The European Union's Asia IT&C Programme for Indonesia

Promoting Internet Policy and Regulatory Reform in Indonesia

Assessment Report, February 2003:

Status of Information and Communication Technology Development in Indonesia

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Introduction

Information and Communication Technology (ICT) has become a famous expression since the emergence of the Internet. Several years ago, when the Internet was not as popular as nowadays, people talking about information technology (IT) had in their mind something different from communication tools. In fact, with the emergence of data communication, the distinction between telecommunication and IT has become irrelevant. They are now converging; a result of this convergence is the Internet and its derivative applications.

Although at the beginning Internet activists paid more attention on the technical side, now that the Internet growth has become massive, paying attention only on technical matters is not sufficient. The Economist magazine on its January 23rd, 2003 edition mentioned in an article: *"The biggest decisions about the internet's future will be political and social, not technological*." In line with the Economist, in an earlier publication, Zoë Baird, President of the Markle Foundation, mentioned in her Paper *Governing the Internet, Engaging Government, Business, and Nonprofits*, (December 2002), that the rapid growth of the Internet has led to a world wide crisis of governance.

The situation that occurs in developed countries also happens in developing country like Indonesia, although its magnitude and character are slightly different. In most part of the country, there is a problem of accessibility, as the existing regulations are restrictive in nature and do not facilitate the growth of the industry. Dominance player in telecommunication services as legacy of the old regime still prevails. Although the voices to competition have become louder and louder in recent days, and while the Government in its function of regulator has issued the Blue Print of Government Policy on Telecommunication Development Strategy, nonetheless, the market still puts strong barriers for new entrants to come in. Consequently, people in rural areas suffer from the lack of information and telecommunication. Evidences of political, social and economic issues relating to the use of Internet have emerged in several cities in Indonesia. Nevertheless, current legal frameworks have not been able yet to fix the problems.

Fortunately in this kind of environment, there are numerous initiatives coming from the private sector to proactively get involved in the development of ICT. Not willing to be seen as a passive actor, the government has recently established the Ministry of Communication and Information (MCI), which is responsible for making ICT development policy. The MCI, in collaboration with the private sector, develops several programs in effort to optimally develop ICT for increasing governance and the quality of government services.

Demographics

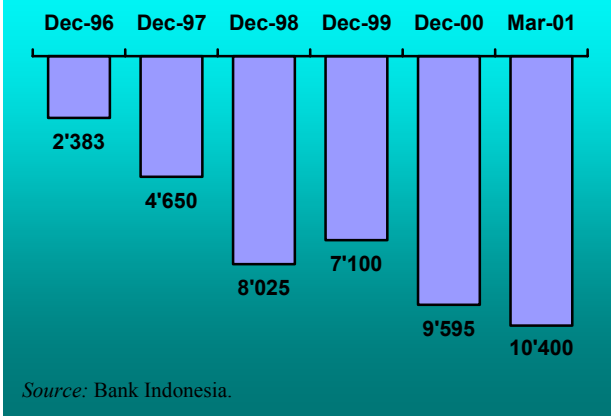
Located in South East Asia, the Republic of Indonesia is primarily made of water. Out of a total area of 9.8 million square kilometres, 81 per cent is sea. The country is divided into 32 provinces, 362 regencies, 73 municipalities, 4'044 sub-districts and 69'065 villages. The population of the country was projected at 210.5 million in 2000, a growth

rate of 1.4 per cent compared to the previous year. The growth rate is down from some two per cent in the period 1980-90 reflecting the success of family planning programs. The distribution of Indonesia's population is heavily skewed. The capital Jakarta, located on the island of Java, had an estimated population of 12.6 million in 2001, accounting for almost 5 per cent of the country's total inhabitants. The island of Java is home to some 59 per cent of Indonesians but only accounts for 6.6 per cent of the land area. At the opposite extreme, the province of Papua (formerly: Irian Jaya), in the far east of the country, contains some 22 per cent of the territory but just one per cent of the population. Some 60 per cent of the population lives in rural areas. There are an estimated 51.2 million households or just over 4 members per household.

Economics

Indonesia's per capita income of US$ 570 has plunged by almost half since its peak of US$ 1'110, just before the economic crisis.[1] The drop was first a consequence of the Asian financial crisis, which began in Thailand in July 1977 and then rippled through the rest of the region. Exchange rates plummeted (see Figure 1) as investors pulled out of Asia. The decline in Indonesia's economy—GDP and exchange rate—was its sharpest since independence and awakened suppressed political and social chasms. These in turn led to instability that has frozen foreign investment and kept the country in limbo, forcing it to turn to the International Monetary Fund for a US$ 10.4 billion loan in November 1997.[2]

Figure 1: Freefall
United States Dollar middle rates against Indonesian Rupiah



Source: Bank Indonesia.

The crisis—capped by a decline of economic output if 13.1 per cent in 1998, the highest in Asia—brought to end several decades of impressive growth. Economic expansion was initially sparked by oil—Indonesia is the only Asian member of the 11-nation Organization of Petroleum Exporting Countries (OPEC). Later, as in most East Asian countries, Indonesia embraced trade—particularly in manufactured goods—to diversify and grow its economy. The results led to an annual average economic growth of 6.3 per cent between 1983-92 and annual average of over 7 per cent between 1992 and 1996.

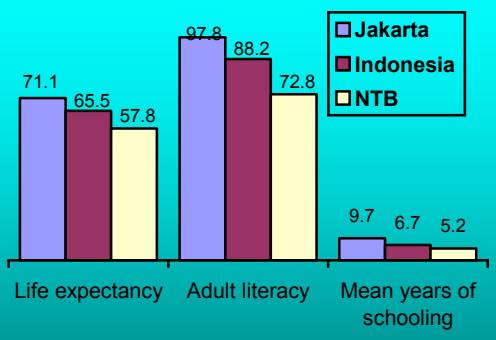
[1] World Bank. "Indonesia Data Profile." http://devdata.worldbank.org/external/CPProfile.asp?SelectedCountry=IDN&CCODE=IDN&CNAME=Indonesia&PTYPE=CP

[2] In support of the loan, Indonesia had to commit to a 48 point 'Memorandum on Economic and Social Policies.' See "Indonesia Letter of Intent." 31 October 1997. www.imf.org/external/np/loi/103197.htm

Human Development

In the year 2000, Indonesia found itself ranked 109th out of 174 countries, placing it in the medium human development grouping. Although one of the lowest ranked South East Asian countries (only above Myanmar, Cambodia and Laos), Indonesia is about where it should be in terms of human development given its per capita income. There is cause for concern however as Indonesia's rank has been slipping, again caused by the economic crisis. This is reflected in national poverty statistics that show the percentage of the population living in poverty rising over the last few years (although there was a decline in 1999). There is also a national human development divide, with a notable gap in life expectancy, adult literacy and mean years of schooling between Jakarta and other parts of the nation. Indonesia thus has pressing economic, health and education problems to redress that may divert attention from ICT.

Figure 2: Human Development Gaps
1999



Note: NTB refers to Nusa Tenggara Barat, the lowest ranking of Indonesia's 27 provinces in terms of human development.

Source: BPS.

