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IT Movement in Southeast Asia: Case of Singapore, Malaysia and Thailand

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1. INTRODUCTION

There is a myth that the development of Information Technology (IT) is equal to economic and social development today. Every government, especially in developing countries, realizes that the introduction and development of IT is essential for their development. Also, people are urged to keep up with the IT trend without understanding what it really means to them. Most people do not know much about IT but understand the fact that the IT revolution is an irreversible world trend and that IT is having a great impact on their lives. Diffusion of the Internet and other online services has created a new world without boundaries. We can access volumes of information and services from anywhere at any time. We take this new convenience for granted today.

In Southeast Asia, awareness of IT has been increasing over the past few years, especially at government level. (See Table 6.1) Following the 1997 economic crisis, commitment to IT has been consolidated further because IT is expected to lead to new economic growth. Even though government is not the only key player, its policies on information infra-structure, telecommunications sector, and education are central to the future information society. Today, the region is attracting Multinational

Table 6.1: Main National IT Policy in Southeast Asia

Country	Policy	Year
Singapore	IT2000	1992
	Singapore One	1996
	ICT 21 Masterplan	1999
Malaysia	Multimedia Super Corridor	1996
Thailand	IT2000	1995
	The Greater Phuket Digital Paradise Project	2000
Indonesia	Nusantara21	1997
Philippines	IT21	1997
Vietnam	IT2000	1995

Source: *Yomiuri Shimbun*, 23 September, 2000.

Corporations (MNCs) from all over the world as an emerging IT market. While there is an undeniable sense that the word 'IT' has wings, nonetheless it brings a new dynamism to the region.

Singapore has achieved the status as one of the most successful IT countries in the region, and even in the world. As you see in Table 6.2, Singapore is prominent in information infrastructures, and IT is spreading into every field of the society. Malaysia and Thailand are following next. The rest of the countries, Philippines, Indonesia, and Vietnam, are

Table 6.2: Diffusion Rates of Information Infrastructures (1999)

Country	Per 100 inhabitants Subscribers				GDP per capita (1998) US$
	Main Telephone Lines	Cellular Mobile Phones	Internet Users	PCs	
Singapore	48.20	41.88	29.45	52.72	21,413
Malaysia	20.30	13.70	6.87	6.87	3,333
Thailand	8.57	3.84	1.31	2.27	1,859
Indonesia	2.91	1.06	0.19	0.91	605
Philippines	3.88	3.66	0.67	1.69	898
Vietnam	2.68	0.42	0.12	0.89	335
Japan	55.7	44.94	14.46	28.69	30,105

Source: ITU Telecommunication Indicators,
http://www.itu.int/ti/industryoverview/index.htm.

still, however, at a very early stage.

The diffusion of IT has just started in the region, but there is an excessive expectation. Much attention has been focused on convenience, efficiency of government and business activity, technological innovation, and other positive aspects of IT in relevant literature. However, here I would like to raise the question from the perspective of the general public: whether national IT development meets with the needs/demands of the public, and whether they really exploit it or not.

The country mainly considered here is Singapore because of its leading role and advancement in IT. Its experience can be a model and give suggestions for other regional countries. I also briefly look at the cases of Malaysia and Thailand to examine their current situation and lessons from Singapore.

2. SINGAPORE

2.1. Background

Singapore has achieved rapid economic growth since its independence even though the domestic market has been constrained by its small population and land size.[1] Economic development can be partly attributed to efficient and pragmatic government providing an infrastructure base for MNCs to undertake manufacturing and service operations.[2]

In the early 1980s, the government began promoting an application of IT into its economic development. The policy makers saw IT as a key strategic factor in restructuring its economy from a manufacturing and service operation center to a higher value added economy. The overriding aim was to sophisticate industrial structure and keep its competitiveness in global markets.

2.2. IT Policy of Singapore

The spearhead of IT in Singapore was the establishment of the National Computer Board (NCB) in 1981 to implement a National Computerization Plan (NCP) issued a year before. Since then, NCB had been a center of IT development until the establishment of the Info-communication Development Authority (IDA) in 1999.

During this period, the government mainly focused on diffusion of computer technology and its exploitation. Under NCB initiative, a Civil

Service Computerization Program (CSCP) was implemented in 1981 to demonstrate the benefit of computerization by computerizing the activities of government institutions.

In 1986, NCB, cooperating with Singapore Telecom, the Economic Development Board, and the National University of Singapore, launched a National IT Plan (NITP). It was aimed at nurturing an export-oriented IT industry and increasing the productivity and competitiveness in all economic sectors by applying IT. The government shifted its focus to more integrated strategies among hardware manufacturing, telecommunications and software services, and manpower development.[3]

During this period, as an outcome of CSCP, online services, such as TradeNet, School Link, and LawNet,[4] were begun. The number of IT manpower increased from 850 to 14,300 in 1991. As for infrastructure, companies in Singapore were able to make direct international calls to more than 160 cities around the world using a 100 percent automated and touchtone phone. In 1989, optical fiber cable networks were laid. And Singapore became the first country in the world to offer nationwide commercial ISDN services.[5] Singapore had set a basic foundation in IT during the 1980s, which paved the way for the next stage.

In 1992, the NCB issued a Masterplan, IT2000: A Vision of an Intelligent Island, to transform the country into an intelligent island where IT is exploited to the fullest to enhance the quality of life at every place as well as economic activities.[6] The plan was based on recognition that Singapore needs to have a new information infrastructure to keep its competitiveness as a regional hub.

