Information Infrastructure in Asia
Trends and Challenges

Mrs Tan Ching Yee
CEO, IDA
OECD-IPS Workshop, 21-22 Nov 2002
Information Infrastructure Development: A Schematic View

INFORMATION INFRASTRUCTURE

CREATIVE Infrastructure

CONTENT PRODUCTION
[Software development, games, media content etc]

SOPHISTICATED USAGE
[Consumer markets, industry clusters etc]

COMMUNICATIONS Infrastructure

ENCODING & STORAGE
[Digital processing, secure servers etc]

DISTRIBUTION & NETWORKING
[Fixed, wireless, cable TV, broadcasters etc]
Fixed and Mobile Subscribers in the Asia Pacific*

*Australia, China, Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan

New Investment as a Percentage of Revenue 1990 – 2000 (average)

New investment as % of revenue [1990-2000]

Mature markets
Leverage off mature infrastructure, rollout of advanced networks

Growth markets
Close access gap + rollout of advanced networks

International Bandwidth Connectivity

IP Connectivity (Mbps ‘000)

<table>
<thead>
<tr>
<th>Country</th>
<th>IP Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>JP</td>
<td>22.7</td>
</tr>
<tr>
<td>HK</td>
<td>7.2</td>
</tr>
<tr>
<td>AU</td>
<td>7.0</td>
</tr>
<tr>
<td>KR</td>
<td>5.4</td>
</tr>
<tr>
<td>TW</td>
<td>5.4</td>
</tr>
<tr>
<td>CN</td>
<td>3.3</td>
</tr>
<tr>
<td>SG</td>
<td>2.6</td>
</tr>
<tr>
<td>MY</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Bandwidth per capita (bps)

<table>
<thead>
<tr>
<th>Country</th>
<th>Bandwidth per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>HK</td>
<td>1008</td>
</tr>
<tr>
<td>SG</td>
<td>766</td>
</tr>
<tr>
<td>AU</td>
<td>364</td>
</tr>
<tr>
<td>TW</td>
<td>243</td>
</tr>
<tr>
<td>JP</td>
<td>179</td>
</tr>
<tr>
<td>KR</td>
<td>115</td>
</tr>
<tr>
<td>MY</td>
<td>32</td>
</tr>
<tr>
<td>CN</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Source: Telegeography, Packet Geography 2002
Telecommunications Spend as a Percentage of GDP (average 1990 – 2000)

Source: Credit Suisse First Boston, June 2002
### Trends in liberalisation: foreign ownership

<table>
<thead>
<tr>
<th>Country</th>
<th>Incumbent limits</th>
<th>New entrant limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>35% of Telstra</td>
<td>No limitation</td>
</tr>
<tr>
<td>China</td>
<td>0% on fixed, 25% on mobile and 30% on VAS providers on accession to WTO</td>
<td>No limitation</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>No limitation on PCCW</td>
<td>No limitation</td>
</tr>
<tr>
<td>Japan</td>
<td>33% of NTT holding company</td>
<td>No limitation</td>
</tr>
<tr>
<td>Korea</td>
<td>20% on Korea Telecom</td>
<td>33%</td>
</tr>
<tr>
<td>Singapore</td>
<td>No limitation on SingTel (15% limit on individual foreign holdings)</td>
<td>No limitation</td>
</tr>
<tr>
<td>Taiwan</td>
<td>20% limit on direct foreign ownership of local carriers</td>
<td></td>
</tr>
</tbody>
</table>

Source: IDA analysis of industry sources, 2002
Benefits of Liberalisation: Declining International Call Costs

Cost of 1 minute call to US (S$)

- IDD rates dropped by as much as 60%; and
- Innovative services e.g. Callback, VoIP, rates dropped by as much as 80%
Role of Government in the Infocomm Sector

Government effectiveness in promoting ICT

All governments in Asia are outperforming global averages for the public sector’s role in developing their infocomm sectors. Singapore, Taiwan and Hong Kong have emerged as global benchmarks.