General Problems in ICT Policy and its Development

The general problems encountered by the ICT sector in Indonesia are quite classical:

- low ratio of teledensity, due to the lack of telecommunication infrastructures,
- low Internet penetration due to the inconsistency of regulations and the discriminative treatment by the incumbent operator,
- the market is dominated by dominance players,
- and some of the telecommunication policies are inappropriate and have a direct impact on Internet services such as telephone tariffs, interconnection, and prohibition of VoIP provision by ISPs

All of these factors have become a big constraint that impedes the ICT and Internet proliferation.

In addition to the above-mentioned problems, ICT communities have come to a common understanding that the country seriously needs a national leadership, which would pay great attention to and give directives in the development of ICT. People, particularly in the ICT communities, perceive that the President is only half hearted with the ICT development.

During the last two years, there were several issues surrounding ICT and Internet business in particular.
These issues are, among others:

- the fight of ISPs against TelkomNet Instant;
- the prohibition of VoIP provided by ISPs;
- the existence of dominance telecommunication services player;
- the slow growth of e-commerce and e-business;
- the implementation of e-procurement in several national companies;
- the government as a potential market of ICT applications;
- the divestment of government shares in telecommunication operators as a following action of the privatization policy;
- the settlement of cross ownership between TELKOM and INDOSAT and their business partners;
- and the merger of PCS-1800 operators, due to the slim market in these services.

Regulations

Regulations have become a central issue during the last two years. As in 1999 the government issued The New Telecommunication Law (Law Number 36/1999), the operational directions in the forms of Government regulations or Ministerial Decrees had to be issued. Despite the complexity of political and economic circumstances, these all led to incomplete and somehow controversial policy and regulation products.

Big concern rose among the stakeholders in response to repeated unsound telephone tariffs. TELKOM, as the de facto monopolist, has been unable to calculate telephone tariffs using a cost-based formula. As a result, every year TELKOM requests the Regulator - in this case the Directorate General of Post and Telecommunication (DITJEN POSTEL) - to increase its telephone tariffs. On the other hand, as competition is already taking place in mobile telephone services, cellular operators demand fairness and justice in the interconnection tariffs, while until now, TELKOM still holds the domination to set the formula.

VoIP provision had been limited and given only to five operators. More than 50 ISPs which operated VoIP services prior to the Ministerial Decree had to stop the services. Should ISPs want to extend their VoIP services, they have to be the distributor of one of the five. Pros and cons upon the VoIP provision policy that emerged within the community did not make the Transportation Minister or Director General of POSTEL consider changing the policy.

Licensing for telecommunication and Internet provision still does not change much. The "First Come, Fist Served" method prevails for almost all kind of services. In addition, the cost of license acquisition has become terribly high due to the fact that bribing and unofficial fees have to be paid unless the applicants do not seriously want to run the business. One of the areas in which licensing is relatively non-transparent is radio frequency licensing. Due to the lack of E1 or fixed lines, many Warnets or Internet users use 2.4 GHz microwave link. The users assume that 2.4 GH is the ISM band, which under certain conditions does not need licensing. Problems rose when the Spectrum Management put the radios down and threatened those who were still using (the radios)

without license by announcing they would be considered as criminals and therefore be prosecuted. However, when users want to obtain licenses, the officials say that there are no definitive tariffs yet for the ISM band usage.

Other increasingly important regulations to be addressed were the formation of an Independent Regulatory Body (IRB), and a Universal Service Obligation (USO). Apart from the above issues, which were dealing more with the telecommunication infrastructures, there were interesting regulatory issues in the area of ICT particularly following the growth of the Internet: The Presidential Decree Number 6/2001 (INPRES 6/2001) and its Action Plan, National Information System (SISFONAS), which seems to overlap with INPRES 6/2001, the government plan to develop e-government, and the progress of cyber laws.

Telecommunications

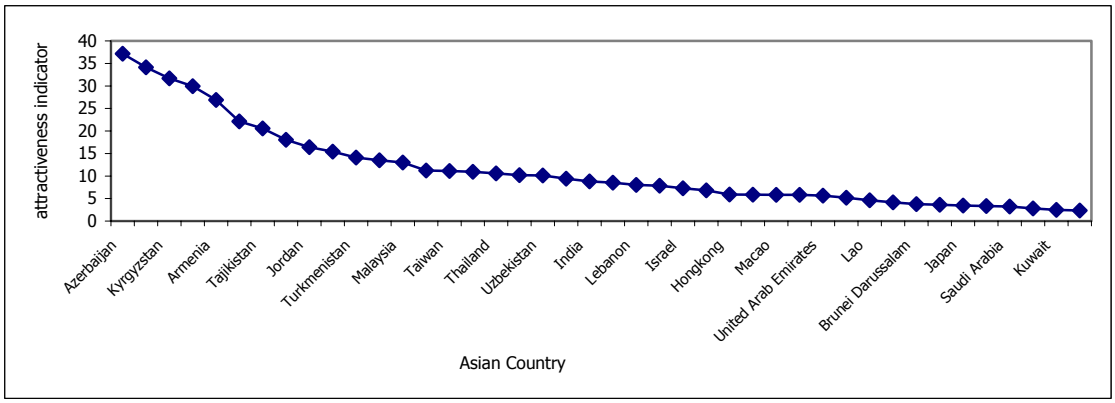
By the end of 2001, Indonesia had around 13.25 million phone lines (fixed and mobile), equivalent to 6.77% of the population. This makes Indonesia rank 35th among the 45 Asian countries, as stated in the ITU-2002 report on Telecommunication progress in Asia Pacific. The low ranking of Indonesia shows the lack of telecommunication infrastructures, although if we consider the attractiveness indicator, Indonesia is on the 23rd position. The attractiveness indicator is one of the many indicators foreign investors usually use for deciding whether or not to invest in the telecommunication sector in a particular country. The indicator is calculated using the ratio between the penetration of telephone lines and the GDP per capita, which reflects the availability of telephone lines compared to the affordability of the country. In general, the smaller the number, the most attractive the country is to investment.

For Indonesia, an interesting fact is that although the availability of telecommunication is considered as minimal, foreign investors are not interested to invest. Apart from the small power of purchasing, as a consequence of the low GDP, there are other reasons for foreign investors to not come and invest in Indonesia, such as the non-conducive environment in Indonesian telecommunication industry.

The monopoly in telecommunications, the government's intervention in the market in its capacity of policy maker, regulator, and operator, and the restrictive regulations which impair the private sector to participate in telecommunication services, have been perceived as the ultimate reasons for foreign investors' reluctance to participate in Indonesia's domestic market. Global world changes and the rapid advancement in telecommunication and information technology have created such essential changes in national telecommunication provisions that eventually Indonesia will need to reform its telecommunication sector. If in the beginning telecommunication was treated as a public good, now it has become a trade-able commodity with high commercial value, especially following the convergence phenomenon between telecommunication and information technology.

The essence of the telecommunication sector reform covers the restructuring of legal frameworks, the telecommunication industry, as well as the liberalization of the telecommunication business. Table #1 bellow indicates the comparison between Law Number 3/89 (the old one) and Law Number 36/1999 (the new one).

