Technical Report

Indonesia—Information and Communications Technologies (ICT) Assessment

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Glossary

ADT	Admission/discharge/transfer (hospital system)
AIETI	Asosiasi Industri Elektronika Telekomunikasi Industri (National Telecommunication Companies Association of Indonesia)
AED	Academy for Educational Development
AMPS	analog mobile phone systems
APEC	Asia Pacific Economic Cooperation
APJII	Asosiasi Penyelenggaran Jasa Internet Indonesia (Internet Service Providers Association of Indonesia)
APKABEL	Asosiasi Perusahaan Kabel Listrik (Electric Cable Companies Association)
APKOMINDO	Asosiasi Pengusaha Komputer Indonesia (Computer Traders Association of Indonesia)
APNATEL	Asosiasi Perusahaan Nasional Telekomunikasi (National Telecommunication Companies Association)
APNI	Asosiasi Perusahaan Nasional Informatika Indonesia (National Telecommunication Companies Association of Indonesia)
APPKAI	Asosiasi Pengembangan, Penyedia Applikasi dan Konten Indonesia (Indonesian Integrators, Applications and Content Providers Association of Indonesia)
APPWI	Asosiasi Pemasok Perangkat Wartel Indonesia (Internet Kiosks/Cafés Hardware Suppliers Association of Indonesia)
APWI	Asosiasi Pengusaha Wartel Indonesia (Telephone Kiosks Association of Indonesia)
Aspactel	Asia-Pacific Telecommunication & Information Technology Forum and Exhibition
ARPINDO	Asosiasi Penyelenggara Radio Panggil Indonesia (Pager Radio Service Providers Association of Indonesia)
ASPILUKI	Asosiasi Piranti Lunak Telematika Indonesia (Computer Software Association of Indonesia)
ASSI	Asosiasi Satelit Seluruh Indonesia (All Indonesia Satellite Association)
ASYCUDA	Automated System for Customs Data (UNCTAD)
ATM	asynchronous transport mode
ATSI	Asosiasi Telepon Seluler Indonesia (Cellular Telephone Association of Indonesia)
AWARI	Asosiasi Warnet Indonesia (Internet Kiosks/Cafés Association of Indonesia)
B2B	business to business

B2C	business to consumer
Bakosurnatal	Badan Koordinasi Survei Tanah Nasional (National Coordinating Agency for Land Surveying)
Bappenas	Badan Perencana Nasional (National Planning Agency)
BIKN	Badan Informasi dan Koordinasi Nasional (National Information and Communication Agency (formerly Ministry of Information under Suharto government)
BKPM	Badan Koordinasi Penanaman Modal (Coordinating Investment Board)
BI	business incubator
BLS	Bureau of Labor Statistics (U.S. Department of Commerce)
BTA	Basic Telecommunications Agreement (WTO)
BUMN	Badan Usaha Milik Negara (state-run enterprises)
CAGR	compound annual growth rate
CIC	community information center
CMM	capability maturity model (Software Engineering Institute)
DBMS	data base management system
Dephubtel	Departemen Perhubungan dan Telekomunikasi (Ministry of Communications and Telecommunications) formerly Dephub prior to 8/24/2000
Depperindag	Departemen Perindustrian dan Perdagangan, (Ministry of Industry and Trade, MOIT)
Dikmenjur	Direktorat Pendidikan Menengah Kejuruan, Departemen Pendidikan Nasional (Directorate of Vocational Middle-level Education, Department National of Education)
Ditjen Postel	Direktorat Jeneral Pos dan Telekomunikasi (Directorate General of Postal & Telecommunications Services)
Ditjen HAKI	Direktorat Jeneral Hak Atas Kekayaan Intelektual (Directorate General of Intellectual Property Rights)
DOC	U.S. Department of Commerce
DOT	Digital Opportunity Task Force
EDA	U.S. Department of Commerce's Economic Development Administration
EDI	electronic data interchange
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GENETIKA	Gerakan Nasional Telematika (National ICT/Telematics Movement)
GNP	Gross National Product
GOI	Government of Indonesia
GOJ	Government of Japan
GPS	global positioning systems
GSM	global system for mobile communications
IAS	International Accounting Standards
IBTCI	International Business and Technical Consultants, Inc.

ICT	information and communications technologies
IDC	International Data Corporation
IED	Internet for Economic Development
IEEE	Institute for Electronics and Electircal Engineers
IESC	International Executive Service Corps
IFC	International Finance Corporation (WB)
IMF	International Monetary Fund
IITELMIT	Indonesian International Telecommunication, Media & Information Technology, Conference & Exhibition (incorporating G-15 South-SouthTrade Expo).
INKOPWI	Induk Koperasi Penglola Warnet Indonesia (Warnet Enterpreneur Principal Cooperative)
IPO	initial public offering
IPR	intellectual property rights
ISDN	integrated services digital network
ISA	industrial sector analysis
ISO	International Standards Organization
ISP	internet service provider
IT	information technology
ITA	Information Technology Agreement (WTO)
ITAA	Information Technology Association of America
IT&C	information technology and communications
ITG	Information Technology Group at Center for International Development at Harvard University
ITU	International Telecommunications Union (UN)
JICA	Japan International Cooperation Agency
Kadin Telematika	Kamar Dagang dan Industry, KADIN, Kompartemen Telematika (Telematics Section or Compartment of the Chambers of Commerce and Industry, or Kadin)
KOPTINDO	Koperasi Telekomunikasi Indonesia (Telecommunication Cooperative of Indonesia)
KPIITI	Komisi Pengembangan Industri Informatika dan Telekomunikasi Indonesia (Informatics and Telecommunication Industrial Development Commission)
Km	kilometers
LKHT	Lembaga Kajian Hukum Teknology (Research Institute for Technology Law Studies, University of Indonesia)
Mastel	Masyarakat Telekomunikasi, Media dan Informatika or Telematika (Indonesian ICT or Telematics Society)
Menkeh HAM	Kementerian Kehakiman dan Hak-hak Azazi Manusia (Minister of Justice and Human Rights)
Menkeu	Kementrian Keuangan (Ministry of Finance, MOF)
LAN	local area network
Mbps	megabytes per second

MOC/MOCT	Ministry of Communications and Telecommunications (Departemen Perhubungan dan Telekomunikasi, Dephubtel since 8/24/2000; formerly Departemen Perhubungan or Ministry of Communications but MOC is in English official use; during the Suharto era was known as MTPT)
MOF	Ministry of Finance (Menkeu Kementerian Keuangan)
MOIT	Ministry of Industry and Trade (Departemen Perindustrian dan Perdagangan, Depperindag)
MTAC	Ministry of Tourism and Culture
MOJHR	Minister of Justice and Human Rights (Kementerian Kehakiman dan Hak-hak Azazi Manusia, Menkeh HAM)
MTPT	Ministry of Tourism, Post and Telecommunications (replaced in part by MOC in 1998)
MHz	Mega (million) Hertz (cycles/second)
NTCA	National Telephone Cooperative Association
NGO	non-government organization
ORARI	Organisasi Radio Amatir Republik Indonesia (Cellular Telephone Association of Republic of Indonesia)
PT Indosat	PT Indosat Mega Media Tbk (a limited liability company)
PT Telkom	PT Telekomunikasi Indonesia Tbk
P2TEL	Persatuan Pensiunan Telekomunikasi (Telecommunication Retired Personnel Union)
PRSSNI	Persatuan Radio Swasta Siaran Niaga Indonesia (Private Commercial Radio Broadcasting Union of Indonesia)
TKTI	Tim Koordinasi Telematika Indonesia (Indonesian Telematics Coordinating Team)
RI or ROI	Republic of Indonesia
SME	small and medium enterprise
SO	strategic objective
TRIPS	Trade Related Intellectual Property System
UNCTAD	United Nations Commission on Trade and Development
UNDP	United Nations Development Program
US	United States
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
USDOC	U.S. Department of Commerce
USG	U.S. Government
VSAT	very small aperture terminal
Warnet	Warung Internet (Internet Café/Kiosk)
Wartel	Warung telekomunikasi (Telecommunications Café/Kiosk)
WB	World Bank
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Executive Summary

This assessment of information and communications technologies (ICT) was undertaken at the request of the USAID Mission for Indonesia in Jakarta and in support of the ICT Program of USAID's Asia and Near East Bureau. This assessment has been built around the Bureau's framework of four "Ps"—***policies, pipes, private sector, and people***.

The on-the-ground ICT assessment was carried out between January 16 and February 3, 2001. The team included individuals provided through Nathan Associates in support of their private-sector activities as well through Chemonics, which is engaged in civil society activities in Indonesia. In addition, the team worked closely with the World Bank and the Government of Japan to identify and coordinate opportunities for partnering or to undertake collaborative and supporting activities.

During the time of this assessment Indonesia was recovering from severe financial and political difficulties. The political environment remains somewhat unsettled, with the financial crisis mostly resolved but with lingering effects, such as an uncertain investment climate—something that directly affects ICTs. One of the dominant political themes in Indonesia is the decentralization of political and administrative powers from Jakarta to local authorities. This will significantly change the political landscape of Indonesia over the next several years.

There is a growing consensus in Indonesia's public and private sectors that ICTs are important and hold potential for economic growth. A number of initiatives are underway in the Government of Indonesia (GOI), such as the Telematics movement, to outline and shape a wide array of ICT-related activities and there is a significant movement toward a more liberalized ICT sector with telecommunications as the main focus. A new Telecommunications Law (36/1999), still unrefined, moves the sector closer to being liberalized and market-driven, but recent controversial policies and a slow bureaucracy do not augur well for fresh investments. There is considerable attention being paid to electronic commerce (e-commerce) issues with Parliament drafting and passing related Bills—but the drafting process is not yet fully coordinated. In the private sector, ICT-related firms are small, but very dynamic and expanding. The incumbent and dominant telecommunications carrier is attempting to capture every market segment. More traditional firms are also using ICTs, with many moving onto the Internet and starting to deploy ICTs to improve internal operations, efficiencies, and gain productivity. This deployment is also a focus of USAID's development activities and has been incorporated into this assessment to identify opportunities for leveraging ICTs in the execution of USAID's international development mandate.

This assessment has identified several areas of opportunity for targeted efforts to advance a pro-ICT legal structure, strengthen the ICT sector in the Republic of Indonesia, support the development of the ICT sector in Indonesia, and expand access to the Internet into rural areas. Recommendations put forth at the end of this assessment are dominated by the need to support the Government of Indonesia's move to establish a liberalized, consistent, and predictable telecommunications sector in which there is more private sector participation and a better climate for telecommunications investment.

1. Background

During the past several years USAID has increasingly focused on information and communications technologies (ICTs) in its development activities. In the last two years one aspect of this focus has been the White House-sponsored Internet for Economic Development (IED) Initiative. The IED Initiative initially included 10 countries, but now covers 20. Indonesia was added in the summer/fall of 2000 at the request of the Asia Near East (ANE) Bureau.

USAID's growing focus on using ICTs for international development was reinforced at the G-8 Summit that took place in July 2000 in Okinawa, Japan. The issue of the growing "digital divide" resulted in an Okinawa Charter on Global Information Society. This charter launched a Digital Opportunity Task Force (DOT Force) as a first step in achieving digital access and education for all by the year 2010. A summary of the charter and the global call to action are in Appendix A.

This increased global focus is predicated largely on growing awareness of the impact that ICTs have had on the U.S. economy over this past decade. This impact has documented in a series of annual reports prepared by the U.S. Department of Commerce, most recently in "Digital Economy 2000, " released in June 2000. A summary of this report is in Appendix B.

ASIA AND NEAR EAST ICT PROGRAM

This assessment has been undertaken in support of the ANE Bureau's Information and Communication Technology program. A copy of a recent two-page summary of the program is in Appendix C. As reflected in the Bureau's recent program description

> Across Asia and the Near East region, Internet and E-Commerce is an emerging reality, but there are a number of key impediments to make it an everyday business practice. As the US Government recognizes the critical need for its partner countries to be engaged in the Internet and E-Commerce development, the ANE Bureau has adopted a 4 "P" approach to successful Internet Deployment: (1) Policy, (2) Pipes, (3) Private Sector, and (4) People.

Each of these is detailed in the ANE Information and Communication Technology program as follows:

Policy – Opening doors through policy reform to permit the introduction and growth of information and communications technologies, reducing barriers to open connectivity, and ensuring that global electronic commerce can take place in an open and transparent fashion.

Pipes – Demonstrating the effectiveness of appropriate hardware and software by utilizing the latest technology such as wireless, high speed data transfer, secure transaction capability, extending the Internet to underserved areas, and working with private sector Internet Service Providers to offer a range of services to clients.

Private Sector – Ensuring the private sector "can do what it needs to do to be successful." This entails combining "Policy" reforms and "Pipes" improvement with ensuring there are sufficient, well trained technicians to support the build-out of ICT industries.

People – Implementing new approaches to sustainable social and economic development through Information and Communication Technology tools. It is critical to the success of the program that USAID's partners use the Internet and other ICTs as tools for development.

The goal this new ICT program is "is to have all ANE Missions promoting one or more of the '4-Ps' within their development portfolio."

ICT ASSESSMENT FOR INDONESIA

In December of 2000, Jonathan Metzger, ANE's Internet Development Adviser, visited the USAID/Jakarta Mission and laid the foundation for this assessment, which was undertaken in direct support of the ANE Bureau's ICT program and in direct consultation with Mission personnel between January 16 and February 3, 2001. The assessment team consisted of four personnel who support two of the Mission's key initiatives. Three team members from Nathan Associates support private sector initiatives, and one from Chemonics supports Civil Society activities. This team was provided a unique opportunity to gain insight into Indonesia's ICT environment and to explore deploying ICTs across the Mission portfolio. The team also explored the potential for partnering or undertaking complementary ICT-related activities with the World Bank and the Government of Japan (GOJ). The possibility of USAID/Jakarta undertaking ICT initiatives that are complementary and connected with current and planned World Bank and GOJ initiatives was discussed during Mr. Metzger's visits and subsequently in Washington D.C., and within the context of this assessment. In addition to ANE's "4-P" framework, the following ICT assessment approaches have been taken into account:

A readiness assessment covering several countries, including Indonesia, recently published by McConnell International[2].

Readiness for the Networked World by the Information Technology Group (ITG) at the Center for International Development at Harvard University[3].

Appendix D contains more information on these tools, including a preliminary assessment based on the ITG Readiness Guide.

Recommendations were offered in preliminary form to Mission staff, then discussed briefly with key staff and refined. Further discussion and refinement is expected to ensure the detailing, design, and implementation of recommendations that best fit and contribute to USAID/Jakarta's program priorities. Several of these hold potential for collaboration between the USAID/Jakarta Mission, the Republic of Indonesia, the World Bank, and the Government of Japan.

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[2] http://www.mcconnellinternational.com

[3] http://www.readinessguide.org

2. Policies

The first critical component in this assessment is the Republic of Indonesia's (ROI's) position on ICTs. This chapter focuses on the Government's policy and legal framework for

Telecommunications, especially with respect to expanding the role of the private sector and ensuring a fair, open, competitive, and predictable marketplace; and

E-commerce, specifically facilitating use of the Internet in conducting commercial and business transactions.

SUMMARY

In recent years, the GOI has moved toward a more liberalized telecommunications environment. The Telecommunications Law of 1989 (3/1989) outlined a direction for privatizing state telecommunications and allowing participation of the private sector. Under this law new entrants were allowed to enter the local market under several different relationships with the incumbent, PT Telkom. Five regional operators have subsequently entered this market under joint-venture agreements (referred to as KSOs). In addition, seven mobile-wireless operators have entered the domestic market, again with one of several agreements with the incumbent PT Telkom.