Asia has a Leading Role in the Globalised Infocomm Sector

**COMMUNICATIONS Infrastructure**

**Wireless**
- **China** largest mobile network in the world: 145m subscribers [ITU, Mobile Internet, 2002]
- **Taiwan** highest mobile penetration in the world: 100+ subscribers per 100 population [Chunghwa Telecom, 2002]

**Broadband**
- **Korea** leading broadband market in the world: 53% penetration of households [KT Corporation, 2002]

**CREATIVE Infrastructure**

**Wireless data**
- **Japan** leading business model with NTT DoCoMo’s i-Mode

**E-Government**
- **Singapore** globally benchmarked provider of e-Government services: [Accenture survey, 2002]

**Legislation**
- **Malaysia** world first ‘convergence’ Act: India + Philippines draft Bills [Comms and Multimedia Act 1998]

**Laws**
- **Australia** has the most conducive legal environment for Internet activity [EIU e-Commerce Survey, 2002]
Measuring Asia’s Creative Infrastructure

Researchers per million pop

Undergoing transition from investment-driven to an innovation-driven economy

US: Global Leader
308 US Utility Patents per million pop

Japan

US Utility Patents per million pop

Fundamental Issues and Challenges for Asia

**CREATIVE Infrastructure**

- World’s best practice intellectual property and copyright environment
- Clustering of industry capability (multi-disciplinary teams)
- Easy access to regional markets as well as global distribution channels
- A ‘food chain’ for developing and nurturing skills and talent
- Finance for content developers

**COMMUNICATIONS Infrastructure**

- Location of international publishing and distribution capability in Asia (inc online billing and customer mgt systems)
- Low cost consumer access to both fixed and wireless bandwidth
- International least cost for online access to Asian servers and publishing nodes (importing consumers)
- G-to-G action to remove bottlenecks restricting commercial activity in areas such as cross border e-commerce
Thank You

www.ida.gov.sg
Various Growth Models

- Malaysia
- Philippines
- Japan
- Korea
- China
- Australia
- India
- Hong Kong
- Singapore

**Source:** Singapore IT Federation, February 2002

**IT development zones**

- Advanced networks
- Basic Access

**Investment focus**

- Facilitating
- Substantial
- Instrumental

**Government involvement**

- Size of national ICT spend
Benefits of Liberalisation

IDD rates have dropped by an average of 60% since full liberalisation. Tariffs for alternative international services – such as callback and VoIP – have also fallen by as much as 80% over the same period.

Per minute cost for IDD call [S$]

- Before full liberalisation [21-03 '00]
- After full liberalisation [current]

Benefits to Consumers: drop in Singapore’s IDD rates

Source: IDA Singapore analysis, 2002
Benefits of Liberalisation

- 15 facilities-based licensees pre-liberalisation vs. 33 facilities-based licensees as of August 2002

- Net increase of about 90 services-based licensees to 621 as of August 2002

- Drop in prices of services e.g. up to 80% for international calls, up to 65% for international leased circuits and up to 35% for local leased circuits

- Minimum capital investment of S$2 billion over 5 years since April 2000
# National Initiatives

<table>
<thead>
<tr>
<th>Country</th>
<th>Key initiatives</th>
<th>Approximate value of current Infocomm programme [USD m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia*</td>
<td>ICT Centre of Excellence</td>
<td>140</td>
</tr>
<tr>
<td>China</td>
<td>Electronic IT Sector Five Year Plan [2001 to 2005]</td>
<td>48,000</td>
</tr>
<tr>
<td>India</td>
<td>Bangalore IT Industry Park</td>
<td>Unknown</td>
</tr>
<tr>
<td>Japan</td>
<td>e-Japan Strategy</td>
<td>400</td>
</tr>
<tr>
<td>Korea</td>
<td>Cyber Korea [ubiquitous national fibre infrastructure by 2010]</td>
<td>24,600</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Extension of Multimedia Super Corridor [into Kedah, Johor and Klang Valley]</td>
<td>79</td>
</tr>
<tr>
<td>Singapore</td>
<td>Infocomm 21 [2001 to 2005]</td>
<td>280</td>
</tr>
</tbody>
</table>

*Note: Does not take into account additional State Government initiatives

Source: Strategic Intelligence analysis of Government Statistics, February 2002
Intra-Asia Connectivity

Intra-Asian connectivity is growing at twice the pace of the trans-Pacific Internet, reflecting growing e-commerce relationships and corporate networking within the region.

<table>
<thead>
<tr>
<th>Bandwidth capacity</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-regional</td>
<td>6.6%</td>
<td>13.1%</td>
<td>18.3%</td>
</tr>
<tr>
<td>Inter-regional</td>
<td>93.4%</td>
<td>86.9%</td>
<td>81.7%</td>
</tr>
</tbody>
</table>

Source: Telegeography, Packet Geography 2002
Conclusion

- Infocomm remains as critical economic growth component in Asia
- Key source of competitive advantage in knowledge based economy
- Increase connectivity and business flows across Asia to create benefits for all

Connect & Collaborate!