Figure 3
Attractiveness Indicator



In 1999, the Indonesian government issued the Telecommunication Law Number 36/1999 to replace the old one, together with launching The Blue Print of Government Policy on the Telecommunication Development Strategy. The New Law and the Blue Print give directions for the telecommunication sector reform, which covers the importance of making new policy on restructuring and liberalizing the telecommunication industry. The reform basically contains three main essential steps to be taken:

(1) Ending the monopoly of the incumbent operator by letting new entrants and stimulating competition in all level of telecommunication provisions, and at the same time protecting the market from anti-trust or anti-competition behaviours.
(2) Razing discrimination and restrictive measures that impede the private sector to participate in the provision of telecommunication networks and services. In other words, putting all the players of the field on an equality foot.
(3) Redefining the role of the government. In future, the Government will act only as a policy maker, and no longer play both roles of the operator and the regulator.

Currently, the Government is settling the dispute between PT. Telekomunikasi Indonesia (TELKOM, the incumbent operator) and its partner following KSO/Jointly Operation Scheme that started from 1996. In addition, the government has decided to put an early end to the exclusivity rights belonging to TELKOM, and INDOSAT, for monopoly in local, and long distance, and international connections respectively. Initially, TELKOM held the exclusivity right in local and long distance provision up until year 2010, while INDOSAT held the same rights for international connections up until 2005. The early termination policy made the monopoly in local connections end on the 1st of August 2002 (last year), while the monopoly for long distance and international services will be ended on the 1st of August 2003.

This means, during the transition period from monopoly to full competition, the Government applies a duopoly policy. At the same time the Government should take the necessary actions to strengthen the basis for competition by, for instance, making a policy on tariffs formula, interconnections, numbering, Universal Service Obligation (USO), clearing house, licensing, Independent Regulatory Body (IRB), as well as anticipating for Internet provision policy.

Another reason why the teledensity is so low in Indonesia is the high cost of building telecommunication infrastructures. According to TELKOM, in the early 90s, the minimum cost for one fixed service line was US$ 1,000. This meant that TELKOM required US$ 1 billion for 1 (one) million of fixed lines services. Unfortunately, TELKOM did not have that amount of money, while the Government had not allocated anything for telecommunication infrastructure development in the national budget since 1985. Both the Government and TELKOM made a joint scheme operation to overcome the lack of internal investment. The government is also developing a new scheme for investment in telecommunications, but until now there is no successful result.

Table 1
Comparison of the Old and the New Telecommunication Laws

No.	Description	Law Number 3/1989	Law Number 36/1999
1.	Roles of Government	Owns, builds, and operates the telecommunication services	Decides policy, regulates and supervises the telecommunication sector.
2.	Providers	Government through Provision Body	SOCs, LGOCs, privates, and cooperatives
3.	State of provision	Monopoly and Duopoly	Competitive
4.	Categorization of provision	Basic services, non-basic, and special provision	Networks services, telecommunications services, and special provision
5.	Business operation	Joint Venture, JOS and management contract	Business driven
6.	Tariffs	Government makes rules	Market oriented
7.	Others		No longer monopoly, USO, licensing, numbering, and interconnection

Information Technology

In relation with the development of Information Technology (IT), the Government has put in the National Development Program (PROPENAS) and the Yearly Development Plan (REPETA) directions for the government agencies to develop and implement an IT development policy in line with the national reform and decentralization which is

ongoing since the year 2000. Online government services or electronic government have become a common goal within the government since the President set up the new MCI.

Realising this goal is not an easy task, and some problems remain which could potentially hold back the progression of such developments, i.e.:

1. *The lack of availability and unbalanced distribution of information and telecommunication infrastructures*.

   More than 86% of telecommunication infrastructures are located in the west area of Indonesia: Java, Sumatera and Bali. It is understandable since the majority of the population live in these islands. It is however ironical; these three islands represent only 30% of the Indonesian territory.

   The provision of information and telecommunication infrastructures in Indonesia basically follows the pattern of how and where people live. Business wise, this is acceptable. Nevertheless, the development of information and telecommunication infrastructures is the primary condition for facilitating new opportunities in economic and social developments. The lack of such infrastructures, particularly in the eastern region of Indonesia, makes it hard for people to access information and they are therefore slightly behind their colleagues in Java, Sumatera or Bali.

Table 2
The Profile of Telecommunication Infrastructures

Divisions	**I** Sumatera	**II** DKI	**III** West Java	**IV** Central Java	**V** East Java	**VI** Kalimantan	**VII** Eastern Indonesia	**TOTAL**
Capacity (lc)	1.220.252	3.214.035	878.516	770.234	1.530.528	390.545	800.334	8.804.444
Lines in Service (lc)	1.007.468	2.941.533	705.777	739.315	1.430.341	353.394	762.105	8.055.306
Population (million)	46,4	24,5	26,8	41,5	38,6	13,0	32,1	222
Penetration (%)	2,17	10,73	2,52	1,49	3,41	2,45	2,11	3,25

Note: lc = line connections

2. *The absence of use of alternative telecommunication technologies*

   With the advance of technology, particularly in telecommunication and IT, alternative technologies are available to fill the gaps such as the High Altitude Platform System (HAPS) - a balloon moored to the ground by a wire, and that's capable of carrying tons of telecommunication equipment: Transceivers, BTS, Switching, etc. - or the Power Line Communication (PLC), a communication system using electricity distribution networks.

The National Electricity Company (PLN) has made a series of attempts at using PLC, and the results were almost satisfactory. Nevertheless, PLN is not yet able to offer telecommunication services using PLC since the regulation still prohibits PLN to do so. The Directorate General of Posts and Telecommunication (DG POSTEL) - the telecommunication authority - has refused to award PLN a license, for it is not in line with its duopoly policy.

3. *The rare sources of funding for the building of the new information and telecommunication infrastructures*

   Many people believe that information and telecommunication can be a locomotive for economic growth. Yet, until now it is hard to measure the role of investment in the information and telecommunication sector in the growth of GDP, or its contribution to it. However, the International Telecommunication Union (ITU) put forward a recommendation saying that a 1% increase in teledensity would drive a 3% increase in GDP. Meanwhile, a study carried out by Sallstrong Consulting in 2001 concluded that a 10% increase in IT spending would drive a 13% increase in GDP[3].

   According to the Sallstrong report, in 2001 Indonesia spent only 0.6% of its GDP to purchase IT and telecommunication equipment. Although it was an increase compared to the previous years, the figure was the smallest among many other countries in Asia, like India 1%, Philippine 2.4%, Singapore 3.7%, and Thailand 1.2%.

4. *The telecommunication reform, as mandated by Law Number 36/1999 and The Blue Print of Government Policy on Telecommunication Development Strategy, had not been carried out properly.*

   The duopoly policy does not lead to developed information and telecommunication sectors. The Telecommunication Network service, which became the main infrastructure for other value added services such as the Internet, is still dominated by TELKOM. In addition, TELKOM runs its own ISP called TELKOMNet Instant, which then operates like a predator with other small ISPs. In order to expand TELKOMNet Instant in a short time and to protect it from competition, TELKOM management gives a privilege subsidy to TELKOMNet Instant. Although the subsidy makes TELKOMNet grow, it does not make the market grow. Current Internet users move to TELKOMNet, since its tariffs are relatively low for short duration of use.

   TELKOMNet Instant would not become a threat to other ISPs if TELKOM didn't apply a discriminative policy. Without a two parties' consent, TELKOM made the E-1 connection tariff to ISPs increase 1000%, a company policy which slowly makes ISPs shut down operations one after another.

[3] Laura Sallstrong, Economy, The Study on Information Technology and Its Critical Roles in Software Development and Services, 2001.

