


*Development, Policies & Opportunities in*  
**The Emerging Digital  
Economies of Asia**

**The Transformation of Research & Development  
in East Asia and Japan Seminar Series**

US-Japan Technology Management Center  
School of Engineering, Stanford University  
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# Why Focus R&D in Electronic Commerce Technologies?

# 1998 US Dept of Commerce report

- How long to reach 50 mil users?
  - Radio in 38 years;
  - TV in 13 years;
  - Internet by 4 years
- [1994 -3mil users] - [1997-100mil users]
- Traffic X2 every 100 days
- Domain names  
[26,000 - Jul 1993] - [1.3 mil - Jul 1997]

# Internet Commerce in **Asia Pacific**

(from Asia/Pacific Internet – Market Forecast for Internet Commerce, 1996 – 2001 by IDC in 1996)

	<u>1998</u>	<u>2001</u>
Total WWW users (million)	6.86	23.31
Total WWW buyers (million)	1.18	6.83
Overall e-commerce per year (US\$m)	700.42	16,538.18

# What is this presentation about?

## Part I -

Competitive Strengths of Asia Pacific Digital Economies

## Part II -

Transformation of Singapore's R&D landscape

## Part III -

High Tech R&D and Business Opportunities in Singapore



# Part I

# The Emerging Asia Pacific Digital Economies

- Malaysia
- Japan
- Australia
- Singapore

# What do we look at?

1. General political, current events & policies
2. Competitive Factors
  - Labour
  - Technology Infrastructure
  - Sources of Capital
  - Taxes
  - Markets





# Malaysia

# Malaysia - generally

- Recovering from “Asian Flu” and other events
- Ambitious “Vision 2020” masterplan - to become a fully-developed, matured and knowledge-rich society
- Has a much publicised national plan for IT & E-Commerce Hub
- Low cost and good quality of life
- Multimedia Super Corridor (MSC) being constructed

# What is the 'MSC'?

- Area - 15km by 50km, encompassing the Kuala Lumpur City, Putrajaya and Cyberjaya
- Putrajaya - new electronic government capital
- Cyberjaya - the "intelligent city" of intelligent buildings for multimedia industries and R&D centres
- 2.5-10 gigabyte fiber-optic network being built into the MSC

# MSC Bill of Guarantee

2. Allow **unrestricted employment** of local and foreign knowledge workers.
3. Ensure **freedom of ownership** by exempting companies with MSC Status from local ownership requirements.
7. Ensure **no Internet censorship**.
9. **Tender** MSC infrastructure contracts to companies willing to use the MSC as their regional hub.

# D-Economy Competitive Factors

- Labour

- Large labour force BUT also need large amount of IT professionals by 2000
- Multimedia University in Cyberjaya
  - started its operations in Cyberjaya in May 1999 with an initial intake of about 3000 students.
  - Multimedia University to provide R&D facilities
- unrestricted work permit policies for foreign knowledge workers

- Infrastructure

- Telecommunications backbone for 2.5 - 10 Gbps
- One-stop client centre that will expedite visas and other licences and permits

# D-Economy Competitive Factors

- Sources of Capital
  - Malaysian Exchange of Securities Dealing and Automated Quotation (MESDAQ)
- Tax Framework
  - 0 % income tax for up to 10 years in MSC or
  - 100% investment tax allowance
  - No duties on multimedia equipment
- Markets
  - Small consumer market with relatively low IT skills



Japan

# Japan - generally

- Economic powerhouse (?)
- Good IT infrastructure
- Government also recognises the importance of EC and raising investment
- Top NII in Region
- High Cost of Living & High Pressure culture



# Japan High Tech R&D

Push for Research and development of the  
“Next Generation Internet”

- Ultra high-speed data transmission
- Secure and reliable transmission of electronic money data
- Digital watermarks for protection of IPRs
- Improved reliability of the Internet in general
- Authentication of web sites

<http://www.mpt.go.jp/whatsnew/CyberBusiness.html>

# D-Economy Competitive Factors

- Labour
  - availability of highly specialised pools of labour
- Technology
  - world leader in application of technology and electronic consumer products R&D
  - some companies already have a ten-year history with smart cards
- Infrastructure
  - Japanese national backbone running at the same speed as the U.S. backbone.
  - Fastest international line ever on the Internet at that time at 45Mbps

# D-Economy Competitive Factors

- Sources of Capital
  - depressed markets dampen interest in WWW
  - 9.6 billion yen from govt. to provide interest free loans for small businesses.
- Tax Framework
  - relief to help stimulate capital investment for companies and in communications.