A key element was the construction of National Information Infrastructure (NII). In 1996, Singapore ONE (One Network for Everyone) was launched to build the world's first broadband multimedia networks and applications covering a whole country.[7] As of October 2000, Singapore ONE is accessible by more than 99 percent of homes, all schools, and a number of public facilities. There are 250,000 users with 300 application providers. Even people without computers can access at public kiosks located at places such as street corners and shopping malls.

IT2000 and Singapore ONE have laid a solid foundation. Today, Singapore is moving into a new stage with its ICT21 Masterplan. It is expected to lead Singapore into the Information Communication and Technology Hub of the new economy by the year 2010.

Details of the Masterplan were announced in 2000. (See Table 6.3) As a first step, the government completely liberalized the telecommuni-

cations market in April 2000, two years ahead of the originally scheduled year 2002. As of September, 140 companies were granted licenses. International call fee has already been reduced to half. The government had a sense of fear that they had to liberalize ahead of schedule in order to keep up with rapid technological innovation and to survive global competition.

Table 6.3: Key Component of ICT 21 Masterplan

1. (1) Full liberalization of the telecommunications industry
   - To be a leading info-communications hub in the Asia-Pacific, the telecommunications market must be liberalized while attracting new investments and players who bring innovative, high quality, and cost effective services.
   Policy: On April 1 2000, telecommunications sector in Singapore was fully liberalized ahead of originally scheduled on April 1, 2002.

   (2) Infocomm industry development
   - To double the size of the infocomm industry by 2005, especially to focus on new growth areas such as e-commerce application software and services, broadband applications, content hosting and development, mobile and wireless communications, mobile Internet services, and embedded software in information appliances and smart devices.
   Policy: (1) Jumpstarting the Interactive Broadband Multimedia (IBBMM) Industry.
   (2) Building new capabilities and leveraging on innovation for the new Internet economy.
   (3) Fostering strategic partnership and alliances overseas to help local companies regionalize and globalize.

2. Dot-com the people's sector
   - Income, language, and mindsets are three main causes of the digital divide and possible barriers to new entries. Even though the gap is narrowing today, the rapid pace of development and emerging new technologies may possibly leave them behind in the future.
   Policy: (1) Improve the affordability of PCs and accessibility to the Internet to low-income households.
   (2) Working with industry and community groups, IDA grows the locally relevant contents in other Asian language.
   (3) Implement e-Ambassadors program, whereby volunteers teach late adopters in the use of Infocomm appliances, to narrow the gap between them.

Table 6.3 (continued)

3. Developing Manpower
- Manpower shortage in the Infocomm sector is a problem in every country in the world. In 2010, Singapore will need 250,000 workers in the sector. In order to meet demand, Singapore must not only develop its own talent, but also prepare to accept international manpower.

Policy: (1) Cooperating with industry and the institutions of higher education, IDA provides the appropriate training to students and workers to nurture a net-savvy talent pool.
(2) Making policy to attract and retain international talent.
(3) Building up e-Learning and becoming its hub in the region.

4. Dot-com the public sector
- The public and business can reach, communicate and interact with the government virtually to obtain government information and utilize government services on the move.

Policy: (1) Pushing the envelop of electric service delivery
(2) Building new capability and new capacity.
(3) Innovating with Infocomm technologies
(4) Anticipating to be proactive, sensing to be responsive
(5) Developing thought leadership in e-Government.

5. Dot-com the private sector
- To enhance e-commerce by leveraging its strength in e-commerce infrastructure.

Policy: (1) Laying a robust foundation of e-Business
(2) Catalyzing the digital transaction
(3) Spurring consumer demand
(4) Branding Singapore as a trusted global "Dot.Com" Hub and an e-Business thought leadership center.
(5) Attracting top talents
(6) Fostering an e-Lifestyle and bridging the digital divide

Source: Infocomm 21 http://www.ida.gov.sg.

2.3. Given Factor

It has been 20 years since the government implemented IT policies. The government has gradually laid a solid basic foundation and adjusted its policy flexibly as required. Thereby Singapore eliminated a supply side bottleneck.[8] However, we should keep in mind that Singapore has advantageous given factors:

(1)   Singapore already achieved high GDP per capita so they are

capable of investing much funding into the project.
(2)   There exists an electronics industry cluster of MNCs.
(3)   Its small size and population are advantageous for penetration.
(4)   Strong and effective leadership can flexibly adjust the policy to the development.
(5)   There were basic social infrastructures.

Singapore has manipulated these given factors skillfully with IT policies. Today, IT is spreading into every field of the society and PCs and the Internet are widely diffused among the people. However, whether the people really share the fruit of IT is a different matter. Many challenges remain.

2.4. IT in Society

2.4.1. PCs and Internet

According to IT Household Survey 1999 conducted by NCB,[9] only 11 percent of households had PCs in 1987, and since then, the figure rose to 19 percent, 27 percent, and to 36 percent in 1990, 1993, and in 1996 respectively. Today, the PC penetration rate of Singapore households is 59 percent (See Figure 6.1), and 57 percent of Singaporeans have access to the Internet.[10]

Figure 6.1: Ownership of Computers in Singapore Households
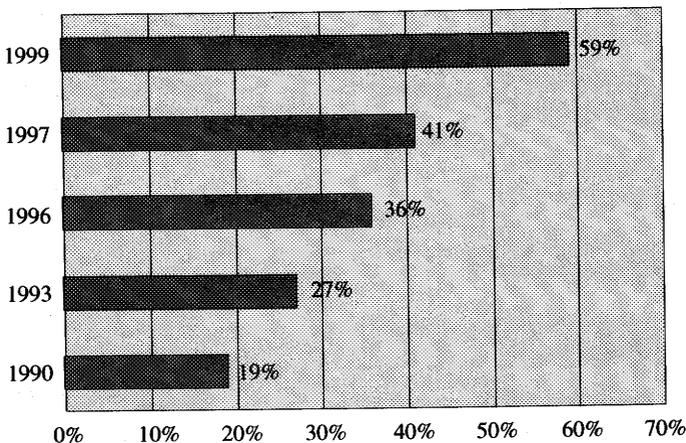
Source: IT Household Survey 1999.