Findings: Telecom Policies

- New 36/1999 Telecom Law
- Few in implementing rules, regulations, and decrees
- Current telecom environment uncertain, but moving in right direction
- No Independent Regulator
- PT Telkom & KSO issues unresolved—situation stalling telecom expansion
- Government pricing controls on rates
- USAID engaged in telecom policy/ regulatory area
- Open entry into ISP market but the incumbent carrier is stalking the market

Unfortunately after this market entry Indonesia experienced financial and currency crises that have had a very significant impact on the financial viability of these firms. To this day, unresolved issues between PT Telkom and the KSOs pose some of the most significant constraints on basic infrastructure expansion.

A new Telecommunications Law of 1999 (36/1999) takes market liberalization even further. Among other things, the law shortens the monopoly period of its dominant domestic and international providers (PT Telkom and PT Indosat), with each allowed to enter the other's market as early as 2003. The law was passed in the fall of 1999 but to be effective in the fall of 2000 the details needed for a consistent and predictable telecommunications environment must be articulated through a significant amount of rulemaking, regulation, and decrees. At the time of this assessment it was estimated that approximately 20 telecommunications-related decrees were still under discussion, including critical rulings on interconnection pricing, satellites, and wireless LAN frequencies. The law is minimal, so the blanks must be "filled in" and delays can slow much needed expansion of

telecommunications in Indonesia and can threaten the buoyant expansion of the Internet service providers and associated IT businesses.

Support and optimism for an independent telecommunications regulator varies. Currently the Ministry of Communications (MOC) is responsible, with the recognition that in an environment where the legislation basically outlines the framework, and others fill in the subsequent details, the dominant operator has ample opportunity to define many pseudo-policies, regulations, etc., simply by operations. To speed the process by which a stable and predictable telecommunications environment is established in Indonesia this area needs special attention—through expanded awareness and education on the part of key decision makers (GOI and Parliament); improved and expanded skills and knowledge among those responsible for working out the implementing rules, regulations, decrees, and administrative procedures; and ideally, establishment of an independent regulator with supporting facilities such as spectrum management.

E-commerce in Indonesia faces technical, cultural and legal barriers. Indonesia is a cash-based society and paper transactions are the dominant mode of conducting commerce. There is widespread distrust in the security, integrity, reliability, and enforceability of electronic transactions, arising from a number of factors—some real and some imagined. Generally, the success of e-commerce depends on a predictable and flexible legal and regulatory framework applicable to e-commerce issues. In Indonesia, there is a need for law and administrative reform to provide a sense of certainty and trust for businesses and individuals who seek to engage in e-commerce, and to create an environment that will facilitate, support, and promote e-commerce in Indonesia. Promulgation of appropriate laws will catalyze e-commerce in Indonesia and send a message that Indonesia is moving forward in the ICT marketplace. The current pace of e-commerce on an international scale will also force countries like Indonesia to accelerate its transition from a paper-based commercial market to a market that includes a substantial e-commerce.

Findings: E-Commerce Policies

- B2B—uninhibited by lack of legal framework for e-commerce
- B2C—low user confidence because of uncertain security, enforcement, electronic transaction integrity, and consumer protection
- No shared national vision and policy framework
- Some laws are being put in place without framework and with little or no public engagement
- What is being put in place is in consideration of ASEAN, APEC, and the UNCITRAL model
- Signatory to WTO/TRIPS, but short on enforcement

Indonesia should take a proactive approach in successful deployment of e-commerce and remove all existing barriers to e-commerce. First, clear direction and guidelines must come from the highest level of the Indonesian government. There must be a coordinated approach among all the relevant ministries to draft e-commerce laws. Reform in the commercial legal regulatory environment should be government-led but market-driven. E-commerce legislation must address security in electronic transactions, privacy, intellectual property rights piracy, taxation and customs, consumer protection, arbitration, content and computer-related crimes. Legal reform will not in itself result in a flourishing e-commerce climate. Traditional ways of conducting business transactions must also change, which will require a shift in the cultural perspective of viable markets.

TELECOMMUNICATIONS

Telecommunications Law 3/1989 provides the foundational statute for Indonesia's telecommunications framework. Since its passage the law has been supported by subsequent presidential and ministerial decrees that combine to form the legal framework for the telecom sector. And, while this law has most recently been replaced by a new Telecommunications Law 36/1999, it remains the dominant policy instrument shaping the sector.

The primary purpose of the 1989 Telecommunications Law was to open the telecom sector to limited private-sector participation. This was accomplished by designating the state-owed PT Telkom and PT Indosat as "organizing bodies" with delegated authority and responsibility to organize and provide telecommunications infrastructure and services. PT Telkom was designated as the domestic organizing body and PT Indosat as the international organizing body. By the then Ministry of Trade, Post and Telecommunications (MTPT, now MOC) Decree 61/1995, PT Telkom's exclusivity was confirmed as late as 1995. A similar MTPT Decree 77/1991 confirmed PT Indosat's exclusivity.

Taking effect on January 1, 1996, the MTPT granted PT Telkom the exclusive right to provide local fixed line and fixed wireless telecommunications services nationwide (including those offered through joint operating schemes) for a period of 15 years. PT Telkom's domestic long distance exclusivity was granted for a minimum of 10 years—effective from the same date.

With respect to engaging the private sector, the 1989 Telecommunications Law made a clear distinction between "basic services" and "non-basic services." Basic services involve the delivery of information between sender and receiver without processing or modification, and include such services as

- Local and domestic long distance,
- Telephone,
- Mobile cellular,
- Fixed wireless,
- Leased lines,
- Packet switched data,
- Telex and telegraph,
- VSAT, and
- Telecast.

Non-basic services consist of

- Electronic mail,
- Store and forward facsimile,
- Abbreviated dial,
- Multi-call address,
- Electronic data interchange,
- Paging, and
- Video conferencing.

This basic/non-basic service designation is fundamental to the degree to which the two state-owned organizing bodies are engaged relative to other private sector participants. In summary, based on the Telecommunications Law, private companies can offer only basic telecommunications

services with direct or indirect cooperation with the organizing body (e.g., PT Telkom) and pursuant to obtaining a license from the MOC. The forms of cooperation between the private firm and PT Telkom are defined in the Telecommunications Law as being permissible only when in the form of

Joint venture companies in which the organizing body has a direct or indirect equity position;

Joint operating schemes (such as PBHs or KSOs); or

Management contracts. For non-basic services the private sector may operate without any such cooperation with the organizing body, but still must obtain a license from MTPT.

This places PT Telkom in a partial ownership, partial operating, or partnering arrangement with every provider of basic telecommunications services in Indonesia. This includes landlines, local and long distance, cellular (fixed and mobile), packet-switched networks, Satellite/VSAT-based networks, etc. In fact, PT Telkom frequently competes against itself in establishing relationships with private-sector firms that provide competing services in a given geographic area. While basic services do not include such Internet, video conferencing, paging, and others, the Telecommunications Law does not restrict the organizing body from also providing such services. PT Telkom only requires a license from MOC to provide these services if radio frequencies are needed.

While private-sector firms are not required in theory to have ownership, operating, or management relationships with PT Telkom when providing non-basic services (e.g., Internet and other value-added services), they must still rely on PT Telkom's infrastructure to provide their services. These relationships would most likely be put into place via contracts for leased lines, capacity, etc. In addition to the non-basic exception to PT Telkom's exclusivity, private networks (e.g., those for use wholly within a single company) may be put into place without formal cooperation with PT Telkom as described in the Telecommunications Law of 1989. But in most cases here too there is a dependence on acquiring some level of services from PT Telkom under contract arrangements.

Through the MOC, the Government of Indonesia develops and administers the telecommunications industry in Indonesia. The government is responsible for administrative and policy-setting authority, including the formulation of regulatory and technical policies. But pursuant to the Telecommunications Law and the rules, regulations, and degrees promulgated thereunder, a certain level of regulatory authority has been delegated to the two state-owned companies who organize domestic and international telecommunications services (PT Telkom and PT Indosat). The MOC supervises and regulates their provisioning of telecommunications services as follows:

The Directorate General of Posts and Telecommunications supervises the directorates of telecommunications frequency management and standardization.

The Planning Bureau sets tariffs.

The Law and Organization Bureau establishes regulations.

Typically these bureaus consult with PT Telkom and PT Indosat before making recommendations to the Secretary General of the MOC. In addition, major policy and management decisions by PT Telkom and PT Indosat which affect national telecommunications development require MOC approval and as such MOC is included in consultations before changes are put into effect.

Initially wholly owned by the Government of Indonesia, both PT Telkom and PT Indosat have been partially sold off. At present the GOI owns 75 percent of PT Telkom and 65 percent of PT Indosat. Sales were placed through the equity markets with proceeds being placed in the GOI treasury. The GOI holds their interests through the Ministry of Finance (MOF).

Current Dynamics

In 1999, a new Telecommunications Law (36/1999) was enacted, replacing the 1989 Law and setting a foundation for an even more liberalized telecommunications sector. This law replaced the foundational "basic services" and "non-basic services" with a "network provider" and "service provider" designation. Network providers are firms that provide infrastructure. Service providers are firms that provide value-added services over this infrastructure. The new law also supports Indonesia's commitments made in 1997 with respect to WTO's Basic Telecommunications Agreement (BTA). It also links the Telecommunications Law with the Anti-Monopoly Law. According to the December 2000 Asia-Pacific ITU report[4], this legislation will shorten PT Indosat's exclusivity for providing international services to August 2003. Under this agreement, PT Indosat, along with others (i.e. new entrants), will be allowed to offer domestic services (local and domestic long distance services) beginning in August of 2003. PT Telkom, also along with others, will be able to enter the international long distance market. An article in *The Jakarta Post* in May 2000 places this date as early as 2002[5]. Exactly how the sector will be restructured, especially with respect to PT Telkom and PT Indosat, is still unknown.[6]

While considerable implementation has taken place in this last year since the law was passed, much work remains to be done. One key element that appears to be unresolved is the establishment and role of an independent telecommunications regulatory. Whereas the law itself refers repeatedly to statutory laws, government regulations, etc., there is no such formal regulatory body. There is however a growing call for the establishment of such as body as evidenced by two recent articles in *The Observer*[7] and *The Jakarta Post*[8].

Even though an independent regulator has not been established, implementation of the 1999 Telecommunications Law has continued through 2000, with intended schedules of key implementing activities reflected in two IMF Letters of Intent—one issued in January 2000, and the other in May 2000. These activities include adopting new tariff and interconnection policies, restricting cross ownership between PT Telkom and PT Indosat, and promoting more competition between PT Telkom and PT Indosat.

It should be noted that USAID, through its current Partnership for Economic Growth (PEG) activities is providing valuable policy-related support to the Ministry of Industry and Trade on

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[4] Asia-Pacific Telecommunication Indicators 2000. ITU. Geneva. 3 December 2000. pgs. 14-15.

[5] Government to open up telecom sector by 2002. *The Jakarta Post*. Wednesday, May 31, 2000.

[6] Indonesia Is Advancing Telecom Restructuring. *The Asian Wall Street Journal*. Wednesday, June 7, 2000.

[7] Govt says RI needs telecoms regulators. *Observer*. Monday, December 18, 2000.

[8] Mastel urges govt to form regulatory committee. *The Jakarta Post*. December 19 2000.

telecommunications issues. Recent suggestions to the Ministry for continued support in this area include (1) industry restructuring, (2) SME development, (3) interconnection, (4) independent regulator, (5) universal service, and (6) information technology.

Analysis

The Telecommunications Law (UU No. 36/1999) calls for introducing competition into the local market beyond what now exists at the level of telecommunications carriers. This is supposed to affect competition in all segments of ICT, including basic services fixed line telephony, cellular phones, ISPs, broadband, satellite or wireless transmission and other telecommunications services as well as software houses. Mechanisms administered by institutions such as an independent regulatory body (IRB) could 'contain' PT Telkom from an excessively dominant position in each market segment where it already has significant presence. Currently the only effective competition is offered by the duopoly with PT Indosat with its own backbone. Nevertheless, given the current investment climate, the establishment of a credible duopoly of PT Indosat with a foreign joint-venture partner appears unlikely to be realized this year.

Industry players and observers differ on the timing of the establishment of an IRB but some say that it might take at least two years and is facing some resistance from MOCT and other sections of the government. Further development of the regulatory framework, particularly the implementation of the Telecommunication Act UU No. 36/1999 is urgently needed, as follows:

The frequency spectrum management and wireless local area network (LAN) which is covered under the Presidential Decree PP No. 52/2000.

The determination of new tariffs and interconnection prices (covered under the regulation PP No. 53/2000) not just for public switch telephone network (PSTN) managed by PT Telkom but also for cellular and airtime services (dot.net 13, 01/ 9/01); however, there are delays on both of these as the MOC is yet to sign the draft Ministerial Decrees (RKM) that outline how the PP No 52 and 53 will be implement.

The uncertainty of the 'cyber' legal framework is impeding e-commerce and the development of ICT. In particular PP No. 52/2000 suggests that the Government intends to impose restrictive regulations (and require licensing) on intranet, internet, voice over internet protocol (VOIP), data communications, video conferencing, video entertainment and other multimedia resale. As for legal issues, a number of reforms are needed to reduce the friction for e-commerce such as digital signature, intellectual property protection, privacy protection, tax simplification, etc.

GOI had not yet resolved its ownership of PT Telkom and PT Indosat by the end of February 2001 but PT Telkom's proposal to buy out the Government's share in PT Indosat was rejected on the grounds that it would provide the former with greater monopoly power. Such an outcome is out of line with the Blueprint of the Telecommunication Industry. The two companies are scheduled to be full telecommunication service provider by 2003.

Resolution of the Joint Operation Schemes (KSOs) between PT Telkom and foreign operators: A recent research by ABN-AMRO (which was appointed by PT Aria West to carry out the valuation) suggests that if PT Telkom takes the buy out option then it has to inject US$ 3.18 billion (for the

combined assets of all KSO operators) which it would find difficulties in raising. The government, PT Telkom and the other four consortiums have appointed their own research group to provide their own different estimates such that it is difficult for the respective parties to come to an agreement. However, ABN-AMRO suggested that a new joint-venture scheme could be established which would spin off PT Telkom's assets with those of its KSO partners but PT Telkom would end up becoming a minority shareholder in each case. While such an outcome now might seems unlikely to be acceptable to PT Telkom (since it would stand to loose its control over the networks and its lucrative revenues), ABN-AMRO suggests that this would be an attractive proposition to foreign and local investors (*Bisnis Indonesia* 02/09/01).

Without resolution of urgent issues in telecommunication infrastructure, basic and value added services cannot be improved or in turn improve local economies and the competitiveness of local businesses.

Both PT Telkom and GOI must consider FDI policy in the long-term context because KSO joint-ventures are long-term propositions. The relationship between PT Telkom and the five KSO joint-ventures—to build fixed-line expansion programs in various regions of Indonesia to increase tele-density levels—have further deteriorated since the first quarter of 2000, when PT Telkom re-evaluated their network development work (*Bisnis Indonesia* 02/1/01). The KSOs agreed in 1995 with agreement which stipulated that these companies will build and operate their units for 15 years from January 1996 until December 2010.

From PT Telkom's viewpoint, the KSOs are becoming a heavy financial load because of the debt burden under the MOU in 'sharing pain' signed in June 1998 involving 1.2 million lines. The foreign partners in KSOs have been accused of not injecting new capital and are not engaging in know-how transfer. On the other hand, KSO foreign partners charged that they are now no longer financially viable after the 1997-8 Crisis and that PT Telkom has breached the initial agreement.

Amidst the controversy, there are only two options open to the whole KSO project: to go ahead (and PT Telkom will find it difficult to raise $ 4.5 m compensation to KSO firms in the current climate) or to stop the projects and pay compensations to the foreign and domestic partners. However, both are difficult options for PT Telkom as well as the foreign operators but PT Telkom appears to have the dominant position in the subsequent negotiations. According to KSO operators, they would like to see a long term solutions to the development of the KSOs and assert that PT Telkom is only offering short tem concessions.