The list of inconsistencies with the Law Number 36/1999 and the Blue Print may be extended to other examples such as the non-transparent VoIP regulations, INDOSAT divestment, the progress of USO policy, the unclear policy on licensing, telephone tariffs, etc.

5. *People's lack of awareness of the benefits of ICT*

   Various studies reported that computer literacy in Indonesia is considerably low. In the digital era in which information plays an important role in the economic development, people's awareness and knowledge of the benefits of ICT need to be upgraded to make it strong and winning the competition.

6. *There is no definitive National ICT Development Master Plan*

   There has been a lot of national ICT development plans in the past, but they always ended with uncertainty since every new regime created a new plan replacing the previous one, even before its implementation. It was the President Soeharto who first made a decree on the formation of Tim Koordinasi Telematika Indonesia – (TKTI) or the Indonesian Coordination Team on ICT. Soeharto appointed the Coordinating Minister of National Production and Distribution, Mr. Hartarto, to be the head of the Team. Mr. Hartarto then created BAKOTAN (the Coordinator Agency of Automation of National Administration). During this period, the Team issued two important plans: the National Information System (NIS), and Nusantara 21. The first was designed to develop the information system throughout the country, not only in government offices but also including application connectivity to private sectors. Nusantara 21 was a big idea to build fibre optical backbones that would cover the whole country.

   Following the end of the Soeharto regime, B.J. Habibie's raising into Presidency, and the economic and political crisis, both NIS and Nusantara 21 disapeared with their authors. However, Habibie then created TKTI through the Presidential Decree Number 186/1998 but this new TKTI (Habibie's version) did not make any good progress. In 2001, without the Presidential consent, the National Development Agency (BAPPENAS) started a project called the National Information Technology Framework (NITF).

   The deliverable of NITF study was not launched until the end of Habibie's regime. Unfortunately, when Mr. Wahid won the Presidency he did not pay much attention to NITF; this led to the early end of NITF. NITF remained only as a study result; it was never implemented or became a national ICT policy. President Wahid then issued his decree to form the New TKTI, which then fell under the leadership of Mrs. Megawati Sukarnoputri. The particularity of the new TKTI was the involvement of the private sector as members. MASTEL (The Indonesian ICT Society) and KADIN (The Indonesian Chamber of Commerce and Industry) were among the members. In April 2001, TKTI had successfully proposed its draft for a National Plan for ICT Development, which then the President agreed to make into the Presidential Decree

Number 6/2001. Ironically, the decree, which was then completed with an Action Plan, was not implemented by many government officers.

When Mrs. Megawati had just become President, she formed the MCI to be the agency making national policies on the development of ICTs, including broadcasting. This decision created confusion and raised questions among people, since the MCI relates to communication but does not deal with telecommunications. Policy and regulation of telecommunications are still under the order of the Ministry of Transportation. Meanwhile, although TKTI (Mr. Wahid's version) still existed, it did not function as it had to, since the members who were all members of the cabinet, had been replaced. Knowing of the Presidential Decree Number 6/2001, the MCI bureaucrats nevertheless do not use it as the main reference when making ICT policy, or even implement it; instead of this, they developed a new development strategy plan, which they then called SISFONAS (National Information System). This SISFONAS is, in fact, totally different from its predecessors. Recently, the President issued a new decree on setting up a new TKTI, but this time chaired by The Minister of the MCI. In the past, at least the Vice President chaired TKTIs. As we write this report, there is yet no sign of a policy draft issued by this new TKTI.

As a result of the discontinuity in ICT policy, it is understandable that the information systems of most government agencies do not connect with each other. They create the so-called, islands of information systems. Redundancy of databases, applications, or other resources has become a common and accepted condition in Indonesia. In addition, the existing policy also creates obvious disparities among government agencies in adopting ICT. A few institutions are very much advanced in using ICT, while on the other hand lots of others are very deficient in adopting ICT.

Indonesia Internet Market Developments

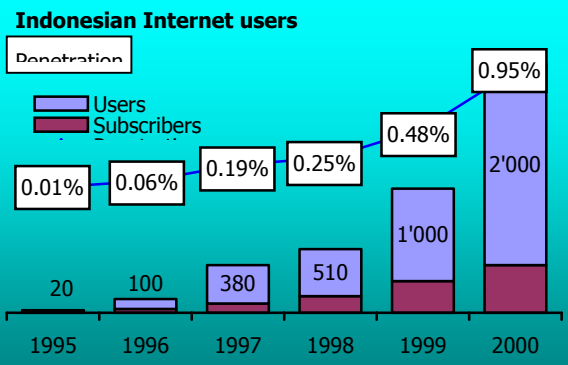
Indonesia connected to the global Internet in 1994, as a result of pioneering efforts by the academic and research community. One of the first links was a 64 kbps line to the US opened in May 1994 by the Indonesian Science and Technology Network (IPTEKnet). RADNET claims to have been the first commercial ISP to be licensed, launching services in May 1995.[4] By the end of 1995, there were some 16 ISPs, 20'000 users and 640 kbps of international Internet connectivity.[5] At the beginning of 2001, there were some 150 licensed ISPs of which about 60 were actually providing service and over 150 Mbps of international bandwidth. At the end of 2002, there were an estimated 800'000 Internet dial-up subscribers translating to roughly two million users, or just under one per cent of the population.[6] The number of users has doubled over the last two years, following a period of stagnancy at the peak of the financial crisis.

[4] See "Mission and Objectives" on Radnet's web site (29 June 2001). http://www.swa.co.id/company/index.html
[5] Soegiardjo Soegijoko, Onno W. Purbo, Widiadnyana Merati, Priyono Sutikno, Intan Achmad. *Computer Networking in Indonesia: Current Status and Recommendations for its developments.* Institute of Technology Bandung. January 1996. < www.panasia.org.sg/itb/apng2.htm >
[6] www.apjii.or.id

Despite the large number of ISPs, the market is dominated by a handful of companies. The largest paying ISP is TELKOM's TELKOMNET Instant with just over 350'000 subscribers at the end of 2002. Many of these users are using TELKOMNET's nation-wide four-digit dial code service. As no prior registration is required, TELKOMNET calculates subscribers based on usage over the last month. Ironically, TELKOM had been prevented from entering the ISP market prior to 1997. At that time, the government wanted to promote new players in the market, especially Small and Medium Enterprises (SMEs). However the SMEs did not perform well so the law was changed to allow bigger companies in and attract investment.

INDOSAT also provides ISP services and had over 75'000 dial-up subscribers at the end of 2002. There was no growth in 2001. INDOSAT claims that this was partly related to delays in obtaining leased lines from TELKOM. Another factor was the launch of 'free' (users still have to pay telephone dial-up charges) Internet access by LINKNET in April 2000. By the end of 2000, LINKNET had signed up 197'000 subscribers, making it the country's largest ISP. LINKNET had hoped to make money through advertising and e-commerce transaction fees since TELKOM refused to share telephone usage charges. However this model was unsustainable and LINKNET was forced to put an end to its free service in March 2001 and it now charges for its services like other ISPs. It lost most of its subscribers who chose not to stay on a pay plan.

Figure 4: Internet market



Source: APJII, ITU.