The survey shows an interesting fact about PC penetration. There is a gap between private housing and public housing. Some 78 percent of private households have at least one computer compared to 55 percent of those in public housing. (See Figure 6.2) Within public housing, 78 percent of executive flats/maisonettes have PCs compared to 64 percent of 4-5 room flats and 41 percent of 1-3 room flats. (See Figure 6.3)

### Figure 6.2: PC and Internet Penetration Rates By Types of Housing
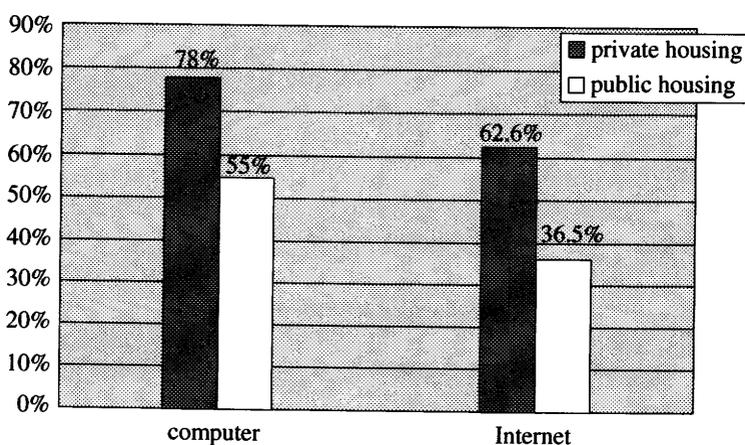
Source: IT Household Survey 1999

The same trend can apply to Internet access rate, 62.6 percent in private housing and 36.5 percent in public housing. (See Figure 6.2) Within public housing too, residents in executive flats have higher access rates than those in 1-3 rooms. (See Figure 6.4) Today, the GDP per capita of Singapore is about US$22,000. Also, NII is accessible to all households. Even so, the degree of IT penetration is affected by income differences.

2.4.2. IT Usage of the Public

High penetration rates of IT do not mean the usage is sophisticated. According to the survey, most of the users use PCs and Internet for e-mail, games and information retrieval. On the other hand, online banking, distance learning, online shopping, and online government services,

Figure 6.3: Ownership of Computers in Public Housing
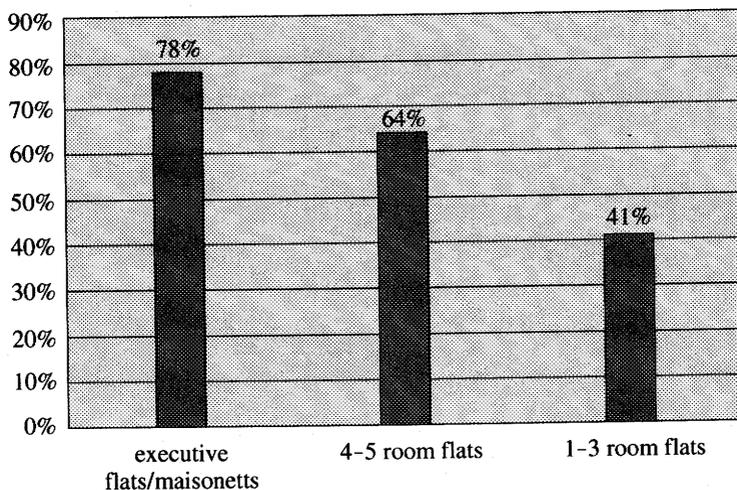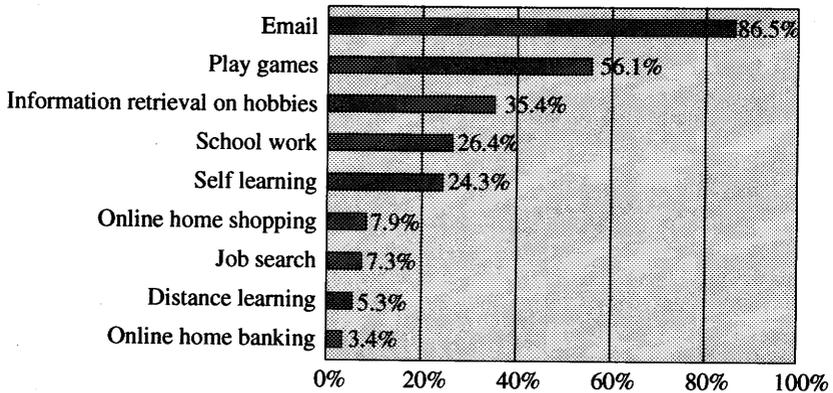

Source: **IT** Household Survey 1999.

