how Singapore is progressing in terms of sophistication of use. Chart 9 shows that household broadband penetration in Singapore has been increasingly steadily since 2005. Broadband speeds are also increasing as operators compete to offer higher-speed packages or upgrade existing broadband plans (see Figure 3).

Chart 9: Household Broadband Penetration Rate



	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07
Household broadband penetration rate	43.5%	46.0%	48.2%	50.8%	52.8%	55.1%	57.3%	61.1%	63.3%	69.9%	74.4%

DATA DISSEMINATION

16 The key findings and management reports from the IDA surveys and telecommunication statistics are posted on the Facts and Figures page on IDA website: http://www.ida.gov.sg. IDA recently revamped this web page in August 2006 to give it a more user-friendly layout, making it more intuitive for users to locate the required statistics. We would welcome feedback on this exercise and suggestions for improvement.

CHALLENGES, ISSUES AND MITIGATING MEASURES ADOPTED

17 IDA seeks to review and improve on the surveys conducted and administrative data gathering process to ensure the continued relevance of the data collected and usefulness of the findings, bearing in mind the burden on the survey respondents and telecommunication licensees in providing the data. The following section shares the main challenges faced and our approach to mitigate to some extent these issues:

a. **Timeliness and Relevance**: Given the fast changing nature of the ICT sector, we regularly review the data collected to ensure that they stay relevant to the evolving ICT landscape. For surveys, we update our questionnaire each year, taking into account the model questionnaires by international organisations like the ITU, OECD, Eurostat. This is to ensure that we are aligned with their definitions and methodologies to facilitate international benchmarking. There is also close consultation with our licensees on proposed changes before implementation;

b. **Respondent Fatigue**: For surveys, one challenge we face is to manage respondent fatigue. To this end, we try to keep the questionnaire as concise as possible and complement with administrative data from other sources where possible; and

c. **Confidentiality**: Given the highly confidential nature of the data collected, in particular, where the data is deemed commercially sensitive, all information provided are treated with the strictest confidentiality. All information are aggregated and reported as a total figure and within IDA, there is a strict demarcation of responsibility and access to data. This helps to maintain a trusting and long-term relationship which is key for the process to work and be sustainable.

SUMMARY

18 ICT statistics and indicators serve as important inputs for reviewing and refining the strategies for Singapore's ICT progress and development. The process and data collected will be refined regularly to ensure that the process is rigorous and the data collected meaningful and useful to support analysis, review and policy-formulation. The sharing and dissemination of indicators is also important so that there is buy-in and clarity on the state of ICT and its role in the overall socio-economic development of Singapore.

ANNEX A: STATE OF SINGAPORE'S ICT LANDSCAPE

Table 1: Overview

<table>
<tr><th>Category</th><th>Indicators</th><th>Status</th></tr>
<tr><td colspan="3">A) ICT Sector</td></tr>
<tr><td rowspan="2">1) ICT Revenue[6], 2006 (S$b)</td><td>• Total Revenue
• Domestic Revenue
• Export Revenues</td><td>45.42
16.44 (36%)
28.98 (64%)</td></tr>
<tr><td colspan="2">• Note:
o Total revenue increased for the 6th consecutive year.
o The ICT revenue increased by 19.9% from 2005 to 2006, the highest since 2001.</td></tr>
<tr><td>2) ICT Value-Added, 2006</td><td>• ICT Value-Added Contribution to GDP</td><td>6.9%</td></tr>
<tr><td rowspan="2">3) ICT Manpower, 2006</td><td>• Total ICT manpower
• Total ICT job vacancies
• % with tertiary[7] qualifications
• ICT Manpower in ICT Organisations
• ICT Manpower in End-User Organisations</td><td>119,700
2,100
83%
60,700
59,000</td></tr>
<tr><td colspan="2">• Note:
o ICT manpower grew by 7.5% in 2006, continuing the rising trend for the 5th consecutive year.</td></tr>
<tr><td>4) Research & Development (R&D)</td><td colspan="2">• As part of Singapore's S$13.5b national Science & Technology 2010 Plan, the National Research Foundation intends to pump in S$5b into R&D over the five years from 2006, with S$2b earmarked for two areas, including Interactive and Digital Media.
• S$5m has also been set aside from Spring Singapore's Technology Innovation Programme (TIP) to help SMEs grow their businesses using ICT via sectoral tranformation.</td></tr>
<tr><td colspan="3">B) Business Environment</td></tr>
<tr><td>5) International Accolades</td><td>• World Bank Doing Business Report 2008
• Accenture Leadership in Customer Service Report, 2007 ("e-Gov")
• IMD World Competitiveness Yearbook, 2007
• WEF Global IT Report, 2007-2008
• EIU e-Readiness Report, 2007
• WEF Global Competitiveness Report, 2007-2008</td><td>1st
1st
2nd
3rd
6th
7th</td></tr>
</table>

[6] Revenue of the ICT sector is defined as Export sales and End-User sales in Singapore i.e. revenue excludes OEM/Other Resellers' sales. Domestic revenue is defined by End-User sales in Singapore and export revenue is defined by Export sales.

[7] Tertiary educated persons include diploma and degree holders.

C) ICT Adoption		
6) Telecommunication & Internet	• Fixed Lines Household Penetration, Sep 2007 • Mobile Phone Penetration, Sep 2007 • Home Broadband Penetration, Sep 2007 • Home Internet Access, 2006 • Home Computer Access, 2006 • Business Broadband[8], 2006 • No. of Wireless Hotspots in public areas • No. of subscribers to the wireless hotspots	95.2% 112.8% 74.4% 71% 78% 72% 5,600 522,000
	• Note: o As at Sep 2007, there are 1.4 m 3G subscribers (or 27.3% of total mobile subscriber base). o Since the launch of the Wireless@SG programme in Dec 06, more than 5,000 hotspots have been deployed island-wide and attracted more than 522,000 subscribers.	

[8] For businesses with 10 or more employees.