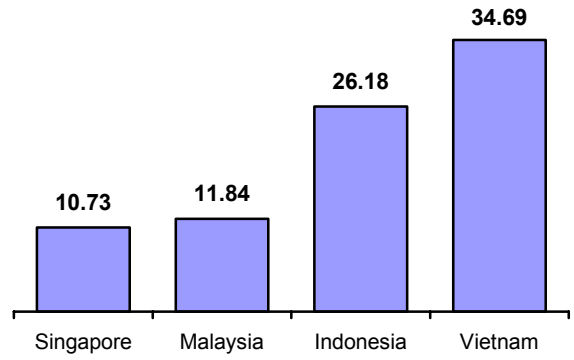
This far, there has been little foreign investment in the ISP sector. One exception is M-Web of South Africa which purchased 35% (which was the maximum foreign investment allowed at that time) of Cabinet in August 2000. Cabinet owns Satunet, which claims to be one of the leading Indonesian portals with some half a million daily page views and 80'000 email users. M-Web's move followed an expensive strategy. It bought Astaga.com (a competitor of Satunet) and Warnet Gemilang (a chain of Internet Kiosks business) in order to be the leader in end-to-end Internet services, since M-Web also ran web hosting, co-location, and web-design services. In 2001 M-Web signed collaboration with the Gajah Mada University of Jogjakarta, Airlangga University of Surabaya, and the University of Indonesia in Jakarta to build Internet Access Centres. M-Web was successful in Jog Jakarta only; in Jakarta their plans were never realized. This aggressive strategy unfortunately was not followed by sufficient revenue streams; this led to M-Web's decision to shut some of its business off, and eventually to sell off its ISP. As we are writing this report, M-Web does not exist in Indonesia anymore.

Tariffs

There are two Internet dial-up options in Indonesia. One is Telkom's ISP, TelkomNet, which has a nationwide dial number (0809 89999) and charges Rp 160 per minute (1.5 US cents); this amount includes the telephone usage charge. The other model is a regular ISP plan to which telephone usage charges apply. The prices basically work out to be the same for both ISPs. Indonesia's Internet pricing is relatively high considering the low levels of income in the country (see Figure 5).

Figure 5: Internet dial-up tariffs

30 hours per month, US$, May 2001



Source: ITU.

Interconnections

ISPs require local, national and international connections to provide access to customers, create a national network and connect to the international network. Indonesian ISPs are allowed to have their own international connections. However, they must lease lines (primarily 2MB E1s) from the local telephone exchange to their modem banks to provide dial-up access. Several have complained about delays and the terms for leasing E1 lines from TELKOM. For example, according to one ISP, the connection charge for an E1 is Rp 13 million. The monthly subscription is Rp 13 million a month. Although TELKOM receives the local telephone charge for dial-up Internet traffic, if an ISP does not deliver a certain amount of traffic per month over the E1 line, then it must pay TELKOM the difference. POSTEL is aware of this issue but has not done anything about it.

The Indonesian ISP Association (APJII), a non-profit organization, operates a domestic traffic exchange (Indonesian Internet Exchange or IIX). Virtually all ISPs are members.[7] There are two nodes to which the ISPs connect. ISPs can connect at speeds up to Gigabit Ethernet although in practice they use far lower bandwidth. The IIX has a 100 Mbps backbone. There are no port or traffic charges; ISPs simply pay the cost of their connection to IIX. The IIX reduces the cost of international connections by keeping local

[7] According to data on APJII's web site, there were 81 members in March 2001. However according to a schematic dated November 2000, only 37 had connections to the IIX in November 2000. See www.apjii.or.id .

Internet traffic within Indonesia. In addition, several of the larger ISPs maintain private peering arrangements.

Broadband

Until recently, leased lines or VSAT have satisfied demand for fast Internet access. However these solutions have proven to be expensive and Indonesia is now turning to broadband access technologies such as ADSL and cable modem. TELKOM is conducting ADSL trials and expects to launch the service soon. TELKOM plans to install around 6'000 ADSL lines within the next year in the Jakarta area. Meanwhile INDOSAT has plans to install a wireless DSL network in Surabaya, and through its Lintasarta subsidiary, in another 15 cities.[8] The Indonesian market for fast Internet access has been estimated at 1.2 million.[9]

Currently there are four cable television companies in the country, TelkomVision, IndoVision, Indosat MegaMedia, and KabelVision. KabelVision launched its Kabelnet Internet access through cable television in Jakarta in September 1999. At the beginning of 2001, there were some 4'000 subscribers, and as of end 2002 Kabelvision has around 10,000 subscribers. TelkomVision is a joint venture between TELKOM and Alcatel supplying cable television and Internet services using a Hybrid Fibre Coax (HFC) technology Jakarta and Surabaya. Indosat MegaMedia is a subsidiary of INDOSAT and provides similar services like TelkomVision, but at this time only in Jakarta.

TELKOM also provides broadband satellite delivery through a service dubbed Turbonet. This hybrid solution downloads data at speeds up to 1.5 Mbps via the Telkom 1 satellite to an 80-centimeter antenna. Data is uploaded via a dial-up telephone connection. Bandwidth is shared depending on the number of customers. It costs around Rp 8 million per month (around US$ 700). A number of Internet cafes in remote areas are using it. For example Turbonet is using it in Sumatra, Bali, Mataram and other places where dedicated lines are not available. One drawback is that rain has an affect on the service quality.

PT Pasifik Satelit Nusantara (PSN), a satellite operator, launched PASTI in early 2001; it is almost the same as TurboNet but it is not as successful as its competitor. Some WARNETs said SAKTI's price was considered high and the services were also relatively poor.

The User's Habits

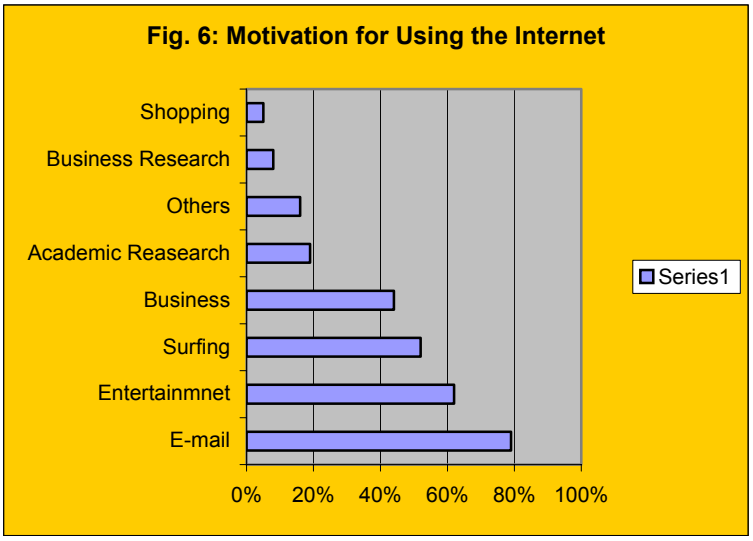
The path of the Indonesian Internet users is not as intriguing as one might think. A research conducted by APJII in cooperation with Indonesia Internet Business Community and Accenture[10] concluded that 67% of the Indonesian Internet users are influenced by their relationships. It shows that friendship, work relations and personal relationships have important roles in opening the access to the new user's habit. This is a normal path

[8] http://www.airspan.com/press/Press2001/PR13b062001.htm
[9] See Siemens. "PT.Telkom Indonesia installs DSL broadband subscriber access technology." *Press Release*. 7 November 2000.
[10] APJII, i2bc, & Accenture: *Indonesia Cyber Industry & Market*, 2001.

because the office technology advancement (19% is indeed heading toward this improvement). Mass media are also another factor which further influences people's curiosity for the Internet (10%), and education (schools) allows 4% of the population to be introduced to the cyber world.