Figure 6.4: Internet Access By Types of Public Housing
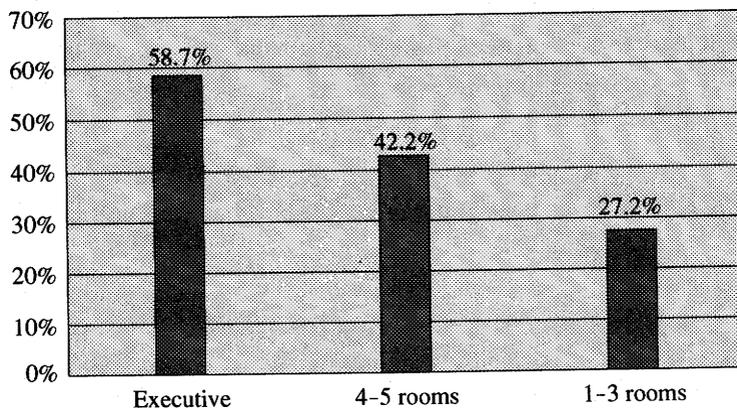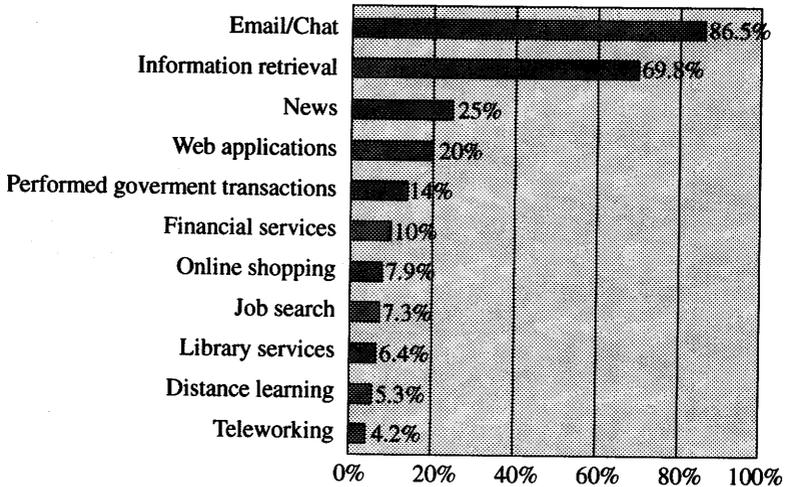

Source: **IT** Household Survey 1999

which are supposed to be the main expected usages in the IT era, are the least used. (See Figure 6.5 and 6.6)

Figure 6.5: Types of Computer Usage

Email — 86.5%
Play games — 56.1%
Information retrieval on hobbies — 35.4%
School work — 26.4%
Self learning — 24.3%
Online home shopping — 7.9%
Job search — 7.3%
Distance learning — 5.3%
Online home banking — 3.4%

Source: IT Household Survey 1999.

Figure 6.6: Types of Internet Usage

Email/Chat — 86.5%
Information retrieval — 69.8%
News — 25%
Web applications — 20%
Performed goverment transactions — 14%
Financial services — 10%
Online shopping — 7.9%
Job search — 7.3%
Library services — 6.4%
Distance learning — 5.3%
Teleworking — 4.2%

Source: IT Household Survey 1999.

At present, the Singapore government provides 130 kinds of online services, such as selling government publications, providing real-time traffic information, bookings for driver's test and submitting various application forms. However, only 21.5 percent of Internet users have

ever accessed online government transactions.

Figure 6.7 shows the types of online government transactions and Figure 6.8 shows the main reason for not accessing online government service. IT is expected to bring efficiency and benefits, but interestingly, many people still prefer to handle the process in the old fashioned way so that the new online services are not always meeting public demand.

Figure 6.7: Types of Online Government Transactions
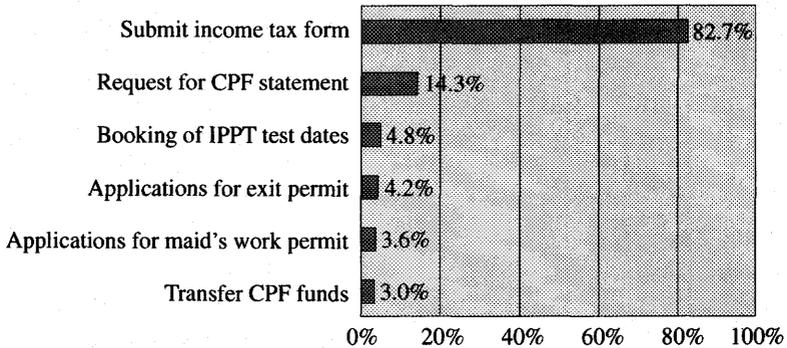
Source: The IT Household Survey 1999.

Figure 6.8: Main Reason For Not Accessing Online Government Transactions
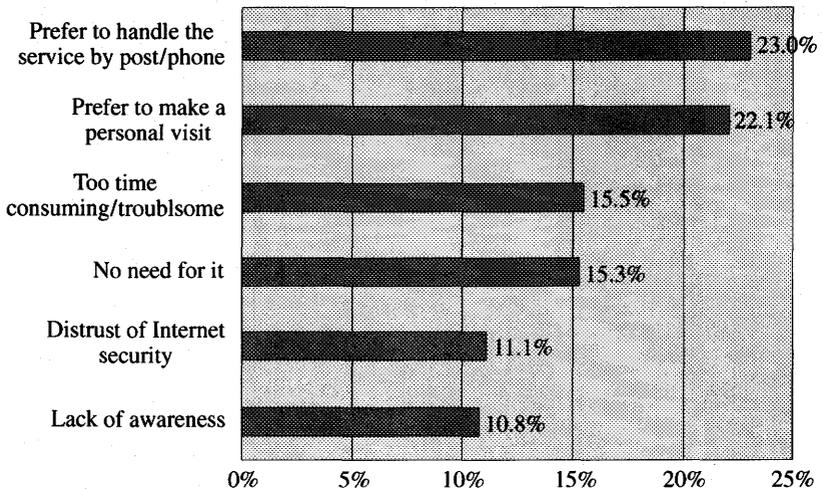
Source: The IT Household Survey 1999.