Australia

# Australia

- A developed nation - serious contender after Japan for top in EC in the region
- Stable economy - growth even in the Asian financial crisis
- A major content producer as well as innovative IT solutions
- High Quality of Life

# Australian projects

- Intends to be the EC hub of Asia Pacific
- Prime mover to standardise efforts, echnology and regulation for APEC E-Commerce
- Developing high bandwidth connection with rest of Asia
- Deregulated telecommunications industry

# D-Economy Competitive Factors

- Labour
  - highly educated workforce
  - English language
  - augmented by multilingual diversity
  - Culture of creativity promotes entrepreneurial activities needed for electronic commerce
- Technology
  - SME delayed the adoption of new technology because they do not see immediate benefits.
  - Bigger corporations also view the technology as unreliable.

# D-Economy Competitive Factors

- Infrastructure
  - excellent infrastructure, competitive skills of its workforce and low cost of operations
  - Optus - high-speed high bandwidth (155Mbps) access
- Sources of Capital
  - Venture funds and capital funds are not centrally available
  - State of Victoria highly motivated in EC R&D



# D-Economy Competitive Factors

- Tax Framework
  - Currently no tax breaks available for investors
- Markets
  - sophisticated consumer market
  - The domestic market is huge and well connected
  - English educated



Singapore

# Singapore

- Stable financially and politically in a turbulent region
- NII in place - 'Singapore ONE'
- Government investing heavily in EC
- Population has high IT literacy
- Widespread application of information technologies in homes, businesses & schools

# D-Economy Competitive Factors

- Labour
  - Currently available large pool of IT knowledge workers but still insufficient to meet demand
  - Multiracial, Multilingual population
  - National programme to train up to 250k workers to be IT literate in 5 years on track
- Technology
  - Multiple uses for Smart cards - e.g. Electronic Road Pricing
  - 10,000 smart card readers distributed for EC transactions using 128 bit encryption technology
  - Homes and Offices are already wired for speed

# D-Economy Competitive Factors

- Infrastructure
  - 36% (1 in 3) of Singapore household own computers but only 14% of the population own email accounts
  - Singapore ONE - Multimedia content & services
  - Fast broadband home access to the Web via Cable Modem (10 Mbps) & ADSL (5.5 Mbps)

# D-Economy Competitive Factors

- Available infrastructure services
  - Online Secure Payment - SET; Cashcard (C-ONE)
  - Directory Services
    - National Contact Information System,
    - Business Information Locator
    - Calendar ONE & Shopping Village
  - Electronic Identification - Infrastructure for Electronic Identification (IEI) Project using Digital Signatures (ongoing)

# D-Economy Competitive Factors

- Infrastructure (Continued)
  - New Finance & Venture Capital
  - Legal and Policy Framework for EC
    - Electronic Transaction Act 1998
    - Electronic Transactions (Certification Authority) Regulations 1999
  - Nation wide EC Applications

CPF Online; URA; SNS Tradenet; NCS  
Selfserve; AsiaOne; Sistic; POSB Internet  
Banking etc

# D-Economy Competitive Factors

- Tax Framework
  - 10 year Pioneer Status Investment Allowance
  - Approved Cyber Trader scheme
- Markets
  - Singapore currently has an estimated 400k Internet accounts - 1.5 million users by 2001
  - BUT small population= small consumer market (?)
  - reluctant tendency to shop online as shopping is a way of life in Singapore





Source: NCB Business-to-business E-Commerce Survey 1999

# Part II

## *Transformation of Singapore's R&D landscape*

# The questions...

- Where is mainstream high technology R&D going and why?
- How has it changed the R&D landscape?
- Singapore Model for R&D:  
(High Tech Entrepreneurship = Technopreneurship)

*“... challenge for the Singapore economy in the 21st century was to rapidly transit from a capital-intensive manufacturing and services economy to a globally competitive advanced **knowledge economy** with a strong and **vibrant technopreneurship** sector within the next decade.”*

DPM Dr Tony Tan



*What is Singapore's new  
Strategic plan?*

# "Technopreneurship 21"

1. **New Funds** - US \$1 billion - seed money for developing Singapore into a venture capital centre
2. **Education** - to build a risk-taking mind set
3. **Facilities** - build comfortable, attractive, safe and conducive facilities to attract talent
4. **Deregulate & Laws changed** - to support the entrepreneurial environment.