The research also shows that people's opening to the Internet is quite recent. The largest group of the Internet users in Indonesia (40%) has used the Internet for more than 2 years. The second are those who have used the Internet between 1 and 2 years (36%). The rest are new faces who have only accessed the Internet for less than 1 year: 14% have used the Internet from 6 – 12 months, 7%]have used it from 1 – 6 months, 1% for less than a month, and 2% have no answer. Nevertheless, the length of time people have used the Internet does not bear any relation to their ability to use it.

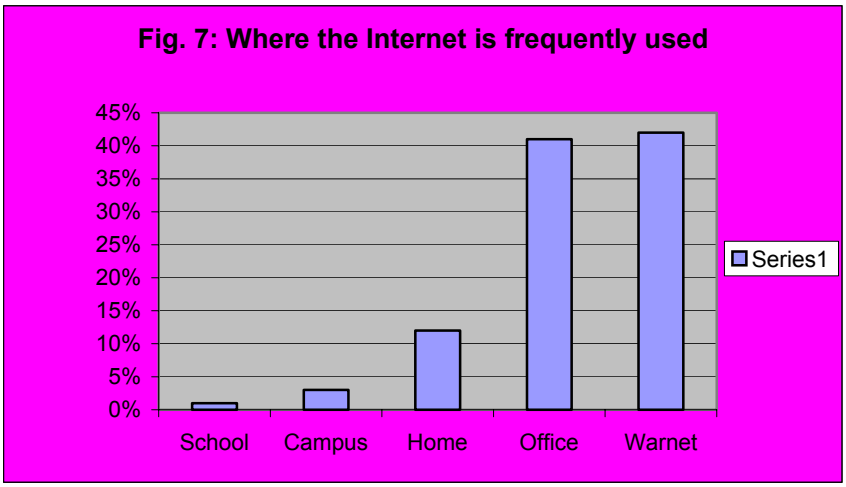
In term of motivation in using the Internet, e-mail ranks at the top in motivating the Indonesian netters to use the Internet (79%). Entertainment is in the second place with 62% users. And surfing got 52%. Among those are the users who use the Internet for business (44%). Hence, as shown in Figure 5, there are 19% of users for academic research, business research (8%), shopping (5%) and others (16%).



The research also shows that Indonesian netters have not reached the category of Internet maniacs. The majority of them are moderate surfers with a browsing frequency of 2 or 3 times a week (33%); 18% use the Internet 4 – 5 times a week. The percentage is similar with those surfing on the Internet 6 – 7 times a week (18%). There are quite a lot of those who use Internet once a week (21%) and only 10% that access more than 7 time a week.

The most common method of accessing Internet is from Internet kiosks and offices, as shown in Figure 7. This is due to the lack of infrastructure and the users' low purchasing power. This is also reflected by the length of time they spend on the Internet. Users seem to make an effort of adjusting their Internet demand with their financial capability. It is observed that only 17% spend more than 2 hours per visit. The majority are those

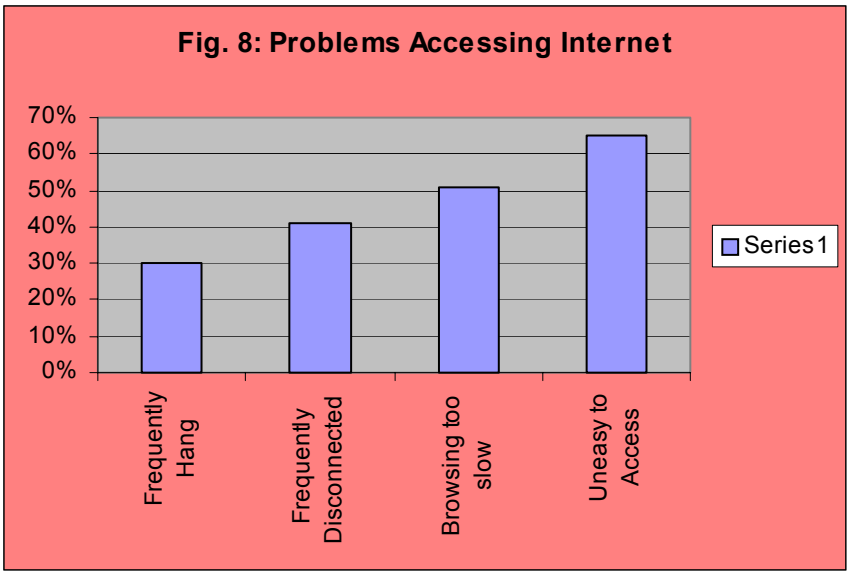
spending 1 – 2 hours per visit (47%). Second are those surfing 30 – 60 minutes per visit (22%), third is 12% of those spending 15 – 30 minutes per visit, and the rest are those who spend less than 15 minutes (1%).



Problems in Accessing Internet

Regardless of the source of the problems, around two million Internet users in Indonesia do not look as happy as their counterparts in neighbouring countries. The research indicates that only 265 Internet users state they do not have problems in accessing the Internet. The rest (47%) have problems in accessing the Internet. These problems are: frequent hang, frequent disconnection, slow browsing, and difficulties in access.

To be more specific, Figure 8 shows that there is about 65% of Internet users feel uneasy to access. Browsing too slow is the second biggest problem, at about 51%. Then about 41% of Internet users have the problem of frequent disconnection. And around 30% of Internet users complain about frequent hang while using the Internet.



Warnets

Indonesia has made impressive strides in enhancing access to the Internet over the last three years. Although the shortage of telephone lines and personal computers coupled with the low incomes restrict the possibility of individual Internet access to the Internet, local business players had made some initiatives to overcome the limitation. Two initiatives are helping to promote public Internet access. The "Warung" Internet (Warnet) are privately owned businesses that provide Internet access to the general public. The Warnets grew out of the successful previously Warung Telekomunikasi (Wartel) model, whereby private entrepreneurs resold telephone service through call centres. By May 2001, there were around 2'500 Warnets in Indonesia. There is no need for a special Internet license to operate a Warnet. Some companies are planning to franchise, giving their Warnets a common name and look.

The Indonesian Internet Kiosk Association (AWARI) is working with Warnets to do more than just provide simple Internet access. One promising area is distance education. AWARI signed a MoU with the Open University (Universitas Terbuka) for distance learning. There are some 300'000 Open University students in Indonesia; so the potential is immense. AWARI is also working with the Ministry of Education to put Internet kiosks in vocational schools. Another area is e-commerce where small businesses are already using the Warnets to exchange e-mails with customers. This could be extended to provide more sophisticated electronic capabilities such as assistance with the design of web pages hosted by Warnets, the creation of online transaction capability, etc.

Future projects include the expansion of services to rural areas. In most rural areas, dial-up access is used so applications cannot be too sophisticated. AWARI is also working to educate Warnets about broadband access. Wireless access seems promising in rural areas but the spectrum is not always available. Some Warnets are using VSAT technology and redistributing bandwidth to others over microwave links.

One complaint is that Warnets are treated just like any other customer and therefore pay the full price of telephone connection to TELKOM. They argue that they are providing and important community service and should pay a special price.