2.4.3. IT in Education

The introduction of computers into secondary schools was began in 1981, and the government launched Masterplan for IT in Education in 1997. Since then, computerization of all schools has been done gradually. At present, the curriculum for primary and secondary schools are 10 percent and 14 percent use of IT respectively. The ratio of student to computer is 5:1 in secondary school and 6:1 in primary school respectively. Also, all schools are connected to Singapore One and each school has at least two PCs connected to it.[11] What is significant is that after primary school, pupils have basic computer literacy. IT education at primary level expands IT literacy. It also reduces the divide between haves and have-nots. The government says that all school leavers will be IT literate by the year 2003.

2.5. The Gap Between Government and People

Judging from the supply side, Singaporeans are certainly enjoying the fruits of IT. There are information infrastructures accessible by all households, a variety of online services and applications, and higher IT education. From the demand side, it seems that the supply is not really meeting their needs yet. The survey shows that there is a certain gap between the government and society. A high diffusion rate is not always accompanied by sophisticated usage. Also, even in an egalitarian society like Singapore, we see the tendency that income affects the degree of IT diffusion. Therefore, it is interesting to note what Singapore experiences tell us. Even though the country has achieved an information society to a large extent, and that the government paid attention to both economic and social development from the beginning, and with IT education and literacy already extended to a certain degree, the fact remains that the sophistication of IT is centering on the supply side first, and the fruits of IT have not ripened yet among the public. Concern with the degree of development is more applicable to less IT developed countries.

3. MALAYSIA

3.1. National IT Policy: Multimedia Super Corridor

Prime Minister Dr. Mahathir Mohamad officially launched a national IT plan, Multimedia Super Corridor (MSC), in 1996. MSC is considered as a main vehicle to achieve Vision 2020.[12] The overriding object of MSC is to build the necessary environment for the new era and nurture knowledge-based industry in conjunction with the manufacturing sector by attracting both multinationals and domestic world-class players. The whole plan is divided into three phases:[13]

Phase 1: 1996-2003. (1) Establish Cyberjaya and Putrajaya as world-class intelligent cities.
(2) Establish Cyberlaws
(3) Launch seven Flagship Applications
(4) Attract 50 world-class companies

Phase 2: 2004-2010. (1) Establish more intelligent cities
(2) Link the MSC to other cities and the world
(3) Establish a cluster of 250 world-class companies

Phase 3: 2011-2020. (1) Establish more intelligent cities
(2) Transform Malaysia into a knowledge-based society
(3) Establish a cluster of 500 world-class companies

Malaysia has approximately 22 million people and is 330,000 km² in size so that it is unrealistic to built a nationwide information infrastructure as fast as that of Singapore. A specific feature of MSC is that the government decided to develop certain areas as a concentration of IT infrastructure and industries. The corridor configures 15km-wide and 50km-long starting from Kuala Lumpur City Center (KLCC) to Kuala Lumpur International Airport (KLIA). In the corridor, two of the world's first smart cities, Cyberjaya and Putrajaya, are being developed.[14]

As for soft infrastructures, the government enacted 6 necessary cyberlaws.[15] The Multimedia Development Corporation (MDC) was established as one-stop-shop for companies to ease the process of getting MSC status. In addition, the government set a Bill of Guarantee as new incentives for MNCs. (See Table 6.4)

Table 6.4: Bill of Guarantee

1. Provide a world-class physical and information infrastructure.
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.
4. Give the freedom to source capital globally for MSC infrastructure, and the right to borrow funds globally.
5. Provide competitive financial incentives.
6. Become a regional leader in intellectual property protection and cyberlaws.
7. Ensure no Internet censorship.
8. Provide globally competitive telecoms tariffs.
9. Tender key MSC infrastructure contacts to leading companies willing to use the MSC as their regional hub.
10. Provide a high-powered implementation agency to act as an effective one-stop super shop.

Source: www.mdc.com.my/mdc/index/html

The key project for MSC is Flagship Applications, "Multimedia Development" and "Multimedia Environment." (See Table 6.5 and 6.6) The former is to realize e-government and provide online services for the public. The latter is to provide optimal environment for the company entering MSC to facilitate high value added activities.

Flagship Application would bring efficiency and change people's lives. Some public services have already reduced the time of procedure. People can receive his/her own passport in 5 days after application. Before, it took 2 weeks. Also, it takes 2 weeks, reduced from more than 6 months before, to get re-issued ID cards today.

MSC is expected to yield high returns, however, that it will bring the expected benefits to the people and be a solution for social development is unclear. As we see in the case of Singapore, such sophisticated services could work if there is a solid IT foundation and understanding in the society. Malaysia still lacks such a basis, especially in rural areas.

Table 6.5: "Multimedia Development" Flagship Applications

Flagship Applications	Lead Agency
Electronic Government	Malaysian Administrative Modernization & Unit
Multi-Purpose Card	Bank Negara
Smart Schools	Ministry of Education
Telemedicine	Ministry of Health

Source: http://www.mdc.com.my/msc/flagship/index.html

Table 6.6: "Multimedia Environment" Flagship Applications

Flagship Applications	Lead Agency
R&D Cluster	Ministry of Science, Technology & Environment
Worldwide Manufacturing Webs	Ministry of International Trade & Industry
Borderless Marketing	MDC

Source: http://www.mdc.com.my/msc/flagship/index.html

3.2. Diffusion of PC and Internet in Malaysia

The PC and Internet penetration rate of Malaysia today is approximately 7 percent each. Even though the figure is still low, Malaysia is seen as a candidate for the knowledge-based society in the region.