COMMERCE/E-COMMERCE

Electronic commerce (e-commerce) adds a completely new dimension to the traditional commercial law and policy framework of a country. Although perhaps extreme, one viewpoint actually characterizes e-commerce as the "dehumanization of business relations." More moderately stated, it is certainly true that a significant difference between e-commerce and traditional commerce is the fact that electronic transactions are far more impersonal and automated than are transactions made between people in-person, say in a departmental store, at a bank, or even over the telephone. This alteration of traditional business relationships, combined with accompanying increased opportunity

for fraud and abuse using the underlying technology, creates a natural sense of caution when participating in e-commerce transactions.

Consequently, to build trust in this new form of doing business and to advance the level of acceptance among businesses and consumers, governmental entities and the private sector must develop effective policies to overcome real and perceived risks to businesses and consumers engaging in electronic transactions. Issues that can cripple e-commerce activity in a country are the accountability and reliability of electronic transactions, the legal validity of electronic transactions, the security and integrity of electronic networks, the privacy of electronic communication and personal information, and fraud in distance selling of products and services. Individuals and businesses will more readily engage in electronic transactions if they are confident that their transactions will be as valid as traditional transactions, if there are fewer legal uncertainties, and if the electronic environment is no less secure than the traditional commercial environment. This is precisely why a transparent, predictable, and secure legal environment that establishes ground rules on national and international levels is vital to the growth of e-commerce. For what is known as the business-to-business type of e-commerce, additionally, an open, liberal, and stable business investment environment is essential.

E-commerce raises legal issues and challenges that may not fall squarely within the traditional framework of commercial law. Traditional commercial laws were conceived before the advent of advanced electronic communications systems, and are designed for trade in tangible goods. In contrast, e-commerce tends to accentuate the intangible aspects of commerce. This may call for the creation of a new legal paradigm, either by amending the legal framework or by creating an entirely new framework that addresses issues unique to e-commerce—the validity of electronic transactions, admissibility of electronic evidence, electronic signatures, certification authorities, privacy protection, intellectual property rights and domain names, consumer protection, customs and taxation, and alternate dispute resolution.

In Indonesia, the e-commerce market is fairly small and undeveloped. Its difficulties are readily apparent and may have more to do with traditional ways of conducting business than with legal barriers. Arguably, nothing legally prevents businesses or individuals from engaging in e-commerce. There is, however, a widespread lack of trust and confidence in the security, integrity, reliability, and enforceability of electronic transactions, arising from a number of factors—some real and some imagined.

Barriers to e-commerce exist because Indonesia is a cash-based society and paper transactions are the dominant mode of conducting commerce. For instance, only 1.5 percent of Indonesians own and use credit cards. And Indonesian credit cards function differently from those in the United States. For instance, in Indonesia a credit card holder faces unlimited liability in the event of a third party's unauthorized use of the card. In the United States, liability is capped at a modest US$ 50, assuming the cardholder has not abetted fraudulent third-party use. In Indonesia credit card limits are very low and interest rates so high as to be usurious, and local credit card providers generally impose additional charges from 4 to 8 percent of the purchase price for using credit cards. Catalog shopping is virtually non-existent and e-banking is nascent. In addition, approximately 1.6 percent of the population holds debit cards (ATMs). The few business web sites that exist permit the selection of goods electronically, through e-mail or fax, but payments are made traditionally, that is, offline.

Indonesia lacks a government-articulated national vision and strategy for the successful deployment of e-commerce. Specifically inhibiting the development of e-commerce in Indonesia are the following:

Security concerns, such as ensuring safe and secure electronic payments and the protection of confidential data.

Lack of predictable legal and regulatory framework that recognizes, facilitates, and enforces electronic transaction.

Lack of telecommunications infrastructure, low telephone and computer penetration, few Internet users, and the prohibitively high cost of Internet access.

Lack of interest and awareness. Indonesians, especially SMEs, have not aggressively pursued new market opportunities presented by e-commerce. E-commerce is a low priority for many businesses because they are uncertain about short-term tangible benefits that would justify cost and investment or they regard e-commerce as a distant opportunity rather than an urgent need. They are unaware of either the growing momentum of e-commerce or how it could affect the competitiveness and viability on their businesses.

Lack of resources—capital investment or skilled labor—to adequately implement e-commerce.

Lack of local content.

Poor distribution systems such as the post, couriers etc.

Lack of incentives for private sector to invest in and develop the ICT sector.

It will therefore take time for e-commerce to develop in Indonesia. Global forces, however, will force the country to accelerate its transition from a paper-based commercial market to a market that includes a substantial amount of e-commerce. It is estimated that global e-commerce could exceed $7 trillion by the year 2004. Indonesia must take swift action to avail itself of the opportunities afforded by the ICT marketplace or face the prospect of being left out of this new and profitable global market. Indonesia should, therefore, take a proactive approach to deploy e-commerce and remove all barriers to it. Specifically, the Government of Indonesia, with private sector participation, must formulate policies that build trust and establish ground rules that instill confidence and direction to the users of electronic transactions. Legal reform alone will not result in a flourishing e-commerce climate. Traditional ways of conducting business transactions must also change, and this will require a shift in the cultural perspective of viable markets.

This assessment of Indonesia’s legal and regulatory framework surveys commercial legal regulation that directly affects e-commerce, identifies legal constraints, and recommends legislative interventions to eliminate barriers to e-commerce and to ensure that Indonesian business has the opportunity to be at the forefront of e-commerce internationally. The assessment concentrates on areas where the law governing e-commerce may differ from the law governing traditional commerce. The recommendations arose from meetings held in Jakarta with representatives of Indonesia’s private and public sectors from January 15 through January 26, 2001.

Findings

Is a framework of e-commerce law necessary in Indonesia? The prevailing opinion is that Indonesia should promulgate laws that address the security and enforceability of electronic transactions. Doing so will catalyze e-commerce in Indonesia and indicate that Indonesia is moving forward in the ICT marketplace. And others believe that existing laws and regulations must be amended or supplemented by presidential and ministerial decrees as necessary to address e-commerce issues.

Opinions also differ as to which institution should prepare a framework of draft 'cyber law.' Several ministries assert primary authority in this area—the Ministry of Industry and Trade (MOIT), the Ministry of Tourism and Culture (MTAC), the Ministry of Communications (MOC), and the Ministry of Justice and Human Rights (MOJHR). Reportedly, there is little coordination or exchange of information among the ministries, each of which has contracted different universities to prepare a draft cyber law. The two universities involved in research and drafting of aspects of cyber law are the University of Indonesia (UOI) and the University of Padjajaran (UOP). The Directorate General of Domestic Trade under the MOIT has initiated the development of electronic transactions and digital signature acts. At the request of MOIT, the University of Indonesia prepared an academic paper in October 2000, titled "Indonesian Legal Framework for Electronic Transactions and Electronic Signatures," which has been submitted to Bappenas (Badan Perencanaan Pembangunan Nasional) for review. Reportedly, the Institute of Technology in Bandung (ITB) has also prepared a comprehensive paper on IT laws in Indonesia.

In 1999, UOI established the Research Institute for Technology Law Studies (LKHT – Lembaga Kajian Hukum Teknologi), which undertakes research and feasibility studies on law-related aspects of technology development and provides academic guidance to the Government in policymaking and socialization of laws. Reportedly, LKHT has on-going collaboration with MOIT, DGIP, BPHN (council to develop national laws), Bappenas, Tim Koordinasi Telematika Indonesia (TKTI, Indonesian Telematics Coordinating Team - legal issues task force), MASTEL, and KADIN. Last year, UOI introduced several courses on aspects of cyber law into its curricula and established an IPRs clinic to facilitate the filing and obtaining of IPRs and the socialization of IP laws in Indonesia. The IPRs clinic is partly funded by the BPPT. LKHT has created two web sites (www.indocyberlaw.net and www.HAKI.net) to encourage public discussion and interaction on cutting edge issues. LKHT does not have sufficient funds or human resources to extend its scope of activities.

The implementation of e-commerce requires a coordinated national effort at the highest levels of government. By a presidential decree in 2000 (No. 50/2000), GOI established Telematics Coordinating Team to support the development of e-commerce infrastructure and coordinate the formulation of national policies (TKTI is a high-level interministerial coordinating team; see Appendix E). But the secretariat to TKTI does not have the capacity to implement the policy decisions and recommendations of its task force groups. For proper coordination and implementation of TKTI's recommendations and policy decisions, the secretariat must be strengthened. Last year, GOI proposed to establish an Electronic Commerce Working Group by the Directorate General of Domestic Trade, that would consist of representatives from government institutions, private sectors, IT experts, and other such parties. Several private sector and professional associations—KADIN, MASTEL, and the Indonesian Intellectual Property Society (IIPS)—also seem to have an agenda for

the development of a legal and regulatory framework for e-commerce in Indonesia but there is no coordination between these associations.

At an e-commerce policy roundtable organized by the Asia Foundation in March 2000, the then Minister for Industry and Trade stated the importance of having the right policy to help create a healthy e-commerce industry. The Ministry recognizes its role as facilitator rather than a regulator. The Government of Indonesia is considering appointing BSN (the National Standardization Agency of Indonesia) to establish a framework for national certification authority to issue e-commerce digital certificates in Indonesia. Meanwhile, the incumbent PT Telkom (www.i-trustonline.com) has already set up a certification authority (CA); the private sector may also setting up its own CAs; PT Secure Agradi is reportedly developing a CA in collaboration with two U.S. companies, Verisign, Inc. and Cyber Trust, Inc.; and Telkom and Indosat have also undertaken similar activities.

GOI has directed the Indonesian Network Information Center (www.idnic.net.id) to administer local Internet domain name (DN) registrations in Indonesia. Evidently, DN registrations have surged from 87 in 1995 to more than 9,318 as of February 2001. That applicants should obtain government approval before obtaining domain names should be avoided in policy formulation but the present situation is not satisfactory because the legal standing of DNs registered with IDNIC is unclear. Several private sector initiatives are underway to launch secure electronic payment systems to support e-commerce in Indonesia. The management of IDNIC also expressed concern about the lack of funding and training needed to improve capacity to deal with cyber crime in Indonesian. They are helping establish an Indonesian Emergency Response Team with guidelines and organizational structure based on the experiences of the System Administration System and Computer Emergency Response Team (United States) and AuCERT (Australia) and are appealing for foreign assistance and cooperation for this critical pillar of the ICT structure.

DN administration is of some concern to many members of Mastel and the private-based initiatives such at the National Telematics Movement (Genetika) because INDIC is not formally linked with an industry-wide organization nor legally part of a government authority. “Cyber squatting” has become an international issue and growing computer crime in Indonesia —such as web site defacing or alterations, credit card fraud, and non-delivery and non-payment— underscores the need for an adequate legal framework for DNs.

For e-commerce to become a reality in Indonesia, the GOI must coordinate activities among its ministries. Then, with private sector participation, it must formulate policies that build trust and establish ground rules that instill confidence and direction for the users of electronic transactions. In addition, the legal and regulatory framework should aim to improve the telecommunications infrastructure.

Indonesia’s entry into the digital era has been slowed by economic and political circumstances. Indonesia is now implementing extensive governmental decentralization that will significantly affect the country’s commercial legal and regulatory environment. The potential of e-commerce in Indonesia is closely linked to the country’s economic growth in the near term.

For aggressive investment in the ICT sector and the development of e-commerce in Indonesia, the overall commercial legal and regulatory environment must be predictable and business-friendly. Indonesia’s commercial legal framework imposes constraints on private sector activities. For example, there is no incentive for private sector investment in the software for the ICT sector, and technology and intellectual property protection is very weak and inadequate, with software piracy

rampant in the local market. The process for company registration is cumbersome and time-consuming. The notary system between the government and the public is of questionable efficiency, and there are many barriers to entry into and exit from the Indonesian market, including ceilings on foreign equity ownership and weak bankruptcy laws. Foreign investment is regulated by BKPM (the Coordinating Investment Board) and certain sectors of the economy (set out on a "Negative List") are reserved exclusively for local investors. The Jakarta Stock Exchange (JSX) has very rigid requirements for the listing of Internet companies. The 1995 Capital Market Law does, however, provide a framework for financing issues for e-commerce companies, and allows for online trading. A new Antimonopoly Law (No.5/1999) enacted in 1999 prohibits monopolistic and unfair business practices. Another recent law relating to consumer protection became effective in April 2000. It remains to be seen whether and how the two laws will apply to e-commerce. The new Telecommunications Law (No. 36/1999) has limited provisions dealing with unauthorized access to networks, such as hacking. Reportedly, a new law (UU No. 25/2000, section 12) generally directs the state-run enterprises (BUMN) to provide public facilities and to develop strategic assets and other areas not developed by private enterprises and cooperatives. Until clarified by supplementing regulations, the application of this law to the ICT sector remains unclear. This is true for many other laws enacted in the recent years but their implementation is not clear because of a lack of supplementing regulation. Implementation and enforcement problems are due to weak institutional infrastructure and capability. Another significant impediment is the lack of public access to rules and regulations because the law does not require that the rules and regulations be published in order to take effect.

Indonesian laws and policy are formulated without input from the public or the private sector. In mid-August 2000, the President issued a decree (No. 96/2000) banning all new foreign investment in the multimedia industry, such as Internet service providers (ISPs), portals, e-commerce services, and "dot-com" companies based on the rationale that "local players need more space to develop their businesses." Two weeks later, after much protest, another presidential decree (No. 118/2000) reversed this decree. The ruling signals the Government's view of "an unregulated industry being a danger" and a broader set of problems, including lack of any public-private sector partnership. This event has, however, provided a catalyst for the private sector to unite and lobby the Government for a voice in policy formulation.

Administrative impediments to business and investment in Indonesia include unnecessary bureaucracy, complex government regulation, customs delays, high market-entry transaction costs, and overburdened courts. To improve Indonesia's business and investment climate, "fast track" procedures for effective and efficient dispute settlement are urgently needed.

Analysis

Indonesia needs a legal and regulatory framework for e-commerce that takes into account the rapidly changing technological environment. To ensure a secure yet flexible market environment, legal and administrative reform should build confidence in and facilitate e-commerce and legal uncertainties must be resolved. The Government of Indonesia, therefore, should avoid creating burdensome rules and highly prescriptive regulations. For example, recent Presidential decrees about the IT industry will, if implemented, complicate matters. Decree PP No. 52/2000—which supposedly implements

the Telecommunication Laws UU No. 36/1999—states that every organization or institution using the Internet or operating an Internet café or a LAN or similar IT systems must obtain a permit to do so.

Legal and regulatory reform should be undertaken in two phases. In the first phase the Government, with private sector participation, should develop a flexible legal and regulatory framework that recognizes, facilitates, and enforces electronic transactions. This will provide critical support to the budding e-commerce activity in Indonesia by building trust and confidence in the public and private sector. The second phase should involve developing a comprehensive set of laws and regulations in response to specific market needs. As the market develops, more extensive legislation and regulation can specifically address market failures and other issues that may emerge with respect to consumers, corporate market needs, law enforcement, and public concerns. Until e-commerce activities assume greater penetration in Indonesia, the Government should proceed cautiously, by not over-regulating e-commerce and by using and building upon the existing legal framework to remove constraints where feasible. The Government should simultaneously strengthen undeveloped institutional capacity to develop and implement any new laws.

The following paragraphs identify legal constraints and areas needing legislative intervention, and recommends specific reforms to create a legal infrastructure that facilitates e-commerce, both in Indonesia and the global marketplace.

To guide the growth of e-commerce, Indonesia's reform policy should adopt the fundamental principles summarized below. These principles provide a consistent philosophical underpinning that appears to have contributed to the success of the Internet and e-commerce in the United States, the United Kingdom, Australia, and many countries in Europe. These principles are as follows:

The private sector should lead after initial financing of development by the government. Accordingly, Indonesia should encourage industry self-regulation where appropriate and support the private sector to develop mechanisms that facilitate the Internet operation. Where government action is necessary, private sector participation should be a formal part of the policy making process.

Government should avoid undue restrictions on e-commerce. E-commerce should be market-driven.