Following the increase of telephone tariffs, which was then followed by the closing of WasantaraNet (W-Net) in most cities, lots of Warnets unexpectedly had to close their services. The Indonesian Post has its own ISP called "Wasantara-net" (W-Net) <www.wasantara.net.id>. It is 60% owned by the Post Office and 40% by the Bakrie Group. It is leveraging on the network created to support the operational needs of post offices such as money orders, package tracking, financial transactions, etc.

W-Net began offering public services in May 1997. It uses VSAT to Satelindo's Palapa satellite to connect 114 post offices. Speeds range from 64 kbps in Jakarta to 128Kbps in provinces. International connection is 5 Mbps (to Stix) and 2 Mbps to local IIX. Each of on of Indonesia's 300 post offices is a potential POP, although about half (154) are currently connected. There is a plan to provide access to all post offices but the economic crisis has delayed this.

W-Net has around 20'000 subscribers (including 70 corporate). Unlike most other ISPs, 70 per cent of W-Net's subscribers are located outside Java. Despite the fact that most users are not in Jakarta, W-Net focuses on corporate and government users and not the consumer market. It advertises its service in lots of government offices but does not really focus on the consumer market.

Balai Informasi Masyarakat (BIM)

Apart from Warnets initiatives, the Indonesian ICT Society (MASTEL) had been advocating since 1997 the importance for the country to build Community Tele-service Centres (CTC) to enable people in rural areas or those who cannot afford telecommunication lines at home to get access to information. MASTEL believes that CTC could help farmers or SMEs accelerate their economy. In its initial proposal, MASTEL hoped the government would be the main funding resource in the development of CTCs. However, following the economic crisis, it seemed difficult to rely on government funding. If MASTEL wanted CTCs to develop, it was likely that this development would have to be self propelled.

In mid 2001 MASTEL turned around and changed the proposal. To make the CTC initiative come into reality, MASTEL appointed a project manager and assigned a supervision team to make a pilot project called Balai Informasi Masyarakat (BIM), a CTC in Indonesia language. After several months of survey and preparation, including finding business partners, in the first quarter of 2002 MASTEL had successfully built a BIM Pilot Project near Bandung city, in West Java. As we write this report, the Bandung BIM Pilot Project has been able to help 57 local farmers (flower growers) access market information, as well as publish their activities in the print media. See www.mastel.or.id .

E-Commerce and E-Business

Indonesia's demographic and geographic situation would appear to make it an ideal location for e-commerce. There is a large market spread over many islands. However the country's level of innovation is not currently sufficient to achieve this impact. This is borne out by other comparative studies which typically rank Indonesia at the low-end of e-commerce readiness.[11] The value of e-commerce in Indonesia has been estimated at under US$ 100 million in 2000, or less than 0.1 % of the GDP. The value of B2C e-commerce is negligible. Barriers to e-commerce development include the lack of infrastructure, awareness, security, culture and habit and the lack of online providers.[12] Another obstacle is that the computerization of a business requires a certain degree of transparency which most Indonesian companies are unaccustomed to. Yet another issue is that with such a huge population and low wages, companies prefer to use labour rather than invest in ICT.

The lack of a national Certification Authority has led to other approaches for promoting trust in electronic commerce. For example, Sucofindo <www.sucofindo.co.id>, a government-auditing agency, is reviewing a number of options for involvement in Internet-based trade. For example, it has worked with portals to be their certifying agency. This adds to security for the buyer since the site has been 'certified' by a reliable organization. Sucofindo is also in discussion with others about forming a national Certificate Authority.

Electronic Data Interchange (EDI) is being used by around 2'000 private companies and government agencies involved in retail industry and trade. One of the most intensive users is the Directorate General of Customs and Excise. The majority of import forms are computerized, resulting in much faster processing of documents. The Directorate General's website <www.beacukai.go.id> also publishes custom regulations and allows companies to download trade documentation software.

The Ministry of Justice is responsible for Intellectual Property Rights. Indonesia has a copyright law and is also a signatory to the Berne Convention. In general, foreign copyrights receive automatic protection in Indonesia but there is a lack of resources for enforcement. The country has been cited as having the third highest software piracy rate in the world, at 89% in 2000 (resulting in a loss of US$ 70 million).[13] Low incomes coupled with steep drop in the exchange rate, have driven up the cost of imported software, increasing the tendency to share applications.

The Ministry of Industry and Trade (MITI) is responsible for developing e-commerce laws covering issues such as digital signatures and computer misuse. MITI is

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[11] For example, The Economist Intelligence Unit/Pyramid Research e-readiness rankings places Indonesia 54th out of 60 countries. Of the ASEAN countries ranked, Indonesia placed ahead of only Vietnam. See http://www.ebusinessforum.com/index.asp?layout=rich_story&doc_id=367

[12] Zuraida BOERHANOEDDIN. " E-Commerce in Indonesia." http://www.isoc.org/inet2000/cdproceedings/7c/7c_3.htm

[13] Business Software Alliance. "BSA Unveils 2000 Global Software Piracy Study." *Press Release.* 21 May 2001. http://www.bsa.org/usa/press/newsreleases//2001-05-21.566.phtml

participating in the WTO e-commerce work (the country is a signatory to both the WTO ITA and Basic Telecom agreements) and following developments in UNICTRAL and OECD.

As in many developing countries, there is a lack of e-commerce awareness by Small and Medium Enterprises (SMEs). Most lack ICT skills and equipment. A number of initiatives have been designed to improve the situation. MITI has been running awareness courses. There is also a World Bank project to sensitize SMEs about ICT. The government has also offered tax rebates for the purchase of ICT equipment and liberalized foreign investment laws. The lack of business connectivity has not discouraged some SMEs from conducting business over the Internet. Many are using the popular Warnet Internet cafes to exchange e-mail with potential buyers.

Cyber laws

The lack of an e-commerce law in Indonesia means that partners use trade agreements. The status of taxes for purchases over the Internet is unclear. Authentication still requires handwritten signature. Judges do not accept electronic records as valid evidences in trials. Credit card fraud has been flourishing, but the Indonesian penal codes have yet accommodated such crime acts. To overcome all of law related problematic, recently, the government has put forward the initiative to merge two drafts of cyber laws. The first (Bill of the Utilization of IT or RUU PTI) was prepared by the University of Indonesia, and the second (Bills of Electronic Information and Electronic Transaction or RUU IETE) was done by Pajajaran University of Bandung.

The result of the merger of the two drafts will be named The Law of Information, Communication, and Electronic Transactions (UU IKTE), and according to the MCI it should be passed to the National Parliament (DPR) at the end of February 2003, leaving very little time to make it good. Some analysts say that this move, which moderated by the MCI, will most likely be ending with unsound or unreliable law, for the fact that there is not clear grand direction on what should the country do in dealing with cyber crime, and other emerging Internet applications such as e-government, e-health, e-education, etc.

In response to the comment, GIPI-ID initiated to draft a cyber crime law (TUU TIPITI). The idea came from participants of the Cyber Policy Club (CPC) meetings, which are held regularly every month as a discussion forum among many stakeholders. To make RUU TIPITI better and acceptable by DPR, GIPI-ID had agreed to draft this law jointly with the Faculty of Law, University of Indonesia, who drafted RUU IETE.