International Data Corporations (IDC) predicts that Internet users will be about 4 million by the year 2004. There is no doubt that the number is increasing, however, the diffusion is occurring at the cost of rural areas. The increase is more restricted to the metropolitan area.

Table 6.7 shows the figure of telephone set per 1,000 people, mean

Table 6.7: Correlation Between Household Income and Penetration of Internet in 1997

State	Telephone Set per 1000 People	Mean Monthly Gross Household Income (RM)	Internet Access(%)
Johor	187.6	2772	11.1
Kedah	140.7 (kedah/Perlis)	1590	3.1
Kelantan	76.7	1249	0.8
Melaka	186.3	2276	3.2
Negeri Sembilan	180.9	2378	2.6
Pahang	127.2	1632	1.7
Parak	185.4	1940	5.3
Perlis		1507	0.5
Pulau Pinang	259.0	3130	10.5
Sabah	80.8	2057	2.6
Sarawak	110.3	2242	7.2
Selangor	309.1	4006	26.3
Terengganu	102.9	1497	1.1
W.P.Kuala Lumpur	239.8	4768	23.9
Malaysia	172.7	2607	99.0

Source: Infosoc Malaysia 2000 discussion paper on "Access and Equity: Benchmarking for Progress" http://www.nitc.org.my/resources/AccessEquity.pdf

monthly gross household income and Internet access rate in each state. The scatter of the three, Figure 6.9, 6.10 and 6.11, clearly shows the trend in Malaysian society that income is a key factor for IT penetration. Higher income states, such as W.P. KL, Selangor, Pulau Pinang and Johor, have higher rates of both telephone set and Internet access. A typi-

Figure 6.9: Telephone Set Per 1000 People and Mean Monthly Gross Household Income
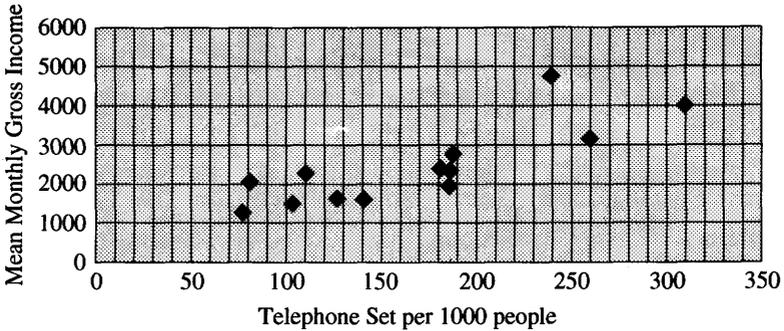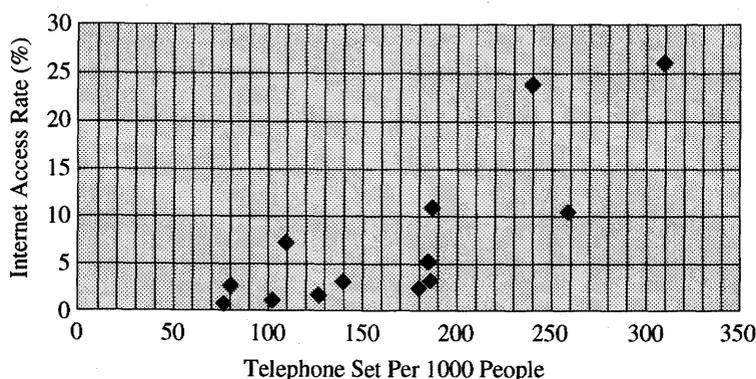

Source: Infosoc Malaysia 2000 discussion paper on "Access and Equity:
        Benchmarking for Progress."
        http://www.nitc.org.my/resources/AccessEquity.pdf

Figure 6.10: Mean Monthly Gross Income and Internet Access Rates
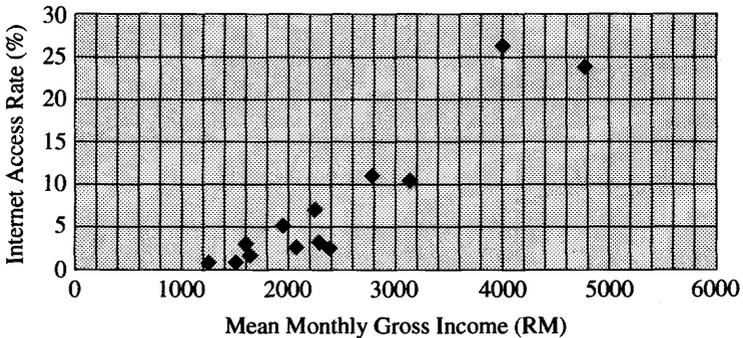
Source: Infosoc Malaysia 2000 discussion paper on "Access and Equity:
        Benchmarking for Progress."
        http://www.nitc.org.my/resources/AccessEquity.pdf

Figure 6.11: Telephone Set Per 1000 People and Internet Access Rates

Source: Infosoc Malaysia 2000 discussion paper on "Access and Equity:
        Benchmarking for Progress."
        http://www.nitc.org.my/resources/AccessEquity.pdf

cal Malaysian household can spend 17 percent of total income as disposable for optional needs such as purchasing PCs and TVs. While urban residents can spend about RM580 (about US$150) as disposable, the figure for rural residents is about RM285 (about US$70).[16] Concern with the price of PC and Internet accessing IT puts large financial constraints on rural residents.