The aim of governmental intervention should be to support and enforce a predictable, minimalist, consistent, and simple legal environment for commerce. Wherever feasible, the government should refrain from creating new and unnecessary regulations, bureaucratic procedures, taxes, and tariffs. Commercial regulation works best when it corrects market failures but often fails when it tries to anticipate future developments of business practices.

Government should recognize the unique qualities of the Internet and adopt a technology-neutral approach to policy. Widespread competition and increased consumer choice should be the defining features of the new digital marketplace.

E-commerce over the Internet should be facilitated on a global basis.

National and International Strategy Coordination

The success of e-commerce relies in part on effective partnership between the private and public sector, with the private sector in the lead. In the United States the government is a facilitator

encouraging self-regulation in the private sector, but, at least in the initial stages, GOI will have to provide strategic direction and the infrastructure and info-structure necessary to ensure a secure and stable business and legal environment for e-commerce in Indonesia. The Government will have to be aggressive in policymaking, regulating electronic transactions, and establishing consumer confidence. Such intervention should gradually phase out as the market matures and the private sector develops its capacity for self-regulation. At the same time, over-regulation should be avoided and policy formulation should involve the private sector. GOI's goal should be to ensure competition, protect intellectual property rights and privacy, prevent fraud, foster transparency, support commercial transactions, and facilitate dispute resolution in an open market environment. Government participation must have a targeted approach to avoid inefficiencies and duplication in developing and reviewing policy. Changes in technology and the marketplace should determine an optimal environment in which e-commerce and community can flourish.

In undertaking legal and regulatory reform, Indonesia should take advantage of the best practices and experiences of other countries with respect to the complicated issues surrounding e-commerce law and policy. Indonesia's neighbors—Malaysia, Singapore, Thailand and the Philippines—have already begun to position e-commerce as a national strategy. Their governments function as effective facilitators in coordinating e-commerce development to provide clear guidelines to their public and private sectors. GOI should not, however, replicate these countries' e-commerce laws. Instead, it should focus on how e-commerce fits in Indonesia's social, political and economic framework. This can be accomplished through feasibility studies based on e-commerce legislation enacted in the United States, the United Kingdom, Canada, Germany, Singapore, Malaysia, Philippines, and India. In addition, the GOI should review the model law on e-commerce prepared by the United Nations Commission on International Trade Law (UNCITRAL). Many regional institutions, such as the Asia Pacific Economic Cooperation (APEC) and the Association of Southeast Asian Nations (ASEAN), are also working to develop and harmonize e-commerce in the region. As a member, Indonesia should benefit from such partnerships. For instance, ASEAN established an e-ASEAN Task Force in 1999 to help its members implement and draft e-commerce laws, liberalize trade by reducing tariffs on IT products and services, and call upon ASEAN heads of states to adopt e-governance. In 2001, ASEAN leaders are also expected to sign an e-Agreement that calls for a commitment in the promulgation of e-commerce friendly laws, with the UNCITRAL as a common framework. Similarly, APEC has included e-commerce in its working agenda. With U.S. leadership, APEC has established the E-Commerce Readiness Evaluation Action Partnerships (REAPs) initiative, which includes practical actions to remove roadblocks to e-commerce and undertakes pilot projects in the APEC region to close the digital divide.

Legal and Regulatory Reform

Indonesia needs to create a predictable legal and regulatory environment for e-commerce. Indonesian businesses and consumers are wary of conducting business over the Internet because there are no laws, regulations, or guidelines governing electronic transactions or providing clear direction on their validity, security, integrity, privacy and/or enforceability.

Legal and regulatory reform should aim to establish certainty of legal effect and build business and consumer confidence in the security of electronic transactions. Achieving these goals may or

may not require new legislation. Where reform is not needed, articulating that such reform or new legislation is not needed can provide enough certainty to encourage investment.

In formulating new rules that govern electronic transactions, legislators should adhere to the following established principles:

In most situations, parties should be free to order their contractual relationship without government intervention.

Rules should be technology-neutral, flexible, and forward-looking. This will allow new technologies to develop in the market. Over-specifying rules on matters such as electronic signatures can make it more difficult for a legal regime to incorporate more efficient technologies. A further argument in favor of technological neutrality is that legislators today cannot predict technological or legal developments.

Existing rules should be modified and new rules adopted only to the extent necessary or substantially desirable to support the use of electronic technologies.

New Legislative Drafting

GOI must draft new laws in several areas to spur e-commerce activity. Any proposed legislation should be uniform and conform to existing international standards so businesses will be able to trade confidently with overseas partners. It would be prudent to take cognizance of the work undertaken in other countries and by international organizations—the United States, the United Kingdom, Malaysia, Singapore, Canada, Germany, the Model Computer Commerce Law, and the Model Law on Electronic Commerce created under the auspices of the United Nations Commission on International Trade Law (UNCITRAL). In addition, it is important to ensure that there is interagency/ministerial coordination in these endeavors to avoid duplicative efforts. One effective way to facilitate inter-ministry coordination is to have a computerized network so that the ministries can communicate effectively.

Areas for New Legislative Drafting

- Validity of electronic documents
- Electronic signatures and contracts
- Certification authority
- Encryption and security

Validity of Electronic Documents

Indonesia does not have any law that either explicitly recognizes or denies the general principle that information and signatures in electronic form should be given legal effect. Indonesian law includes, however, a number of provisions that require documents to be in writing, for documents to be signed, or documents to be original, or a combination of these. An electronic document or signature does not appear to satisfy these requirements, and would likely be viewed as an unacceptable commercial risk by businesses and consumers. There is also legal uncertainty about the admissibility and evidentiary probity of electronic documents and data messages. GOI should remove this legal uncertainty by drafting new legislation or an executive regulation (ministerial decree) that recognizes that information and signatures in an electronic form should not be denied legal effect solely on the grounds that it they are in electronic form. It should ensure functional equivalence between electronic

and other forms of communication, where feasible. Admissibility and evidentiary probity of electronic information and data messages can be addressed through amendments to Indonesia's evidence code, if necessary. In the alternative, Indonesia's Supreme Court should issue guidelines to the lower courts (i.e., the district and appellate courts) clarifying the legal status of electronic evidence. There have been some efforts to amend the law to recognize electronic evidence. A 1997 regulation allows companies to store documents in electronic form. Indonesia's customs department is changing its paper-based payment system to an EDI system and Indonesia's two stock exchanges are implementing online trading systems.

Electronic Signatures and Contracts

Many countries are facing issues arising in the context of electronic contracts and signatures, and are drafting laws and guidelines addressing legal effect and validity of electronic contracts and signatures. In July 2000, President Clinton signed America's first federal e-signature law that provides legal validity to online contracts, signatures, notices and other records, and allows contracting parties to choose the technology for authenticating their transactions without government intervention.[9] Under the law, consumers maintain the right to choose or to do business and receive records on paper or online. Argentina, Australia, Germany, India, South Korea, Malaysia and Singapore have also enacted legislation on electronic signatures. Legislation in this area should deal simply with the legal effect of electronic signatures in a technology-neutral manner. Any legislation on electronic signatures must approached with caution because an inappropriate legislative regime may be adopted without regard to market-oriented solutions. Uncertainty as to the validity of the use of data messages for contract formation should be clarified.

Indonesia's laws on matters such as contract formation and evidentiary rules date back to the Dutch colonial era. Nothing in Indonesia's laws prevents businesses or consumers from entering into contracts or conducting commerce electronically, but businesses and consumers are wary of electronic transactions because of the absence of laws that address e-commerce explicitly. Indonesia should, therefore, attempt to draft legislation as soon as possible to ensure that online transactions have legal protections similar to those conducted offline. It is our understanding that MOIT has initiated the drafting of aspects of cyber law that address electronic signatures.

Certification Authority

One means to providing a fundamental measure of confidence in companies doing business online and distinguish legal compliance among those companies, would be to establish certification requirements for companies, services, and business practices that meet a clear set of standards of performance, reliability, quality and integrity. Consumers will be much more confident about conducting e-commerce with companies bearing certification if it carries a reputation for rigid oversight and enforcement of high standards in the industry or market. Lack of trust can be addressed by establishing a certification authority (CA) that is a trusted third party. In the United States., certification authorities are generally private companies. There is no federal legislation to regulate

[9] Electronic Signatures in Global and National Commerce Act, 2000.

certification authorities, and only a few states have addressed this issue. Utah has established the Division of Corporations and Commercial Code, which has the authority to make rules governing certification authorities. For now, however, electronic signatures are only as reliable as the certification authority, and it is the consumer's obligation to assess whether certificates are issued by reliable certification authorities.

Clearly, the safety and security of electronic transactions is at the forefront of all discussion on e-commerce in Indonesia. GOI may wish, therefore, to put in place a system for a certification authority as soon as possible. GOI should determine the most suitable and effective institutional mechanism for defining and issuing such certificates, and whether the CA should be a governmental entity, an NGO, or a private firm. Reportedly, GOI is considering appointing BSN (the National Standardization Agency of Indonesia) to establish a framework for a national certification authority that will issue e-commerce digital certificates in Indonesia.

Encryption and Security

To fully realize the potential of e-commerce, parties need to be assured that they are transacting business in an environment free from illegal attack and trespass. The most reliable means to secure business conducted electronically is through cryptography, that is, encryption and decryption techniques. Strong encryption is necessary for consumer protection and consumer confidence in e-commerce.

For various reasons, many countries regulate encryption technology. Some, including the United States, have adopted regulations restricting the use, import, and export of encryption technology. Having recently recognized the importance of encryption to the growth and spread of e-commerce, however, many governments are liberalizing those restrictions.

Indonesia has no law regulating encryption. Indonesia should take measures to ensure that e-commerce is as robust as traditional transactions. Since it is typically the private sector that leads in the area of encryption technology, GOI should ideally work in partnership with the private sector to develop a comprehensive policy on the standards of encryption permitted while importing and exporting data and also encryption standards for transactions within the country.

Reform in the Existing Legal Framework

Intellectual Property Rights

E-commerce has opened up entirely different dimensions of legal issues affecting intellectual property rights (IPRs). Adequate protection of IPRs is essential for the growth of e-commerce and the local ICT sector. Major issues are adequate protection and enforcement of (1) software and technology patents, (2) copyrights and related rights, (3) trade secrets, and (4) trademarks and domain names. Since electronic commerce involves the selling and licensing of information, intangible products and technology protected by IPRs, the electronic medium is especially susceptible to theft or misuse. Issues of liability for infringement and fair use have arisen, including whether ISPs, web hosting companies, and web site operators should be held responsible when their customers supply infringing material through their services. These issues need balanced resolution

and may call for a law or regulation that provides clear guidelines, protection, and liability limitations. Many countries have proposed or enacted legislation addressing these issues. In 1998, the United States enacted the Digital Millennium Copyright Act (DCMA) to protect copyrighted material online and to (1) limit the liability of online service providers for copyright infringement when engaging in certain activities, (2) provide an exemption for making a copy of a computer program by activating a computer for purposes of maintenance and repair; and (3) permit an ISP to avoid financial liability by complying with "notice and takedown" provisions.[10] Proliferation of the Internet has also given rise to the problem of "cyber-squatters" who routinely use well-known trademarks as their Internet domain names. This has resulted in increasing infringement litigation involving domain name use and trademark laws.

Indonesia recently initiated many reforms in its IPR regime and is computerizing the administration of the Directorate General of Intellectual Property (DGIP) in MOJHR (*Depkumdang*). There is a need to institutionally strengthen the DGIP to effectively clear up of a substantial backlog of IP applications, to socialize IP laws, and to aid in the enforcement of IPRs. Three new laws for protection of integrated circuits layouts, trade secrets, and industrial designs were enacted in 2000 and are currently subject to socialization. Patent, trademark, and copyright laws have been amended but enforcement is inadequate and ineffective.

Reform in Existing Legal Framework

- Intellectual Property Rights
- Privacy
- Alternative Dispute Resolution
- Taxation and Customs
- Consumer Protection
- Credit Card Liability Reform
- Content Regulation
- Law Enforcement/Computer Crimes

The country remains on the U.S. Trade Representative's "Special 301 priority watch list" because of its failure to combat IPR violations. Reportedly, the current rate of software piracy in Indonesia is more than 95 percent. Although Indonesia's IP laws impose criminal penalties on infringers, there needs to be a more focused effort to enforce these laws. Indonesia has made recent attempts to afford improved copyright protection to software and address violations but it lacks an enforcement mechanism. GOI should launch an anti-piracy software initiative to allow only legitimately licensed software in government offices.

To encourage private sector investment and local innovation in the ICT sector, it is imperative that Indonesia enact adequate and meaningful legislation that will not only provide requisite incentives to the local private sector to undertake R&D but also encourage technology transfer from foreign companies by building confidence that their technology will not be pirated in Indonesia. In addition, IP awareness units should be established in research institutes and universities focusing on science and technology, to aid in the socialization of IP laws and in filing and obtaining IPRs on inventions by local scientists and researchers. The Law Institute for Technology Studies at the University of Indonesia (*LKHT*) and the Institute of Technology in Bandung (ITB) have established such IPR management units to help university researchers with IPR filings. Establishment of such units is critical to improving local use of Indonesia's IP system—local use is estimated to be as low as 4 percent when compared to foreign filings. A strong IPR framework will also promote production

[10] 17 U.S.C. § 510.

of local content. To combat cyber-squatting, Indonesia should strengthen trademark protection to provide effective remedies against domain name pirates, and consider how to best develop the governance of the domain name system to settle conflicts between domain names and trademarks.

To strengthen the country's legal regime, Indonesia's Supreme Court established a special Intellectual Property Protection Judicial Council in 1997 to educate the judiciary on IP issues and to help clear the backlog of piracy cases. There is a need to increase such measures.

Indonesia is a signatory to the WTO-Trade Related Intellectual Property Rights (TRIPs) Agreement. It should bring its IPR regime into compliance with the TRIPs Agreement, and consider signing and ratifying the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty.

Privacy

Globally, the potential of the electronic medium to intrude into the privacy of individuals has received considerable attention; collection and usage of personal information by online merchants is a high-profile policy issue among both the public and policymakers. Technology increasingly facilitates obtaining detailed, personal information without the knowledge or consent of the consumer. Most countries' privacy regimes, whether prescriptive or voluntary, involve the principles of notice and consent. Some of these regimes can have an extra-territorial impact. For instance, the European Union Directive on Data Protection is likely to have a significant impact on non-member countries because it prohibits the export of personal data to non-EU countries whose data protection is not deemed "adequate" under the Directive.

The United States does not have privacy legislation that addresses the collection, storage, transmission, or use of personal information on or from the Internet or in other business environments. While certain basic privacy interests arise from the U.S. Constitution, privacy protection has generally been provided through ad hoc legislation and common law principles. As new technologies develop, new laws have been enacted to target specific privacy issues. For example, one piece of federal legislation is the recently enacted Electronic Communications Privacy Act that codifies privacy protection for electronic communications. Another recently enacted privacy law is the Children's On-line Privacy Protection Act.[11] Taking the position that privacy in e-commerce should be led by industry, not regulated by the government, the U.S. government has identified the following characteristics as necessary for effective self-regulation of privacy:

- Awareness
- Choice
- Data security
- Data integrity
- Consumer access
- Accountability
- Consumer recourse

[11] 15 U.S.C. § 6501. This Act, which took effect in April 1999, requires any operator of a commercial web site or online service to obtain "verifiable parental consent" before collecting, using, or disclosing personal information about a child under 13.

- Verification
- Consequences

In the United States, the private sector continues to develop guidelines and policies for online privacy and is motivated to self-regulate because government-imposed laws would be more burdensome than self-regulation. Some organizations have taken an "official stamp" approach by offering "privacy marks" to sites that comply with their privacy standards and may audit sites for compliance. Examples are BBB Online and TRUSTe. Australia and Japan have also adopted industry self-regulation supplemented with basic online privacy rules. The Japanese Ministry of International Trade and Industry (MITI) has implemented a system of privacy marks that businesses may display if they adhere to general policy guidelines governing the handling of personal data.