The background is a dark teal color with a large, lighter teal geometric shape that resembles a stylized 'V' or a diamond shape pointing downwards. On the left side, there is a vertical bar divided into two sections: the top section is light orange and the bottom section is dark red. The text '1. Funding' is centered in the upper half of the page.

# 1. Funding

# Sources of Capital & Funding

- EDB - Economic Development Board
- GIC - Government Investment Corp
- NSTB - National Science & Technology Board
- NCB - National Computer Board



# Singapore's US\$1b technology fund

- National Science and Technology Board (NSTB) will manage US\$250 million to co-invest with the private sector to develop Singapore-based startups with ideas at seed-stage.
- Government of Singapore Investment Corporation (GIC) will manage the remaining US\$750 million through two funds
  - US\$500 million broad-based Fund of Funds
  - US\$250 million Strategic Fund.

# NSTB Funds

- Business Angel Fund
- Technology Incubator Program
- Technology Development Fund
- Patent Application Fund (PAF)
- Research and Development Assistance Scheme (RDAS)
- Innovator Assistance Scheme
- Incubation Support (Innovation Centre)
- Technopreneur Assistance Centre

# NCB

- IT Cluster Development Fund
- Local Enterprise Electronic Commerce Programme
- IT Co-Investment Fund (ITCF)
- Broadband R&D Grant
- Business Headquarters Program
- Initiatives in New Technology Scheme
- Pioneer Status Investment Allowance

# Other Resources

- National Patent Information Centre
- National Technology Databank
- People Networking
  - Innovators Club
  - Technology Networking Group
  - Mentoring Programme



## 2. Education

# Review of Education

- Universities to be more independent
  - in managing its funds
  - staff recruitment and
  - governance structure
- Undergraduate & Postgraduate programmes and Forums in Technopreneurship at both Universities

Centre for Management of Innovation & Technopreneurship - Netscape

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CMIT



# Centre for Management of Innovation & Technopreneurship

 **New!**

Last Modified: 29 September 1999

## Our Mission

To foster technopreneurial venture creation and promote excellence in the management of technological innovation in Singapore and the Asia-Pacific region through research, education, partnership with industry/government and international collaboration.

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## School of Mechanical and Production Engineering

Introduce students to essential business skills and to provide them with a road-map on the high tech entrepreneurial process.

### SCOPE:

- (1) Starting and running a business modules
- (2) Enrichment modules on business skills and strategy
- (3) Visits to companies
- (4) Project with emphasis on technology, business survey and planning



**SIFT - Netscape**  
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# Students' Initiative For Technopreneurship

SIFT | What's New | Network | Discussion | Resources | About Us | SiteMap

## Coming Soon... C2K

September 24, 1999

[SIFT Recruitment](#)      *Last updated on 30/8/99*

[Calendar](#)

[Book of the Month](#)

### Members login

Login:   
Password:

Community strength : **913**

### What's New

#### Technopreneur Schemes

A fun yet in-depth look into the recent schemes by the government.

#### Site Tracker

Seeing the same old thing everytime? Be alerted through your email everytime SIFT changes! It's right below!

---

### Resources

#### Starting your start-up in Singapore

by Rajah & Tann, our corporate partner.

#### Protecting your intellectual property

by Rajah & Tann, our corporate partner.

#### Like or Dislike

Have a say in what kind of resources you want. Cast your vote now! Your vote is sacred! (Found at

Document: Done



# 3. New Facilities



# Singapore Science Park I & II

# New Buona Vista Science Hub

- Being built at cost of \$5 billion, where ideas born within a scientific community are cradled, nurtured and developed into commercial ventures.
- 176 ha of the Buona Vista area, (three times the size of the present two Science Parks)
- Next to National University of Singapore,
- INSEAD and Johns Hopkins University will establish a presence there



# 4. Deregulation & Changing of Laws

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**South China Morning Post**  
**TECHNOLOGY**

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Published on Wednesday, September 15, 1999

**BUSINESS**

## Singapore opens ISP market to overseas players

**NEWSBYTES**

Singapore is hoping to attract new players to compete in the local Internet service provider (ISP) market with the dropping of a 49 per cent foreign investment limit for new ISP licensees.

Foreign companies will no longer have to venture into the market with local partners - a restriction that was preventing overseas companies from applying.

Direct and indirect foreign equity limits have been lifted with immediate effect.