Table 6.8: Penetration of Telephone Lines and Investment to Telecom Sector (%)

Country	Year	Largest City	Other Cities	National	Investment in Telecom as a % of GDP
Malaysia	1993	13.6	12.5	12.6	0.73(1987-91)
	1998	30.0	18.9	19.5	1.52(1992-96)
Thailand	1993	17.2	1.8	3.8	0.41(1987-91)
	1998	36.1	4.7	8.4	0.19(1992-96)

Source: Ohki [2000] and OECD [2000]

In addition to the financial problem, there is a problem of basic infrastructure. Even fixed telephone line is not completely laid yet in rural areas. As you see in Table 6.8, despite increased investment in telecommunications since the 1980s, the gap between the metropolitan area and

the rural cities has widened. The diffusion of IT in Malaysian society is still at the initial stage. Against this backdrop, the Malaysian government is implementing ambitious projects. Without laying a solid IT foundation in society, MSC will benefit only the upper level of society as the effect is concentrated in KL and large cities.

4. THAILAND

4.1. National IT Policy

In 1992, the National Information Technology Committee (NITC) was established to prepare, implement, and oversee the policy of IT development. The National Electronics and Computer Technology Center (NECTEC) was assigned to play a secretariat role for the NITC in 1992. At present, many NITC projects are implemented through NECTEC.[17]

In May 1995, the NITC announced a national IT plan, IT2000. The overriding object was to support national development, create equal opportunity of employment, education, and public services for all segments of society through applying IT. Three agendas were announced as the fundamental prerequisites for realization:[18]

1. Build an equitable national information infrastructure
    (1) Build universally accessible information infrastructure in accordance with new information age.
    (2) Ensure that a reasonable share of the benefits be given to rural regions.
    (3) Deregulation and privatization of telecommunications sector.
2. Invest in people
    (1) Develop IT manpower at all levels to eliminate the current shortage .
    (2) Fulfill the aspirations of all citizens for continuing education and upgrading skills.
    (3) Make full use of IT in education.
    (4) Create user friendly and attractive content to meet local demand.
3. Enhance government services and forge a strong information industry
    (1) Make full use of IT in all public agencies to provide efficient social services to all citizens at reduced costs.
    (2) Provide full support in particular to SMEs for the local information industry.

Much attention was paid to creating equal opportunity, individual devel-

opment, and other social aspects. Becoming an information hub in the region was not their concern. However, the government launched a new plan before achieving the target of IT2000. The government has a fear of being left behind Singapore and Malaysia. It, therefore, compromised equal social development for creation of an information hub city in Phuket.

In May 2000, the government issued a new plan called "Phuket IT City." Today, the project is called "The Greater Phuket Digital Paradise Project (PhD)." It is said that 4 billion baht is necessary to build information infrastructure, educational campuses and other facilities for the project. However, the project already has a shortage of funds and there are some criticisms about the readiness of Phuket's basic infrastructure such as telecommunications and electricity.[19] Details of the project have not yet been announced.

4.2. Diffusion of PC and Internet in Thailand

PC and Internet penetration rates in Thailand are approximately 2 percent and 1.6 percent respectively. Compared to Singapore, the penetration rates in Thailand are exceedingly low, and even lower than those of Malaysia. Thailand is still at a very early stage but many statistics and IT related literature expect the rates to increase rapidly.

According to SG Security Research, PC penetration in Thailand will be 1.7 million people in 2001, 2 million in 2002, and 2.5 million in 2003. IDC predicts that Internet users in Thailand will grow 40 percent a year until the year 2004 and the government estimates that Internet users will be 14 million by the year 2008.[20] However, Thailand is faced with the same problem as Malaysia.

According to statistics of the NITC, approximately 70 percent of Internet users are resident in Bangkok Metropolitan area. While there are 7.66 million available fixed telephone lines, 5.22 million are connected.[21] Of them, more than 50 percent are concentrated in the Bangkok Metropolitan area. *The Bangkok Post* said, "Most major provincial towns outside Bangkok now have a local number that users can call to access the Net, but a more pressing problem exists that telephone lines to homes or even businesses outside the major provincial centers are virtually non-existent."[22] Even so, investment into the telecommunication sector decreased from the 1980s to 1990s and the gap has widened. (See Table 6.8)

Another aspect is that a PC costs more than twice or three times as much as the monthly income of most people. PCs at home may not be necessary because people can use them and access the Internet at school or in the workplace. In Thailand, 21.1 percent of secondary schools and 100 percent of the universities are connected to the Internet. The fact that 69 percent of the users are in their teens and twenties reflects that most of them access the Internet at school or workplace.[23] However, accessing Internet at these places puts some limitations on time and contents. A key for expanding IT literacy and its utilities is having a PC at home.

One factor that always fingered as an obstruction to Internet diffusion in Thailand is the monopolistic structure of the telecommunications sector. Internet Service Providers (ISPs) must give a 32 percent stake to the Communications Authority of Thailand (CAT) to get a license while CAT does not make any capital investment. Also, ISPs must reserve another 3 percent shareholding for CAT employees on a voluntary basis. In addition, ISPs must use expensive CAT connection lines. These factors combine to make operating costs high. Liberalization of the telecommunications sector was finally decided on October 26, 2000 by the Cabinet. CAT and the Telephone Organization of Thailand (TOT) will be privatized by the year 2006.

5. CONCLUSION: IS IT MEETING WITH THE DEMAND OF THE PEOPLE?

In Southeast Asia, every government has committed to IT policy. All of them are at different stages of development and each country has its own aim and meaning of information society. However, we can envisage some common issues, which other regional countries will have to face sooner or later, from the experiences of Singapore, Malaysia and Thailand.