Indonesia should monitor these developments carefully to ensure consistency with its own policies. Indonesia should undertake a feasibility study to determine which privacy protection model would best suit its business and legal environment. A study should be undertaken to determine if more direct and detailed legislation is needed to protect the privacy of communications, since most of the existing laws only generally address the privacy of individuals.

Alternate Dispute Resolution

As e-commerce transactions become more global, businesses and consumers are increasingly wary of costs they may incur if they need to engage in cross-border litigation of their rights. Alternate Dispute Resolution mechanisms (ADR) are becoming customary and popular because they let consumers and merchants resolve disputes quickly and inexpensively through a trusted third party.

Indonesia should promote arbitration, including other ADRs such as conciliation and mediation, as a preferred mode for resolution of e-commerce disputes. Support and guidance can be drawn from several international organizations involved in international dispute settlement for e-commerce (e.g., International Court of Arbitration of the International Chamber of Commerce and the World Intellectual Property Organization's (WIPO) Internet-based WIPO-Net, which has been set up to arbitrate IPR-related e-commerce issues).

Taxation and Customs

The issues of taxation and customs duties on electronic transactions when they cross international boundaries is one of the most difficult that governments must confront.

Taxation

E-commerce has changed how businesses operate and challenged the adequacy and validity of principles of international taxation—physical presence, place of establishment etc. E-commerce also presents significant income tax and VAT or sales tax issues. There is a need to review and clarify the tax treatment of Internet-related transactions, without introducing new taxes or uncertainties. Rules for classifying the tax nature of electronic transactions may need to be developed. For income tax purposes, one issue is whether the activities undertaken in or with respect to a taxing jurisdiction provide sufficient basis for the jurisdiction to impose a tax. The classification of transactions is also critical for VAT and sales taxes.

Many countries, including the United States, the United Kingdom, and a few other European countries, have done considerable work on this subject. Most have advocated principles of neutrality, certainty, avoidance of double taxation, and low compliance costs. In 1998, the U.S. Congress passed the Internet Tax Freedom Act, which placed a three-year moratorium on certain state and local taxes levied on Internet activities.[12] The moratorium was recently extended for another five years until October 2006. Indonesia should keep these principles in mind when formulating policies on taxation of e-commerce.

Under the existing tax environment, Indonesian tax authorities routinely face tax evasion and avoidance. Because of the nature, volume, and speed of e-commerce transactions, tax authorities will face an even greater challenge. To tackle some of these problems, Indonesian tax authorities will have to develop a new form of record keeping to track all transactions and taxpayer identity so the revenue base is not eroded. International coordination and cooperation among tax authorities will be required to enforce Internet-related taxation and to resolve tax liability and compliance issues.

Customs

In many countries, the delivery of goods purchased via e-commerce is primarily implemented by postal and courier services. The Indonesian postal system needs to become more efficient and international courier services in Indonesia charge high rates for delivery. In addition, administrative regulations on customs value and duties are confusing and inconsistently applied. This poses a barrier to e-commerce. GOI should identify customs and accounting procedures that pose obstacles, simplify and clarify customs rules and regulations, improve delivery for both domestic and international products and services, and streamline procedures to ensure efficient movement of goods through customs and at predictable tariff schedules.

The United States supports a "duty-free cyberspace," that is, items sold on the Internet (electronic transmissions which are either services such as banking services or goods imported electronically such as software) are free of tariffs or customs duties. Currently, no WTO member considers electronic transmissions as imports subject to customs duties. In May 1998, WTO members, including Indonesia, agreed to continue refraining from imposing duties on e-commerce transmissions until 2001. This moratorium should be extended until global rules are clarified.

Consumer Protection

A major government role is in consumer education and protection. In the United States, consumer protection related to e-commerce is governed by the Federal Trade Commission (FTC) Act that prohibits unfair methods of competition, unfair or deceptive acts affecting commerce, and false advertising. Another important recent legislation is the Uniform Computer Information Transactions Act (UCITA), which provides safeguards for consumers online. The FTC is an independent regulator that promulgates and enforces rules to protect consumers, and works with private organizations to alert consumers to deceptive trade practices. The Organization for Economic Development (OECD)[13]

[12] Pub. L. No. 105-277, § 1100, 112 Stat. 2681 (1998).

[13] The OECD Guidelines for Consumer Protection in the Context of e-commerce can be accessed at the web site www.oecd.org

has published comprehensive guidelines for e-commerce consumer protection that are being adopted in various forms by many countries in Europe and outside Europe. It would be beneficial for Indonesia to undertake a thorough review of these guidelines.

Indonesia's recently enacted consumer protection legislation (Law No. 8/1999) became effective April 20, 2000. The law establishes an independent body—the National Consumer Protection Agency—to regulate consumer protection and a dispute settlement body—the Consumer Dispute Settlement Agency—in each regency to function as a small claims court for resolving conflicts between vendors and consumers. Reportedly, supplementing regulation to implement the law is still being prepared. It is not clear if the law will extend the same level of protection to Internet consumers and monitor Internet advertising activities. For e-commerce to develop, it will be critical that laws assign liability for improper or fraudulent business practices in the electronic medium. GOI should develop clear guidelines to protect consumer interests in the electronic environment and establish safeguards such as disclosure requirements, warranty guidelines, return of merchandise and refund system. But this does not have to be a strictly governmental activity. Partnership with private firms should be sought. For instance, there are two private firms in the United States that ensure consumer privacy, Online Privacy Alliance and BBB Online. They offer a "seal of approval" and third-party enforcement of self-established privacy rules.

Credit Card Liability Reform

Credit cards can be important to e-commerce, especially business-to-consumer transactions. In Indonesia, however, credit cards have not been successful, partly because cardholders are fully liable for a unauthorized third-party use, whether cards were lost or stolen. In the United States, credit card laws allocate responsibility for unauthorized charges in a way that protects consumers. By federal regulation, the liability limit is $50.[14] To encourage the use of credit cards, Indonesia should consider enacting legislation or regulation limiting cardholder liability.

Content

Content regulation has been an important issue for lawmakers around the world. Governments have responded to objectionable online content in a variety of ways, often balancing individual rights against social values. Some governments, such as in Singapore and China, have imposed broad restrictions to maintain cultural and religious values, social order or security, while others, such as Australia and the United States, have imposed targeted restrictions that ban only narrow categories of content.

Indonesia has a broadcasting law that classifies the Internet as a form of broadcasting media, which appears to make it subject to censorship. How such censorship would be applied is not clear. This uncertainty hampers e-commerce and content development. Indonesia should issue ministerial decrees clarifying the application and implementation of the broadcasting law. As in other countries facing the same issues, Indonesia should encourage private sector development and the use of

[14] 15 U.S.C. § 1643.

technology tools and services such as adult verification services, rating systems, and content filtering software so users may screen information entering their homes, workplaces, schools, and libraries.

Law Enforcement

Sophisticated technologies make e-commerce more susceptible to online fraud. The powers of law enforcement agencies are routinely undermined by new technological developments and the widespread ability to encrypt electronic information. Effective law enforcement will be critical to ensuring that the e-commerce environment is safe and secure.

Several countries, such as the United Kingdom, Singapore and Malaysia, have enacted legislation to deal specifically with computer and Internet-related crimes, including unauthorized access to computers and computer systems, unauthorized access with malicious intent, and unauthorized modification of computer material. Indonesia does not have a statute that expressly criminalizes computer misuse or Internet fraud and it is not clear if such acts would fall within the ambit of Indonesia's penal code. In most cases, application of the penal code depends on where a criminal act occurred. The "virtual" nature of certain electronic media may make it difficult to determine where the criminal activity occurred. The Indonesian penal code may, therefore, need amendments that specifically address computer and Internet-related crimes, such as piracy, espionage, and identity theft.

Law enforcement agencies will have to upgrade skills so their personnel understand, can identify and take into custody, if appropriate, and ultimately prosecute the violators of consumer trust and welfare. Several countries have created units in their law enforcement agencies to deal specifically with computer-related illegal activities, include activities on the Internet. Such units have been successful in monitoring, investigating, and prosecuting Internet-related crimes. This serves as a significant deterrent to Internet abuse and activities such as "computer hacking".

In Indonesia, it may be useful to create special law enforcement units with the technical training to monitor, investigate, and prosecute deceptive and fraudulent e-business practices and Internet-related criminal activities. These units could also establish a cooperation and information-sharing mechanism with foreign counterparts to deal with cross-border Internet-related crimes. For instance, in the United States, the Federal Trade Commission (FTC) is leading law enforcement and policy development to protect consumers from deceptive and fraudulent e-business practices. The FTC has developed a Web site (www.imsnricc.org) to facilitate international cooperation in law enforcement.

Administrative Reform

To realize the full and intended effect of the reforms discussed here, other bottlenecks that hinder effective implementation and enforcement of the legal infrastructure should be eliminated. All bottlenecks, such as the insufficient coordination among government agencies and overly broad bureaucratic discretion and undue delays, should be removed.

World Bank's Indonesia-Information Infrastructure and Application Development Project

While not specifically "policy," the following provides additional background on shaping the strategic direction of ICTs in the Republic of Indonesia.

Beginning in 1998, the World Bank (WB) initiated a US$ 34.5 million loan to Indonesia to expanding the telecommunications infrastructure in Indonesia. The project description reads:

> The project includes: (a) technical assistance, training, and advisory services to improve the legal and regulatory framework and the public sector framework for IT; (b) technical assistance and equipment to strengthen capacity, capability and support systems within PT Pos and extend its postal network to cover remote areas, and to pilot the design of a tourist information service in the Wartels; (c) technical assistance, training, and equipment to expand the science and technology network (IPTEKnet); and (d) a cost sharing scheme for advisory services to improve good technology practices targeted at small and medium enterprises.

The four Program Objectives of this World Bank Loan (e.g., International Finance Corporation) are reflected as follows:

> Extend and intensify communications and information networks to facilitate sustainable regional development and economic growth. This is achieved through the following: (a) Extend postal communication network to the rural regions to establish a basic communications medium for the first time; (b) Extend Email, Internet and tourism information services selectively to promote wider usage for information access towards the promotion of knowledge acquisition and economic growth; and (c) Introduce new value added services using existing postal and electronic networks to be able to reasoned effectively to rapidly changing global market needs to gain competitive advantage.
>
> Develop appropriate legal and regulatory frameworks that would effectively create the enabling environment for the provision of above services in a sustainable manner, and that would foster further development of information infrastructure in Indonesia beyond this project.
>
> Strengthen institutional capability and capacity in the relevant agencies and administrations, namely MTPT, PT Pos, IPTEKNet, and BAPPENAS, to be able to efficiently manage the new information networks and to be able to undertake further development. With respect to catalyzing broader development of the networks rapidly, the project promotes private sector partnerships in the provision and management of information networks and systems.
>
> Establish a program to promote private sector development at the user end of the value chain of information services in order to stimulate sustainable market development that would effectively utilize the new or enhanced supply of information services. The program is focused on alleviating the primary bottleneck that exists in developing the private sector in the information services industry.

As part of this assessment, the team stayed in close contact with WB participants to establish a close coordination between this WB program and its activities and what USAID may decide to pursue as a result of this assessment. This dialog began with an initial set of meetings in Indonesia between Bernard Drum, Jonathan Metzger, and USAID/Jakarta Mission management in December 2000. Follow-up phone conversations between Darrell Owen, the ICT Assessment Team Leader, Robert Schware, and Peter Smith, served to provide additional information exchange. Subsequently,

prior to the Team's visit to Indonesia a meeting between Darrell, Jonathan, Carlo Rossotto, and Peter Smith took place to further this coordination. Further, Steve and Jonathan met with Bernard Drum while he was in Washington DC, during the first week of the Assessment (16 January 2001)—along with a representative with the Japanese Embassy. In addition, Peter Smith returned to Indonesia on 29 January 2001 and coordinated the first week of his activities with Steve Mintz, a Team member who was still be in country that week.

As it turns out, Robert Schware had just completed a project review of the WB loan providing a current status of progress on their activities under the Information Infrastructure Development Project (IIDP). In addition, several initiatives dealing with key ICT elements such as e-commerce and infrastructure were initiated under this initiative and within the next month, will deliver final reports. The following reflects several key elements of, associated with, or engaged via, the World Bank's IIDP activities:

IT Framework—an effort to improve the GOI's management of ICT investments and procurements, but subsequently expanded to address key ICT directly/policy related issues;

***Telematics Coordinating Team* (*TKTI*)**—establishment of a high level coordinating team for Telecommunications, Media, and Information Technology, made up of both public and private sector institutions (established by Presidential Decree 50/2000) to accelerate the use and development of ICTs in the country;

IPTEKnet—a *BPPT* project which will seek to privatize IPTEKnet into a self-sustaining ISP, yet have it serve as the sole source for providing GOI online support services (a *Perjan* or government chartered enterprise);

DGIP—development of an Institutional Development Plan for DG Intellectual Property and a reorganization under the Ministry of Justice and Human Rights, as well as three new pieces of legislation for Integrated Circuits, Trade Secrets, and Industrial Design;

NCA—recognized need for a National Certification Authority to be established under Ministry of Trade, Arts and Culture (MTAC); approved but not acted upon during this Assessment; and

E-Commerce—an activity whereby the Paul Kimberley & Associates have been engaged to assess and develop recommendations regarding setting E-Commerce law in Indonesia (report to be completed in late February 2001).

One issue that should be discussed in a multi-donor forum is the future role of IPTEKnet. During the course of the ICT assessment, the team heard many complaints by the private Internet service provider industry and other ICT companies that IPTEKnet is involved in services that should be provided privately and that is crowding out private enterprise.

Indonesia's Nascent Private Initiative—Telematics Movement

Yet another major private sector-driven initiative in this area, 57 projects are listed under the National Telematics Movement (*Gerakan National Telematika - Genetika*). Most of these projects are privately funded and many are awaiting further investments. The movement holds potential for becoming a significant initiative pulling together a broad-array of ICT-related issues, and in shaping

the strategic direction over the next several years. The movement is coordinated by the Telematics Compartment of the Indonesian Chambers of Commerce and Industry (*KADIN*)[15] consist of a number of industry associations as well as an umbrella industry group, the ICT/Telematics Society (*Mastel* which consists of 17 participating industry associations as well as several prominent universities and other educational institution). The movement is an attempt to find together complementarities between projects and work together to raise the profile of ICT issues amongst policy makers and the public (see Appendix G).

Indonesian Government Initiative—Telematics Coordinating Team

Indonesia Telematics Coordination Team *(TKTI)* is a high-level inter-Ministerial coordinating team on Information Communication Technology and Mass Media issues, headed by the Vice President and consisting of representatives from both the public and the private sector (for members, see Appendix H). It was initially established by the Presidential Decree No. 186/1998 and recently reorganized under the directives of Presidential Decree No. 50/April 7, 2000. In anticipation of the increasing demand for information technology and telecommunications goods and services, GOI formed the Team to coordinate and identify synergies in the development of relevant infrastructure, applications and resources to engage in:

- ICT policy formulation;
- Planning and priority setting of the development and utilization of ICT;
- Monitoring ICT activities; and
- Report on ICT developments to the President.

There are five working groups that have both public and private participation that are working on infrastructure, investment, standardization, applications and legal issues. There are several national programs have been adopted by *TKTI* including:

A national official information portal (www.info-ri.com) which developed by the National Information and Communication Agency (*BIKN*, formerly Ministry of Information under the previous Suharto government);

A national exhibition program in at least 15 cities, the Millennium Internet Roadshow 2001 that is largely private sector funded. However, the links with other competing government portal initiatives such as RI-Net at the State Secretary and IpTekNet at the Agency for Assessment and Application of Technology – *BPPT*) is yet to be defined. Some other *TKTI* initiatives are also being supported by the WB activities (outlined above),

The “School 2000” program in collaboration with an industry association (*APJII*),

National identity (*KTP*) registration program which will be the foundation of e-government

[15] While the Telematics Compartment is formally part of the national KADIN organization, its young industry associations and the companies that they represent are also young organizations that do not rely on government contracts, a feature of most organizations and companies associated with the national KADIN.