The Telecommunications Authority of Singapore (TAS) said that further liberalising the market would bring

**Resources:**

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# Laws Changed

- Easier for foreigners to set up businesses in Singapore - e.g. long term visas without employment
- Bankruptcy Laws:
  - Minimum threshold for filing bankruptcy increased from S\$2,000 to S\$10,000
  - Debts of under \$500k can be discharged lowered to 3 years (from 5 years)
- Employee can defer tax liabilities for 5 years when exercising their stock option rights
- Investors may qualify for tax deduction for investing in failed start-ups

# Public Housing Regulations

- Amended Housing Regulations
- Permit HDB property owners to:
  - Use their homes as their registered place of business
  - As a 'garage' to develop their products
- Subject to minor conditions



# Public & Statutory Board Practices

- Standard minimum requirements for public tenders and contracts lowered to allow new start-ups to bid

# Part III

## High Tech R&D and Business Opportunities in Asia

# R&D Opportunities

Technology in demand now -

- Language translation technologies for US content into regional languages
- Business uses for high speed connections in Singapore
- Developing technologies for delivery of online education and services to rest of Asia

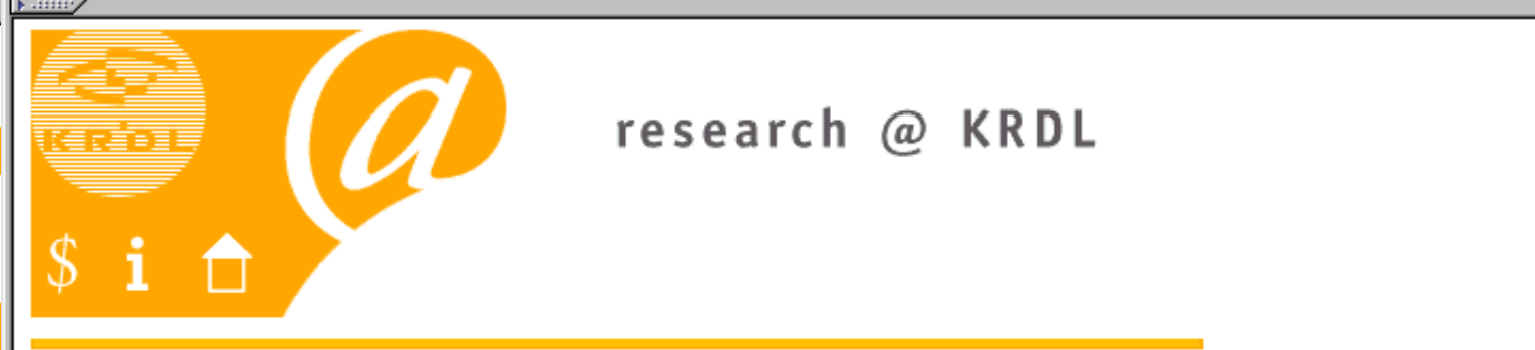


Updated on Tuesday

Hot News! Septem Click: N MT S



Find out about our Partners and Start-ups, Hi-tech Investment Opportunities and Hot



# TECHNOLOGY focus LABS

- ▶ Knowledge
- ▶ Bioinformatics
- ▶ Learning
- ▶ Ubiquity
- ▶ Medical Imaging
- ▶ Transportation

- ▶ KRDL On-line Publication
- ▶ Conferences and events
- ▶ Current Projects
- ▶ Our People
- ▶ Job Offers

# Business Opportunities

## Businesses -

- Asian Content services
- Super intermediary services for Asian retailers in US
- Supply chain solutions for SMEs
- Logistics & Distribution Centre in US for Asian businesses - and in Asia for US businesses
- Innovative Culture-centric Marketing
- World Class Asian Portal Sites - e.g. CNET Asia

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## *Incentive schemes*

NCB is providing incentive schemes to further entice content providers to join the Content Hosting Programme. These incentives are:

- *Quick Start Environment incentive* – Participants in the QSE will have their content hosted free for up to 6 months
- *Direct deployment incentive* – Service providers may apply to the NCB for financial incentives in the form of a subsidy of up to 70% (typically 50%) of the total development, set-up and operational cost for up to 2 years.
- *Double the bandwidth incentive* – Service providers with content hosted locally can apply to double the bandwidth should their existing bandwidth prove insufficient.

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# Do it (Singapore) have what it takes?

- Environmental factors
- Finance & Venture Capital
- Critical Mass of Innovators & Inventors
- Venture Capitalists and Start-up Managers

# Thank You

**Stanford University**  
**US-JAPAN TECHNOLOGY MANAGEMENT CENTER**

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- End of Presentation -



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