First, there is a gap between the government and the public. In the case of Singapore, the government has prepared information infrastructure with equal access and more than a hundred online public services, but such preparations do not meet with public demand. Users do not access newly developed services very much. PC and Internet penetration rates are one of the highest in the world and IT education is spread into every school, but usage is not sophisticated enough to utilize new services yet. Upgrading people's consciousness, understanding and computer literacy have to be done more to bridge the gap between the government

and the people. The issue is more serious for Malaysia and Thailand.

Second, in Malaysia and Thailand, there is a gap between urban and rural areas. For the time being, IT widens the gap between them. In both countries, IT users are concentrated in metropolitan areas. Even fixed telephone lines are not yet consolidated in rural areas. Even so, their national IT policies do not pay much attention to the social aspects but to economic and business aspects. The case of Singapore tells us that the success of IT projects are, to a large degree, dependent on the basic IT foundation in the society in terms of infrastructure, IT literacy, awareness and understanding of the people. Without them, the effect of the project will be much restricted, and only centered on certain cities.

Third, there is a gap between rich and poor. In the case of Malaysia, we see that the higher income states have higher Internet access rates. Even in Singapore, where people can afford to buy PCs and subscribe to the Internet easier than in the other two countries, we see a similar trend. GDP per capita of Malaysia and Thailand is still about US$4,000 and US$2,000 respectively. Other countries in the region have significantly lower income levels. PCs and other related materials are still expensive for them. Thus income is always a key factor of diffusion.

Singapore has realized both economic development and information society so far. Malaysia and Thailand are trying to leapfrog intermediate stages by taking late adopter's advantages. Technological innovations and wireless communications might help them to realize it and bridge the gap between urban and rural. Liberalization and competition will reduce the prices and may bridge the gap between rich and poor. The total impact and results of IT cannot be judged at this stage. We are still in the period of transition. However, as we see in the case of Singapore, there is no guarantee that people will respond to the new technology and apply it skillfully to everyday life. Policy makers should recognize that ongoing projects may not meet with public demand and that ongoing national IT projects may be restricted to certain people and areas.

For many governments, IT becomes their political and economic goal, however, IT is not a goal but an instrument which people can exploit to improve their quality of life and develop a better society. While many governments commit themselves to IT, much attention is paid to the supply side of government and business activities. We should be more careful about other aspects especially the needs of the people.

Notes

1   The land size of Singapore is 618 km^2. According to the latest Census, population of the country is 4,017,733 and Singapore residents are 3,263,209.

2   Yip [2000], p.155.

3   Rodan [1998], p.70.

4   Trade Net is an EDI system that links all kinds of company involved in international trade. It reduced the time of submission of applications and other related procedure from 1~2 days to 15 minutes. School Links is linking primary and secondary schools with the Ministry of Education to improve efficiency of school work. Law Net is the first full text legal database in Southeast Asia.

5   OECF [1996], p.50.

6   See http://www.s-one.gov.sg/overview/s1def01.html for more details.

7   Singapore One incorporates the latest digital technologies in an optimized, integrated network. With its huge amounts of bandwidth, Singapore One delivers information to subscribers at least at 100 times as much as the speed of Internet dial-up through a normal 56.6kbps analogue modem. See http://www.s-one.gov.sg/overview/s1def01.html for more details.

8   Takayasu [2000], p.142.

9   This is the fourth survey and the first survey was conducted in 1990.

10   The figure is as of October 2000 from Statistics for Telecom Service available at http://www.ida.gov.sg.

11   CICC http://www.cicc.org.sg.

12   Vision 2020 is a national agenda aimed at making Malaysia a fully-developed nation by the year 2020.

13   Multimedia Development Corporation (MSC) www.mdc.com.my/mdc/index/html.

14   The core of infrastructure is Cyberjaya and Putrajaya. Cyberjaya will be a city of 7,000 hectare (core area is 2890 ha) offering a world-class information communication network and facilities. Residential, commercial, public, and entertainment areas are also being developed. As a nucleus of the MSC, there will be about 500 companies and 100,000 residents in the area by the end of the year 2020. Putrajaya will be a new administrative city of 4580 ha with 76,000 working people and 250,000 residents. It will be the center of electronic government by the year 2005. In July 1999, the Office of the Prime Minister and the residence of Prime Minister Mahathir moved to the city from KL.

15   6 laws are Digital Signature Act, Computer Crime Act, Copyright Act, Telemedicine Act, Electronic Government Act, and Multimedia Communication Act.

16   Infosoc Malaysia 2000, Discussion Paper on "Access and Equity:

Benchmarking for Progress."
[17] NECTEC was established in 1987 to provide research and development in electronics, computers, telecommunications and information. Since 1992, as a secretariat of NITC, NECTEC also plays the role of serving local electronic and computer industries and giving research funds to universities, etc.
[18] See NITC, http://www.nitc.go.th/it-2000/exec.en.html
[19] *Nihon Keizai Shimbun*, 23 June, 2000 and *Bangkok Post*, 8 November, 2000.
[20] *Bangkok Post*, Economic Review 2000 Mid-Year Edition.
http://www.bangkokpost.com/MidYear2000/11ecommerce.html.
[21] The figure is from the presentation of Thaweesak Koanantakool, "The Struggle Towards a Knowledge-based Society," at Information Technology and Development Cooperation, held on 3-4 July, 2000 in Tokyo Japan.
[22] *Bangkok Post*, Database 10 Years.
http://www.bangkokpost.net/data10y/pages/new2.html
[23] *Nihon Keizai Shimbun*, 1 November, 2000.

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