In December 2000, there was a strong industry opposition when the Coordinating Minister of Economic Matters attempted to replace *TKTI* with a new Informatics and Telecommunication Industrial Development Commission (*KPIITI*). President Wahid did not give his approval to *KPIITI* and continued to give his support to the *TKTI*.

The Telematics Team, which is coordinated day-to-day by its Secretary, the Deputy of the Ministry of Administrative Reform, provides a forum for interaction between high-level Ministerial officials as well. In addition, leading figures from the Telematics Movement are members of *TKTI* working groups and as such it warrants some consideration here under “Policy”. Such interactions between private and public leading figures are essential if over-regulation is to be avoided and to ensure private sector participation in policy formulation.

3. Pipes

Telecommunications infrastructure is now recognized as critical to development as globalization increasingly relies on ICTs as a fundamental component (e.g., e-commerce, e-business). This chapter examines Indonesia's in-country telecommunications environment from several perspectives and levels and includes an overview of

- Public telephone access,
- Mobile wireless,
- Internet services,
- International connectivity, and
- Personal computers.

It also includes observations from International Telecommunications Union (ITU) statistical data.

SUMMARY

The telecommunications situation in Indonesia is characterized by (1) a single monopoly provider (PT Telkom) of domestic telecommunication services (including domestic long distance) and two international long distance operators with exclusive licenses (PT Indosat and PT Satelindo); (2) a rapidly expanding mobile telephony market dominated by three firms; and (3) a relatively open data/Internet environment with a significant number of ISPs operating in the market, but with only a handful having the majority of the market share and market constricted because of PT Telkom charging pulse-rate-based local use fees on its local loop.

Overall teledensity in Indonesia is relatively low (<3:100) with a wide disparity between urban and rural areas. Internet access is quite low (estimated at around 150,000 ISP subscriptions with 1,500,000 users for a population of 209,250,000). This is due in part to the high cost of PCs and charges for Internet use relative to the gross domestic product per capita (in 2000 US$ 617 nominal and US$ 2,940 based on ratios of purchasing power parity according to WB sources compared to at US$ 605 nominal for 1998 as estimated by ITU).

Findings—Pipes

- Monopoly domestic provider and duopoly international provider
- National Teledensity is 2.91:100
- High rate of public access to telephony (including 185K Wartels) moving to Warnets
- Domestic pricing is low—potentially unsustainably low
- Expansion of land-lines is near zero; for mobile around 100% per year
- Approximately 140 (and 35 operational) licensed ISPs with approximately 150K Internet subscribers and 1.5 M users
- Approximately 2 million PCs in Indonesia
- Cable Internet growing rapidly

Pricing in Indonesia is complex. Retail prices for domestic access to basic services are quite low compared to other countries in the Asia-Pacific region, and potentially below actual costs in some areas. This is largely due to government controls that have restricted increases based on the currency

devaluation of recent years. Also affecting pricing is the interconnection tariff rates between PT Telkom and the five KSOs. Two factors here are the basis for establishing interconnection costs and the distribution of the collected tariffs. This remains a major issue and, combined with the rates, is slowing investment in landline expansion. As for the Internet, domestic rates from the consumer to the ISP are reasonable (with cable increasingly becoming a non-pulse-based alternative), but access fees for the ISPs are very high because of limits attributable to the PT Indosat and PT Satelindo duopoly for international connections. This raises the rates and is especially critical for high-demand users such as the ISPs and software companies, who pay rates several times those in the United States.

Perhaps one of the most significant issues in the *Pipes* arena is expanding access to rural areas where a large portion of Indonesia's people lives. Investment uncertainties caused by the new Telecommunications Law and PT Telkom/KSO issues are restrictive in more populated areas and even more so in rural areas. Additional build out and affordable rates are critical not only for expanding Indonesia's future links with itself and the expanding global economy, but for support of the Republic of Indonesia's decentralization initiative.

INDONESIA'S TELECOMMUNICATIONS ENVIRONMENT

Indonesia's telecommunications environment has been set by the Telecommunications Law 3/1989, which has been refined through rules, regulations, and decrees. It can best be characterized as government owned and operated, with partial liberalization and multiple players in the cellular and ISP markets, but with main telephone services (domestic and international) dominated by one monopoly that provides domestic services and two firms with exclusive rights to provide international connectivity. Other participating private sector firms link directly with one of the state-owned duopoly providers.

PT Telkom retains a monopoly on all domestic telecommunication services (local and long distance). Its monopoly for local services runs until 2010 and for domestic long distance until 2005. The Government of Indonesia owns 65 percent of PT Telkom.

PT Indonesia Satellite Corporation's (PT Indosat) and PT Satelit Palapa (PT Satelindo), both hold exclusive rights for providing international connections. It is estimated that PT Indosat controls 85 percent of the international long distance market in Indonesia. While the name implies these international services are via satellite, most of the traffic is currently provided via submarine cables—copper and fiber. The exclusive rights for both firms continue into 2004. At present the Government of Indonesia owns 75 percent of PT Indosat. Interestingly, PT Satelindo's ownership includes PT Telkom (22.5 percent) and PT Indosat (7.5 percent). Other owners include Bimagraha Telekomindo (45 percent) and Deutsche Telecom (25 percent).

As for domestic services, PT Telkom has a monopoly in Indonesia for domestic services—local and long distance—but it provides these services through its own facilities and five regionally based firms with which it has joint operating agreements (KSOs). These include the following:

Sumatra Region*:* PT Pramindo Ikat Nusantara consortium (linked with France Cables et Radio, Marubeni, and Nichimen and PT Astra Nusantara as lead domestic investor).

***West Java Region**:* PT Ariawest International (linked with MediaOne, now AT&T and PT Artimas Kencana).

***Central Java & Yogyakarta Regions**:* Mitra Global TI (linked with Telstra Global, NTT, Itochu, and Sumitomo and PT Indosat).

***Kalimantan Region**:* Cable and Wireless Mitratel (linked with Cable and Wireless and TM Communications but replaced by Telekom Malaysia and PT Intidaya Sistelindo).

***East Indonesia**:* Bukaka Singtel (linked with Singapore Telecom and PT Bukaka Telekomindo).

According to the above-referenced report, PT Telkom and the five KSOs combined had approximately 7,429,262 lines as of the end of calendar year 1999. Using this as a base, the total lines in service are placed at 3,256,992 by PT Telkom and 2,823,201 by the KSOs (these are less than the total capacity, reflecting only the "in service" lines). The ITU places the number at 6,080,200 for a teledensity (phone lines per 100 inhabitants) of 2.91 and reflects that approximately 73 percent of the total switching capacity available in Indonesia is currently used.

Public Telephone Access

Indonesia's reliance on publicly accessible telephones is amongst the highest in the Asia-Pacific region. While there is a relatively low per household penetration within Indonesia, it has one of the highest percentages of its main lines (4.43 percent) dedicated to public access (against an average for Lower-income countries in the Asia-Pacific region of 2.61).

One of the most successful approaches in Indonesia has been via a franchise model called "*Warung Telekomunikasi*" (Wartels). At present there are over 185,000 Wartels in Indonesia, accounting for over half of the public telephone facilities. These franchised Wartels receive discounted tariffs from PT Telkom and as a result of the low teledensity at the household level, they collectively generate approximately a quarter of all telephone traffic in Indonesia, and contribute approximately 20 percent of PT Telkom's revenue from telephones. More recently a growing number of these *Wartels* are adding Internet services and being converted to *Warung Internet Kafes* or "*Warnets*." This is primarily taking place in the larger cities (where the *Wartels* are already located), and have the distinct advantage of providing relatively low cost Internet access as the user doesn't need to buy a personal computer, subscribe to an online service, and pay the per minute access fees. Here again the ITU data reflects

Mobile Telephony

The mobile cellular market in Indonesia has been very dynamic over the past several years and according to ITU, has grown at an compound annual growth rate (CAGR) between 1995 and 1999 of just over 80 percent (during which much of this period Indonesia was experience a currency crisis). According to the ISA referenced above (issued July 2000 by the US Embassy in Jakarta), the growth rate for 1999 alone was put at 108.4 percent, with the number of mobile cellular subscribers in Indonesia at the end of calendar year 1999 being 2,220,969. This reflects that over 25 percent of the total telephone subscribers in Indonesia are wireless mobile.

There are currently seven mobile cellular operators with operations in Indonesia. These include Excelcomindo (offering GSM[16]), Komselindo (offering AMPS[17]), Metrosel (offering AMPS), Mobisel (offering NMT-450), Satelindo (offering (GSM), Telkomsel (offering GSM), and Telesera (offering AMPS). Of these seven operators, the three firms offering GSM account for over 95 percent of the market (Satelindo with 32.22 percent; Telkomsel with 46.16 percent, and Excelkomindo with 17.24 percent).

Internet Services

The Internet was introduced into Indonesia in 1994 through the academic institutions. While the current number of Internet subscriptions vary depending on when the data was collected or estimates made, in general the numbers of subscribers is placed at between 125,000 and 200,000, with the number of actual users as being on the order of 1,000,000.

Internet Service Providers

The current number of issued Internet Service Providers (ISPs) licenses is placed at over 140 (at INET 2000 the number was placed at 47). However, it is commonly understood that there are closer to 35 currently in operations. And of this group, only a very few have substantial subscription bases to ensure their sustainability. The Indonesian Telecom Industry at a Crossroads report published by the US Embassy in Jakarta[18] report indicates that approximately 75 percent of the subscriber/user base are in Jakarta, 15 percent in Surabaya, and 5 percent in other Javanese cities—with the remaining 5 percent in other provinces. Only a few ISPs provide services outside of the largest cities, with WASANTARAnet (owned by PT pos Indonesia) offering Internet in 26 provinces and INDOSATnet (owned by PT Indosat) serving 12 big cities in Indonesia with plans to expand to 33 cities by 2003. INDOSATnet alone is thought to have approximately 30 percent of the ISP market in Indonesia.

While there are a number of ISPs in the current marketplace, it appears a few have the bulk of the customer/subscriber base. US Embassy report cited above reflects that of the current Internet service providers, only five had in excess of 10,000 subscribers, with half of the ISPs having a subscriber base of less than 1,000.[19] An Industry Sector Analysis (ISA) used in July 2000 by the Embassy in Jakarta (written by Agam Tasnim) reflects that PT Cyberindo Aditama (CBN) had a subscriber base of 30,000, and that INDOSATnet had a subscriber base at that time of 45,000. Both are projecting rapid growth over the next year, but assuming this correlates to the ITU data of 125,000 subscribers, these two firms alone combine for subscriber base between them of 75,000 or 60 percent of the Indonesian market.

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[16] Global System for Mobile Telephony (digital)

[17] American Mobile Phone System (analog)

[18] The Indonesian Telecom Industry at a Crossroads (http://www.usembassyjakarta.org/econ/Indo-Telecom.htm)

[19] The Indonesian Telecom Industry at a Crossroads

Some consolidation is occurring also amongst ISP operators. M-Web, a multinational group based in South Africa is reported to spend $10 million in its acquisition of several domestic ISPs and is planning to build 2000 *Warnets* in several large cities in 2001. The company is also locating its ISPs within university campuses, particularly state universities. According to the company, student user rates are around 50 per cent of total students while only 5 per cent of total students at private universities tend to use the Internet for those enrolled in the early years; but closer to graduation the user rate could go as high as 60 per cent in both cases.

Yet another key ISP in Indonesia is IPTEKnet. IPTEKnet (the Science and Technology Information Network) is provided by the government Agency for the Assessment and Application of Technology (*Badan Pengkajian dan Penerapan Teknologi* or *BPPT*). At present IPTEKnet is the exclusive ISP for six government ministries with plans to become the sole ISP for all government ministries.

While there is a competitive ISP marketplace within Indonesia, there are two key areas where the current monopoly and exclusivity licensing takes its toll with regard to holding down the growth of the Internet. First, PT Telkom, the current monopoly provider for main lines, maintains the commanding position that severely limits Internet use within Indonesia in that it does the distribution and inflates the price of access (one of the highest in the Asia-Pacific region). While PT Telkom does have price differentiation based on time of day, the current pricing scheme is such that local calls rely on a pulse-based approach where actual use is on a per-minute basis. This virtually eliminates household use by the average Indonesia due to high connect costs.

The current regulation of wireless local area network (LAN) of 2.4-2.48 GHz is proving to be a major impediment for ISPs, *Warnets*, schools and wireless LAN companies which are users of this facility. In December 2000, the Director General of Pos and Telecommunication (MOCT) ruled that hub users of this frequency must register on first come first serve basis and pay a license fee. There is also a great variation in the price of bandwidth. This ruling has particularly affected schools and Internet business in Yogyakarta, Surabaya and Bandung rather than Jakarta (*Bisnis Indonesia* 01/29/01). There is an urgent need for the MOC and the private sector to work together on the spread spectrum management as the present situation is already causing a slowing down of wireless Internet access.

Recent reports suggest that PT Telkom has made an application to GOI to be allocated its share of the 2.4 GHz frequency since June 2000 to operate 2 x 30 MHz which is the band for Instrumentation, Science & Medical (ISM). The purpose of this request is to spread its wireless network involving the development of automatic central exchanges connected to this wireless network as a backup system. If this goes ahead, industry observers are concerned that many *Warnets* which use this wireless frequency might be faced with greater infrastructure costs (Detik.com 01/30/01).

In addition, a nine-fold increase (from Rp 35,000 to Rp 300,000) in the monthly rental charge of land lines for ISPs by PT Telkom is seen by many observers in the ICT as an attempt to stifle competition of ISPs. PT Telkom operates its own telephone landline based ISP telekomnet2@instan and a high-speed service ISP, telenet@plus (*Gatra* 02/3/01).

And second, there are only two sources for obtaining international Internet connectivity, PT Indosat or PT Satelindo. Unfortunately they are both also providing ISP support which places them in direct competition with those they are supporting.

Cyber Cafes/Community Information Centers

One of the obvious solutions for accommodating the relatively high price of buying a PC and the high cost of Internet access (due to pulse-based pricing by PT Telecom), is the use of shared-access facilities such as TelCenters, Cyber Cafes and Community Information Centers (CICs). The emerging *Warnets* will no doubt be successful in providing this valuable access service in the larger urban areas. Several models of such centers have been developed by *Mastel* (Community Information Center, *BIM*) and by an industry association APPKAI in as part of an APEC program (Business Information Center, see *Genetika* programs, Appendix H).

However, in rural settings this will also likely need to include access to telephony services since the teledensity of the rural areas is so low and costly to build out. Ideally these could be set up such that they are community-based and used to deliver a range of ICT-provided services to those living in the local community. For such an effort to have a broad-based impact on Indonesia, a concerted effort would need to be undertaken in lieu of, or as an extension of the *Warnet* approach which focuses predominantly on the urban areas. Ideas for such efforts are reflected in a recent study undertaken by the National Telephone Cooperative Association (NTCA).[20]

Remote Telephony and Internet Access

The issue of expanding the reach of telephony and Internet access into remote areas is critical. At present the *Wartels/Warnets*, as well as similar shared-access telecenters play a vital role in providing public access in urban areas. However, at present these are limited to locations where there are existing land-lines provided either by PT Telkom or the five KSOs. In more remote locations these lines are not installed therefore this option is not available.

Discussions with PT Telkom reveal future near-term plans to introduce two-way Satellite-based voice and Internet services into currently unserved areas. This technology solution builds off of their current Turbo Port solution which at present delivers one-way Internet access via satellite, with the outroute provided via dialup. This “Multi-Media Center” technology set will provide relatively a relatively low-cost solution via a 2 meter VSAT, and will support both voice (with a small PBX) as well as Internet. Plans are to pilot this solution in the second quarter of 2001, with commercial availability by the fourth quarter. Estimated initial costs for a stand-alone set up are placed at 50,000,000 Rupiahs (approximately US$ 5,000-6,000). Pricing for access rates has yet to be determined.