Recommendations

Presidential Decree No. 6 issued in April 2001 addresses in general terms many of the areas affecting Indonesia's ICT development. It lacks specificity about concrete steps to be taken. While the Action Plan attached to the Decree outlines actual programs, these will take some time to implement and do not go into a great deal of details. The recommendations below outline important short-term measures without major resource implications that would help enhance ICT diffusion in the country.

- **Level playing field**. There is an obvious conflict of interest when the incumbent local telephone monopoly, TELKOM, also provides Internet access. A number of ISPs have complained about problems obtaining high-speed lines from TELKOM. Whether this problem is an infrastructure constraint or of TELKOM exploiting its competitive advantage, the remedy is the same: opening up the market for the provision of domestic infrastructure. Although there are plans to open the market soon—and indeed Telkom and Indosat will already be competing in some areas—it will take a while before true competition materializes. In the meantime, it might be useful to allow ISPs to provide their own infrastructure when needed. Alternatively, the regulator could review the terms and conditions of TELKOM's leased line offerings to ISPs to try to ensure a level playing field.

- **Local applications**. The majority of Indonesian Internet use constitutes e-mail or information searching. There is not generally a lack of local content; there are a growing number of web sites in the Indonesian language. What is lacking are local applications that would generate more demand for Internet access and really help it take root in the country. There are a number of areas where application development could yield gains. One is the development of applications for rural communities. This includes the creation of agricultural portals that provide pricing information, weather forecasts, transport schedules, farming techniques and other related information. In addition to Indonesian, these applications should be developed in languages that are used in the rural areas. Programmers should work closely with the local community to find out what kind of information they need. This could be in the form of a sort of Indonesian Digital Scout or Peace Corps program where ICT-skilled youth go to rural areas to work with local communities to develop applications and train local users. While traditional web access via a PC will be important, other innovative ways of disseminating information may be appropriate. This can include relaying information downloaded from the web via photocopies or broadcasting over a local loudspeaker system or local radio. Another technique is to use audio and video streaming to create and disseminate information, particularly for illiterate or media illiterate users.

  Another area that could drive Internet awareness and usage is the development of a few 'killer' applications. These could be related to government-related services that are widely used. One example would be the local identity card that is required of every adult and typically time consuming to obtain. Allowing citizens to complete the application for the identity card online would save time, make the process more transparent and just might be the sort of thing that drives people to the Internet. Arrangements could be made with Wartels to assist users in completing the form, take

and upload digital photos and distribute the completed identification card when it is ready.

Parallel to this effort, the government might want to designate a number of 'flagship' applications and provide support for the local Research and Development community to build them. This could include help for special software centres.

The development of dot-com companies should also be facilitated. This could include tax breaks and other incentives for content creators. Dot-com incubators could also be explored, perhaps as part of the development of software development parks. Partnerships with Singapore, Brunei and Malaysia where the Malay language is used and closely-related to Indonesian, could be explored as these countries could provide expertise and resources.

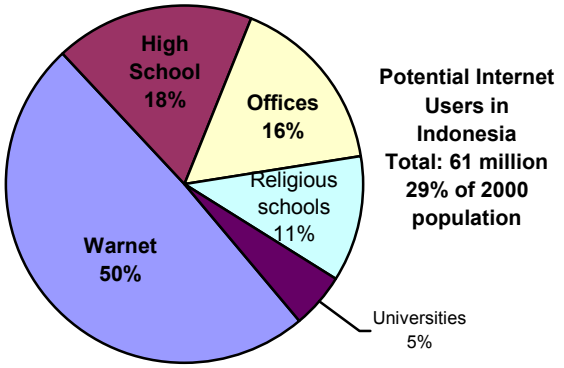
- **Flexible tariffs**. Indonesian Internet tariffs are relatively high compared to other South East Asian nations. This is exasperated by the lower incomes in Indonesia, which makes access expensive. The price of 30 hours of Internet access in Indonesia is more than twice the average monthly per capita expenditure. If Internet use is to increase, then the price of access must be reduced. One component of the dial-up Internet charge is the telephone tariff. According to one Indonesian Internet expert, if telephone tariffs were lowered, the number of Internet subscribers could reach 20 million in the country.[14] It is recommended that telephone charges for dial-up Internet access be waived or reduced. Another idea is to share the telephone charge between ISPs and Telkom. This would allow ISPs to provide 'free' Internet access. The example of Linknet's free ISP plan is pertinent here. In less than one year, Linknet acquired almost 200'000 subscribers, making it the largest ISP in the country. However this model was unsustainable since Telkom refused to share the telephone charge.

- **Universal access**. The majority of Indonesian's cannot afford individual Internet access. Additionally roughly 90% of homes do not have telephone lines or home computers. Thus if the Internet is to become widespread in the country, it will have to be through public locations. Indeed, statistics indicate that the majority of Indonesians already access the Internet from public locations such as Warnets. This has happened despite the little number of government policies supporting public Internet access. The potential for expanding Internet access through public locations such as schools or Warnets is immense. According to POSTEL, the potential size of the Internet market in Indonesia is over 60 million users (i.e., 30 per cent of the population), some 30 times higher than it is today. Most of these new users would access the Internet from schools and Warnets if the facilities were available. As a first step, the same agreement that allows Wartels to purchase wholesale airtime from TELKOM should be extended to the Warnets. This will allow them to reduce their costs and make service even more affordable. Other incentives such as tax breaks should be provided to Warnets that locate in rural or underserved areas. The government should also

[14] "ISPs Show Promising Future, As Subscriber Numbers Increase." Detikworld. 19 April 2001. http://www.detikworld.com/inet/2001/04/19/2001419-180116.shtml

deploy some of its education budget for the purchase of ICT equipment and Internet access. In addition, it should devise a universal access policy that includes discounted Internet access to schools.

Figure 9: Indonesia's Potential Net Market



Source: POSTEL, 2000.

- **Foreign investment**. The government will be hard pressed to both provide adequate social services as well as make the needed expenditures to promote ICT development. One important source of funding could be international investors that are attracted by Indonesia's large market source and potential. There is legitimate concern that opening markets too quickly might affect weaker domestic companies. However the government must resist the temptation to champion local companies over foreign ones in order to attract needed investment. It must explore ways to attract investment while ensuring widespread access.

- **Market research**. There is a serious shortage of ICT market information for Indonesia. This ranges from reliable surveys on the number of Internet users to the current ICT workforce. The national statistical agency (BPS) does not collect ICT indicators nor does the government agency responsible for telecommunications, POSTEL or MCI. Although some market research firms occasionally compile ICT-related data for the country, these are rare or expensive to obtain. Therefore information about a number of important indicators such as users, user profiles or web sites visited are based on irregular media reports that are typically limited in coverage or of questionable methodology. Thus far, the limited number of operators in the telecom sector has facilitated the aggregation of country-wide telecom statistics. However this will change as new operators enter the market. It is recommended that BPS, POSTEL, and MCI jointly develop on online ICT statistical system. This would include collection of key market indicators from telecom operators, ISPs, Dotcoms, and aggregation at a country and provincial level. It is also recommended that BPS include a number of questions about ICT equipment ownership in household surveys. It is further recommended that the government sponsor ongoing surveys to obtain ICT-related information about key sectors of the

economy such as the value of e-commerce, ICT human resource situation and requirements, ICT usage in the educational sector, etc.

March 1st, 2003
Prepared based on the following resources by:
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