This solution could well provide a major breakthrough for reaching currently unserved areas with not only basic services, but also Internet access. The PT Telkom provided solutions could also be expanded via wireless technologies to link to multiple locations the surrounding areas, such that one access point could provide support to schools, local governments, local Warnet-line information centers, local businesses, etc. With respect to supporting the national decentralization initiative, and USAID’s developmental activities, this planned service holds much promise.

[20] Role of the Private Sector in Sustainability of Community Information Centers. National Telephone Cooperative Association. June 2000

International Connectivity

For international connectivity, Indonesia relies on satellites as well as undersea cable (copper and fiber). In recent months, PT Telkom moved to replace an aging Palapa BR2 satellite with a new Telkom 1 with greater power, reliability, and bandwidth for supporting Internet and more advanced teleconferencing and multimedia services. This expanded capacity could be very critical in expanding Internet access to remote rural areas/island within Indonesia.

In addition to the new satellite capabilities, PT Telkom inaugurated a new fiber optic cable linking Surabaya (Java), Banjarmasin (Kalimantan) and Ujung Pandang (Sulawesi). This backbone was financed by the World Bank and used to connect eastern and western Indonesia. This new capacity augments PT Telkom's current 34 Mpbs backbone network that currently provides capacity for both telephony and data/Internet (under a strategic partnership between PT Telkom and the ISPs).

ITU Telecommunications Information

Each year the International Telecommunications Union (ITU) publishes a World Telecommunications Development Report.[21] Its most recent report issued on October 10,1999, included data on mobile cellular. In addition, it reflects indicators of basic and international telecommunications, television, and Internet usage.

In December 2000, the ITU published an Asia-Pacific Telecommunication Indicators 2000 report [22] with updated 1999 data. Using mid-year estimates from the United Nations, the report placed Indonesia's 1999 population at 209,250,000; and using information from the International Monetary Fund and the Organization for Economic Co-operation and Development, it places Indonesia's Gross Domestic Product (GDP) for 1998 at US$ 124.8 billion, with a calculated per capita GDP of US$ 605 for 1998. Indonesia, therefore, is classified as a "lower-income" country—a country with a Gross National Product (GNP) per capita of less than US$ 786.[23]

Tables with data extracted from the December 2000 report are in Appendix G. For this analysis, Indonesia data was compared to averages for other lower-income, upper-income, and developed countries in the Asia-Pacific region (including an Asia-Pacific regional average). The following subsections summarize observations derived from these data. Actual data along with these observations are in Appendix G.

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[21] World Telecommunications Development Report—1999. Mobile and World Telecommunications Indicators.

ITU. Geneva, Switzerland. 10 October 1999.

[22] Asia-Pacific Telecommunication Indicators 2000. ITU. Geneva, Switzerland. 3 December 2000.

[23] But more recent data are significantly different. For example, the WB for 1998 placed Indonesia's nominal GNP per capita using the Atlas method at US$ 640 in 1998 and US$ 580 in 1999, a remarkable contrast to the figure in 1995 of US$ 1,000 prior to the financial crisis. See http://devdata.worldbank.org/external/dgprofile.asp

Basic Indicators

Indonesia has a slightly lower population density and calculated per capita GDP than other lower-income countries in the region.

Indonesia's teledensity (telephone lines per 100 inhabitants) is significantly below the average for the lower-income countries in the region, and drastically below the neighboring upper-income and developed countries. (That average is somewhat inflated because of China's large population. When China is factored out, Indonesia is closer to the regional average for lower-income countries, but still lower than average. India's numbers are close to the average for the lower-income countries in the region.)

Main Telephone Lines

Between 1995 and 1999, Indonesia's growth in main telephone lines was been rapid, but somewhat below the lower-income country average for the region

Viewed from a per population (teledensity) perspective, Indonesia's growth is even less as a percentage as it takes into account the growth in population.

Indonesia and the other lower-income countries are "catching up" to the upper-income and developing countries in this region. Compound annual growth for lower-income countries is more than 20 percent and only 3 percent for upper-income and developed countries (growth rates typically start to drop off when a country reaches a teledensity level of 30-40. Also the growth in deployment of mobile wireless telephony frequently serves as a substitute for main telephone lines and therefore must be factored in).

China and India again have a significant impact on the averages for the lower-income countries in the region as between the two of them, the number of their main telephone lines account for 71 percent and 79 percent of the number of lines in the region for 1995 and 1999, respectively.

While not reflected in these data, another indicator frequently used to reflect limitations on growth is a set of waiting list data. Unfortunately the new December 2000 ITU report on Asia-Pacific countries does not contain any waiting list data for Indonesia. But at the lower-income, upper-income, developed and Asia-Pacific regional level, there are few exceptions where this appears to be a significant issue (average waiting time is 0.3 years).

Local Telephone Network

Indonesia's telephone system is 100 percent digital.

Indonesia's "faults per line per year" is among the best in the entire Asia-Pacific.

Indonesia's build-out of infrastructure is such that there is ample capacity to support more growth in the number of lines.

The percent of residential subscribers for Indonesia is in keeping with the averages for the region.

Teleaccessibility – 1999

Indonesia's 9.2 main lines per 100 *households* is among the lowest of lower-income countries in the region. But Indonesia has the highest percentage of its main lines dedicated to *public access*.

Largest City Main Lines – 1999

Most Indonesians live in rural areas, with only 4.6 percent living in the largest city. This is above average for lower-income countries in the region, but this is due in large part to the data being skewed by the large populations of China and India, where the percentage of urban population is considerably less than Indonesia.

Indonesia's teledensity data reflects a significant gulf between main lines available in urban areas and in rural. This urban-rural difference is more pronounced in Indonesia than in other lower-income countries in the region.

Telephone Tariffs - 1999

Indonesia's connection and monthly subscription pricing for both residential and business is significantly below other lower-income countries in the region.

Indonesia's local call pricing is also considerably below the other lower-income countries in the region.

As a percent of GDP per capita, Indonesia's telephone tariffs appear to be significantly lower than other lower-income countries in the region, but higher than both the upper-income and developed countries.

There may be some reason to suspect that the pricing for connection, monthly subscription, and local calls could be below cost and that there is the some tariff cross-subsidization taking place; rebalancing may be needed (needs further analysis).

In that population and numbers of lines do not impact this data, there is no unique distortion by China and India in these averages

Cellular Subscribers

Indonesia's growth in cellular subscribers is appreciably greater than other lower-income countries in the region.

Indonesia's growth rate in cellular mobile is one of the fastest for lower-income countries in the, with only India, China, and Bangladesh growing at a faster rate;

Indonesia's cellular mobile systems are nearly 100 percent digital whereas some other countries in the region are not.

Over one-quarter of Indonesia's telephone subscribers are mobile subscribers.

International Telephone Traffic – 1999

Indonesia's growth in outgoing telephone traffic between 1995 and 1999 is consistent with other countries in the region.

Indonesia's international traffic on a *per inhabitant* basis is also in keeping with other lower-income countries.

Indonesia's international traffic on a *per subscriber* basis is considerably higher than other lower-income countries in region, but the average is distorted by the large populations of India and China and their low minutes per subscriber.

Telecommunications Staff – 1999

Data for Indonesia reflects that its operational efficiencies are improving as the number of main lines being supported per employee is up considerably between 1995 and 1999.

Staff increases between 1995 and 1999 are on the order of a Compound Annual Growth Rate of 3.1 percent compared to the number of lines having a CAGR for this period of 13.1 percent. This ratio is not in keeping with the upper-income and developing countries but where the number of lines per employee is on average on the order of 200-300.

Telecommunications Revenue

Indonesia's telecommunications revenue on a *per inhabitant* basis is among the lowest in the region.

Indonesia's telecommunications revenue on a *per line* basis is below the lower-income country average. When China is factored out, the average revenue per line for the lower-income countries is substantially lower, and Indonesia's revenue per line is actually above the average for lower-income countries in the region. This relatively high revenue per main line is the result of low teledensity and therefore more use (thus revenue) per main line.

Indonesia's telecommunications revenue as a percentage of GDP is also among the lowest in the region.

As with connection, subscription, and local call pricing, these numbers indicate that pricing may be below cost and that there is some tariff cross-subsidization taking place (e.g., long distance and international); tariff rebalancing may be needed (this needs further analysis).

Telecommunications Investment

Indonesia's telecommunications investment *per inhabitant* and *per main line* is among the lowest in the region.

Indonesia's telecommunications investment as a *percent of revenue* is amongst the lowest of the lower-income developing countries.

Internet in Asia-Pacific – 1999

As of June 2000, there were 125,000 Internet subscribers in Indonesia and 1,000,000 users.

On a percent of penetration basis, Indonesia's penetration of Internet is considerably below the average for the developing countries in the region.

As a percent of population, the numbers of personal computers within Indonesia is consistent with the average for developing countries in the region.

There are staggering differences in the penetration of the Internet and personal computers among the Asia-Pacific countries, when comparing the developing countries (including Indonesia) with the 4-Tiger countries and the developed countries.

There are 1,900,000 personal computers in Indonesia.

Dial-up Internet Access Prices in Asia-Pacific

ISP-related Internet access costs (signup, monthly, and excess time) are all quite low in Indonesia as compared to other lower-income countries in the region.

Telephone call charges for accessing the Internet in Indonesia are among the highest of the lower-income countries in the region, and well above the average for all countries.

Total costs (ISP and telephone charges) are below the average of the lower-income, upper-income, and developed countries in the region.

4. Private Sector

It is the private sector that must generate the business activity that establishes and maintains economic growth and improves the living standards of citizens. This chapter focuses on the following for leveraging ICTs in Indonesia:

Determining the strength and potential of the ICT-related sector to support domestic and international markets, and

Local business reliance on ICTs to improve operations and, where appropriate, become more competitive in the global marketplace.

SUMMARY

In recent years, Indonesia's private sector has had a very difficult time financially because of political and economic uncertainties. The currency crisis in 1997-1998 took a devastating toll on virtually all businesses, but recovery is underway. In this context, ICT businesses, especially Internet-related ones, can perhaps best be described as young, energetic, focused, committed, and very talented. Many recent startups also appear to have substantial funding sources. A number of Internet firms provide services to the local community, and already consolidations are taking place. The number of small software firms in Indonesia is growing, with some employing 50-100 people and delivering products and services for the domestic and international markets. While Bali Camp and now Toba Camp are touted in the popular press as successes, many other private initiatives don't get this coverage. This sector is supported by several ICT-related business associations.

Findings: Private Sector

- ICT sector (including Internet) dominated by dynamic youth, committed to growth, with connections and financing
- Big telecom players (KSOs) are struggling financially
- Some growing use of Internet for B2B by non-ICT sector
- Small, but growing B2C by non-ICT sector
- Some Internet consolidations
- Bali Camp model being applied elsewhere (Toba Camp in northern Sumatra)
- Software incubator houses are growing
- Some foreign venture capital
- PT Telkom is trying to capture most valued added services
- Urgent resolution of controversial regulatory issues and decisions needed

In general, Indonesia's universities are producing graduates who can enter this market, with some additional training required on new techniques and tools. Here again, the universities in Bandung and Jakarta draw attention, but approximately 2,000 students graduate from Bina Nusantara University each year in the ICT field.

The larger business community is increasingly deploying ICTs to improve internal operations and competitiveness. The investment climate,

however, is such that this expansion is somewhat hampered. Small and medium enterprises are just beginning to recognize ICTs (e.g., PCs, software, and training) as the price of entry, but ICTs are frequently beyond the means of these businesses, which do not have access to capital.

OVERVIEW OF INDONESIA'S ECONOMY

To a significant degree the economy of Indonesia is defined by recovery from the 1997-1998 financial and currency crisis. In 1999 the economy stabilized considerably because of tight monetary policies—the Government of Indonesia reduced inflation from 70 percent in 1998 to 2 percent in 1999, and the economy stopped its free fall as GDP started to grow in late 1999, though growth for the year was placed at zero. Growth for FY00/01 has been forecast at 3.8 percent. GDP (purchasing power parity) is placed at US$ 610 billion for 1999 resulting in a GDP per capita (again PPP) of an estimated $2,800 for 1999 and $2,940 for 2000. The labor force is placed at 88 million.

GDP composition by sector
Services—44 percent
Industry—35 percent
Agriculture—21 percent

The composition of the GDP by sectors is split between services (44 percent), industry (35 percent), and agriculture (21 percent). Indonesia's industries include petroleum and natural gas; textiles, apparel, and footwear; mining, cement, chemicals, fertilizers, and plywood; rubber; food; and tourism. Agriculture products include rice, cassava, peanuts, rubber, cocoa, coffee, palm oil, copra, poultry, beef, and eggs.

Exports in 1999 were estimated at US$ 48 billion, with commodities including oil and gas, plywood, textiles, and rubber. Imports were estimated at US$ 24 billion and included commodities such as machinery, equipment; chemicals, fuels, and foodstuffs. Import trading partners are Japan (17 percent), the United States (13 percent), Singapore (10 percent), Germany (9 percent), Australia (6 percent), South Korea (5 percent), Taiwan (3 percent), and China (3 percent).

ICT Sector

The chapter on Pipes provided a view of Indonesia's telecommunications sector (basic services, international, cellular, and Internet), and a comprehensive view of ICT as a subsector of telecommunications in Indonesia. The following sections describe other subsectors of the ICT subsector.

Computer Industry

"Internet/E-commerce Opportunities in SE Asia," an industry sector analysis (ISA) published in November 1999 by the U.S. Embassy in Manila and based on International Data Corporation data reflects the following IT statistics for Indonesia:

Indonesia's IT Statistics (US$ millions)

Computer Hardware/Software/Services	*1997*	*1998*	*1999*	*2003*
Multi-user Systems—servers	$ 100.8	$ 31.2	$ 61.1	$ 112.7
Single-user Systems—personal computers	$ 551.4	$ 83.5	$ 299.2	$ 568.4
Data communications equipment	$ 100.4	$ 44.2	$ 52.8	$ 167.9
Packaged software	$ 102.9	$ 21.3	$ 73.0	$ 154.6
IT services	$ 94.1	$ 33.6	$ 54.1	$ 167.8

According to ITU data for 1999, there are 1.9 million personal computers (PC) in Indonesia with a penetration of 0.9 percent. An ISA published by the U.S. Embassy in Jakarta in July 2000, estimates 2 million PCs, with 250,000 in homes. In 1998, the number of PCs sold dropped to 80,000 from 350,000 a year earlier, but sales for 1999 were estimated at 280,500. Estimates for 2000 were 352,410 in a Market of Opportunity Report (Indonesia cable from the U.S. Embassy in Jakarta, June 2000). There are six computer brands in Indonesia—IBM, Acer, Hewlett-Packard, Compaq, and two locally assembled brands, Zyrex and Mugen. An international market insight report, issued by the U.S. Department of Commerce in August 1999, says that in early 1999 locally assembled computers accounted for 55 percent of the Indonesian PC market share.

Internet-Related Services

In addition to basic Internet services such as Web hosting and e-mail, there is a growing interest in more sophisticated uses of the Internet. The July 2000 ISA report reflects that several IT firms are sponsoring seminars on the benefits of e-commerce and e-business. More Indonesian companies are going online, creating more demand for ICT-related hardware, software, and services. While many of these firms are doing some work in-house, others are outsourcing to the ICT sector, creating sector and job growth—not only for the ISPs, but also for firms developing more applications for online transactions.

The recent growth of young companies in the ISP, software, and Internet service businesses is supported by over 10 venture capital and incubator companies based locally and overseas in the United States, South Africa, Singapore, Hong Kong, Korea, and other countries in the Asia-Pacific region. Most foreign investors are motivated by Indonesia's potential market and location in a region that is rapidly becoming the epicenter of new global electronics manufacturing and software development.

Domestic conglomerates such as Lippo and Sinar Mas, as well as international companies such as IBM, Oracle, Sun Microsystems, Microsoft, and Compaq, are sponsoring software incubation, application service providers (ASPs), and e-commerce companies in Indonesia with an eventual aim toward initial public offering (IPO). IT businesses in Indonesia are clearly in an early stage, but most investors expect a good return in 2-3 years. E-commerce transactions in Indonesian are estimated to be worth US$ 0.25 billion in 2000, US$ 1 billion in 2001, and US$ 11 billion in 2005 (IDC, Goldman and Sach and Forrester). In addition, some local e-commerce companies have entered into strategic alliances with internationally known portals. For example, PT Indosat Com Adimarga (indosat.com and dagang2000.com) has entered into trade exchange agreement with China.com; PT Kopitime Dot Com (through biz-dunia.com) has joined with the Swiss-based Global Trade Point

Network (GTPN); and PT Global Jaringan and PT Indonesia Exchange is similarly tied-up with Hong Kong-based Globalsources and Nexiaonline (*Bisnis Indonesia* 02/05/01).

Human Resources

An ISA report issued in June 2000 by the U.S. Embassy in Jakarta expressed that while no exact statistical data on demand for IT workers in Indonesia is available, demand has recently increased, significantly so in big cities such as Jakarta and Surabaya. This demand is fueled by the ICT sector and by growing use of ICTs in other sectors. Growth has been attributed to the dotcom companies, but also to traditional companies developing web sites and e-business solutions. Medium and high-level expertise "computer programmers and technicians, web masters, network engineers, and technologically savvy managers" are especially in demand. Overseas job opportunities are also driving local demand. Several placement services are expanding overseas placement services to include IT professionals. In 2000, the Association of Indonesian Internet Service Providers (APJII) aimed to extend Internet access to 2,000 high schools. Called, "School 2000" or "SMU-2000," the project reached only 1,200 schools but was deemed a success. In 1999, the Bandung E-Commerce College was established to offer an 8-month certification program in e-commerce technologies. Again, the focus is on developing the industry and supplying it with quality IT professionals.

Non-ICT Sector

The non-ICT sector is rapidly adopting ICTs to improve productivity and customer services. Where automation is mostly internal it is termed "e-business"; where it is external, focused on business-to-business (B2B) or business-to-consumer (B2C), it is termed "e-commerce."

Like Amazon.com in the United States, one of the pioneers of e-commerce in Indonesia is Sanur, an online bookstore. According to an article on e-commerce in Indonesia[24] by Zuraida Boerhanoeddin of PT Indosat, Sanur is offering 30,000 books, has 11,000 customers, and already has up to 2,500 transactions per day. In 1997, a shopping mall, Indonesia Interactive (a service of INDOSATnet), was introduced with 10 online stores selling books, computers, handicrafts, and t-shirts[25]. Toko Buku Gramedia, the largest bookstore in Indonesia, is in this cyber mall. Citing data from Forrester Research, the report says that e-commerce transactions in 2000 were only US$100 million, or just 0.026 percent of the total, but are expected to reach US$ 200 million by 2001 and US$1.2 billion by 2003.

Other e-commerce portals include Kompas.com, Detik.com, Astaga.com, and Satunet.com—all having invested heavily in providing e-commerce solutions and a wealth of news and information around which their e-commerce services are placed.

In addition to the startups, larger, more traditional businesses are moving to the Internet and are investing in e-commerce facilities to augment core businesses with ICT services. These businesses include AGIS (Artha Graha Group), Asia Food and Properties (Sinar Mas Group), Astra Graphia (Astra Group), Lippo Life (Lippo Group), Metrodata (Metrodata Group), Sentarlindo Panca Sakti

[24] http://www.isoc.org/inet2000/cdproceedings/7c/7c_3.htm

[25] http://www.i-2.co.id

(Napan Group), and Multipolar (Lippo Group)[26]. The ISA further states that Indonesia Online (recently taken over by the M-web group), the parent company of Astaga.com, has allocated US$ 20 million to help entrepreneurs develop their Internet business. A number of e-procurement projects are in Indonesia already. For example, since 1999 the Sinar Mas Group (in cooperation with bidnets.com) is operating an e-procurement system for B2B transactions similar to Schlumberger's MarketSite, a U.S. company. This group is working with Commerce One (U.S.) and Nissho Iwai Corp. (Japan) to build an international B2B trade alliance. Likewise, PT Cisadane Raya Chemicals runs similar e-commerce technology (*Swa 21*, 10/19/2000).

The application of such systems and expansion of Internet facilities would open up possibilities and, when fully implemented, promises a more efficient market, ensuring the lowest price and speedy delivery. The argument that e-commerce will lead to higher profits will eventually win over SMEs to buying or selling directly because lower prices mean smaller profits for non-assembling suppliers, namely those who merely distribute products.

Partly as a result of the economic crisis, many Indonesian (particularly medium to large) companies are now realizing that to stay competitive and be global players, they must restructure operations to become more efficient. E-commerce solution providers are now heavily marketing their B2B services to the large businesses because they believe that these companies will bring SMEs into their e-commerce network. By establishing their supply chain, the large companies are providing the SMEs with an opportunity to use and benefit from e-commerce solutions.

Another traditional sector moving into e-commerce and e-business is banking. Bank International Indonesia (BII), an early adopter of the Internet, has 27,000 Internet banking customers. As reflected in the U.S. Embassy's ISA report, and according to BII, in February 2000 alone they recorded 15 billion Rp. of online transactions. Lippo Bank is also already online with Bank Danamon, Bank Central Asia (BCA), Bank Niaga, and Bank Mandiri, also moving rapidly to adopt ICTs, including the Internet, to extend services.

A small, but growing B2C activity in the non-ICT sector is underway in Indonesia. As in other Asian countries, the B2C market has been slow to emerge largely because consumers do not understand its value and are concerned about non-delivery and credit card fraud. Consumer preference for viewing and touching items before buying them and the lack of catalog shopping and phone orders also slow the transition to electronic purchase via the Internet. Large business groups, such as Lippo Group (lipposhop.com), have entered the B2C sector with limited success. PT Lippo E-Net is the first portal to focus on insurance. According to a survey by AC Nielsen in 2000, the most popular sites in Indonesia are those offering news, books, and souvenirs unique to Indonesia such as handicrafts, building materials, and data (statistics and report).

[26] Industrial Sector Analysis (ISA). U.S. Embassy, Jakarta. July 1, 2000.

ANALYSIS

Internet Consolidation and Acquisitions by Foreign Operators

Warnet or Internet cafes and kiosks are proliferating in large and medium sized cities in Indonesia but face tight competition. Despite high demand, especially by young students, a price war has reduced hourly rates from about Rp 12,000 ($ 1.26) to Rp 4,000 ($0.40). Some ISPs are trying to provide better services or diversify by providing free e-mail, web site design, or voice over internet packet (VoIP). The Indonesian Warnet Association (AWARI) frequently reports problems, such as restrictive government permits and regulations particularly on VoIP , which only PT Telkom and PT Indosat may now operate. As discussed earlier, there is some consolidation among ISPs with recent foreign takeovers.

Software House Bali Camp Model and Others Being Replicated

With only 50 programmers, a small company on Bali has been supplying software modules to global IT companies such as Microsoft, Oracle, Cisco, Allaire, IBM, and Smart. The company started in January 1999 with only US$1 million and US$2 million to build and has made US$2 million to date. Next year's revenue target is US$ 7 million. Other Indonesian firms also want to become software centers. Toba Camp in northern Sumatra is in the planning stage and there other viable software application development houses—Indonesia Software Exchange, DataOn, Jatis and others based in Jakarta and others in Bandung, Yogyakarta, Surabaya (main cities on Java) and Medan, Sumatra.

Industry observers suggest that English language barriers are lifting—thanks to the Internet. Jakarta-based IT recruitment firms that sent programmers overseas at the height the 1998 financial crisis, when bankrupt firms laid of employees by the dozen, can now barely meet demand from firms in the region, as well as the United States and Europe.

PT Telkom is planning to open an IT training center in Bandung, West Java, in 2001 and is already operating a research division (RisTI) in Bandung which is venturing to software development (while 60 per cent of its revenue comes directly from internal PT Telkom contracts). And Indian companies also see Indonesia's potential. LCC Infotech, an Indian IT firm, opened a $5000 million training center in Jakarta in October 2000 (*Bisnis Indonesia* 02/05/01).

Opportunities for Foreign Companies

Notwithstanding political and investment uncertainties, industry players suggest that the best market entry strategy for foreign firms is to form a partnership or alliance with an Indonesian ICT firm, and work with them to develop their market niche, whether corporate or consumer. Since many ISPs are providing basic services, there are good opportunities awaiting those who can provide expertise to deliver enhanced and quality services, especially in web hosting and Internet solutions.

In the area of ancillary products, many Indonesian non-ICT companies that are looking to Internet and e-commerce solutions must become more IT-capable and obtain better hardware. The market for PCs, modems, and computer software programs that will enable companies to become more productive and efficient is expected to grow. For example, PT Compaq Computer Indonesia is targeting a 30 per cent increase in revenue for 2001 which is higher than the projected market

increase of 20-23 per cent (IDC quoted in *Bisnis Indonesia* 01/29/01); and about 75 per cent of PT Compaq's revenue comes from non-PC income comprising enterprise solutions and services. According to the IDC data, the 1999 revenue of PT Compaq—the market leader in Indonesia—was $62 million, but this makes up only 8.7 per cent of Indonesia's total market. So there is plenty of room for new competitors in this market.

The possibility of Japanese and German government-funded programs establishing manufacturing plants of set-top-boxes has recently been reported. These devices allow broadband access to the Internet through cables that preclude the need for PCs. Following the success of such decoder devices in Taiwan, China, and South Korea, PT National Gobel and its joint-venture partner Matsushita is likely to be the first to start producing devices under these programs. According to Asia Market Intelligence (AMI) Business Consulting data, the Indonesia sale of set-top-boxes in 1998 was about 8,000 units (compared to 2,243,800 TV units) but is projected to increase to 75,000 units in 2002 (*Bisnis Indonesia* 02/08/01).

Serious Infrastructure Constraints

In considering prospects for development of the ICT industry, entrepreneurs and observers identified infrastructure (e.g., network infrastructure and the existing market structure of the backbone) as the most significant impediment to providing efficient, low-cost telecom service to the ITC industry and to individual users. Internet access, for instance, relies primarily on telephone lines and the result is relatively high cost and slow speed access. These constraints are worsened by the slow pace of reforms and by the incumbent carrier attempting to dominate most market segments.

Software and Service Provider SMEs Face New Taxes on IT Products

The nascent software and service provider sector is now facing new taxes. Recently the Ministry of Finance (apparently without consultation with MOC or MOCT) announced an increase in the tax on luxury goods (*PPn BM*) on electronics items, including TVs, household appliances, computers and IT products (magnetic tapes, CD-VCD and LD drives, wireless modems). The tax now ranges from 20 to 75 percent, up from the previous 5 to 20 percent.[27] While this does not contravene the spirit of the International Technology Agreement, which states that all tariffs (not luxury good taxes) on such products should be lowered to zero (in Indonesia, the tariffs of electronic goods range between 0 and 5 per cent), the new ruling is bound to increase illegal smuggling or under-invoicing practices, which would make local assembly or manufacture less competitive (*Bisnis Indonesia*, 02/05/01). In addition to the luxury tax, IT products are also subject to value added taxes (*PPn*) of 10 per cent and income

[27] Commentators suggest that the new revenue-raising policy is ill-considered since there are many electronics products that should not be classified as 'luxury' products such as IT products subject to 20 percent tax (previously no tax)—PCs, laptops, cellular phones, land-line handsets, telex and facsimile machines, wireless modems, pagers—as well as hardware components such as magnetic tapes, monitors, CD/VCD/DVD players. While the luxury tax color/BW TV sets of less than 17 inches was lowered from 20 to 0 percent, there for TV sets of greater than 17, 21, 29, 34 and 43 inches are subject to 10, 20, 30, 40 and 50 percent tax, respectively, regardless of their technology. Newer more expensive plasma-glass flat-panel TVs command the same rates as the more conventional categories.

taxes (*PPh*) of 2.5 per cent. Such taxes do not make sense to the ICT businesses and community at large when PC penetration is only about 1 per cent of the total population.

In contrast to the tremendous dynamism of the private sector involved in ICT businesses, the government is often viewed as 'blundering' or 'badly muddling its way through' when formulating policy on telecommunications regulation or laying of the foundation for 'cyberlaws' in Indonesia.

Under the Suharto regime indigenous businessmen worked closely with the Suharto family and received very favorable contracts with large foreign vendors. Since 1996-1997, however, such vendors have became increasingly wary in dealing with such businesses and have sought other partners. Once the Suharto government lost power, and after the financial crisis in 1997-1998, many contracts with the Suharto family businesses had to be renegotiated.

Such private businesses and bureaucrats from the old regime are still around and many observers suggest that they often attempt to become part of the new 'reformed' system by using reformist rhetoric while sabotaging or delaying the 'disintermediation'—the cutting out of the middleman. Of course those threatened by disintermediation will not stand idly by, but will use all means—judicial, regulatory, and legislative—to thwart competitors who would like to use the Internet to sell a product or service. Those who benefited from the Suharto family's business connections are also reappearing in the Indonesian Internet business community but are very sensitive should their past practices be revealed.

Resistance to disintermediation is potentially affecting a wide range of ICT and other industries and professions. For example, distributors and retailers of physical goods automobiles, electronics, and music (with standard features); services such as travel, banking, and stock trading; and doctors and lawyers. Government services in particular could benefit from disintermediation.

In Indonesia, there is little tradition of businessmen taking legal recourse. For example, a Ministerial Decree (by the then Ministry of Investment and State Enterprises No. 96/ 2000) banning or tightly controlling new foreign investment in multimedia services business was reversed only after much protest from industry lobby groups. In such cases, those adversely affected should file a class action suit. The state administrative watchdog (*PTUN*) should have been consulted, but such bodies are still ineffective. As is often the case, the President simply reversed the order within two weeks and there was no due legal process. Some credit in reversing this decree goes to industry and umbrella associations such as MASTEL, Kadin Telematics and the *Indonesian Internet Industri Forum* – FIII. Now these groups are brought together in the National Telematics Movement (*Genetika*) and this provides some optimism that there will be a better ICT industry advocates in the future.

The proclamation of *Genetika* was made on January 19, 2001 with several government officials present providing ceremonial approval (MOC, MOIT, Research and Technology Ministry (*BPPT*), Education and Justice ministries) but they did not provide official, written support. The event was sponsored by the private sector (Aspactel 2001 conference organizer sponsored the event). Similarly, the KADIN compartment Telematics (which comes under the Division of Telematics, Postal and Mass Media) constitutes a number of prominent IT sector young entrepreneurs who are organizers of leading industry organizations. As these events were very recent it is too early to say how effectively these associations and organizations can lobby the government in Indonesia.

Despite unresolved issues and impediments, the outlook for the private sector ICT businesses in Indonesia is optimistic. Impediments include a lack of effective cyberlaw that can guarantee e-

commerce; looming market correction among many online businesses; adverse international perception of Indonesia's political climate; a limited number of Internet users; and a dotcom boom at least 2 to 3 years away. What are the reasons for optimism? First, the total population is 220 million; if Warnets and ICT expansion programs maintain their current rate, growth will increase drastically in the next few years. Second, medium and large businesses in Indonesia are aware that ICT-based businesses are the wave of the future. Third, ICT vendors, domestic and foreign, are continuing their market expansion programs and believe that Indonesia's location in the growing Asia Pacific region offers much potential.

5. People

This chapter analyzes and makes recommendations on using ICT technologies internally at USAID/Indonesia, across Indonesian society, in USAID programs across all strategic objectives, and specifically in USAID's democracy, governance, and civil society strategic objective. To some extent, this chapter also integrates the findings and analyses of the previous chapters with USAID's current development portfolio as a foundation for ICT recommendations

SUMMARY

ICTs can be a pillar for broad political, social, and economic development in Indonesia. A new national ICT framework recognizes this potential. But actual use is at a nascent stage in Indonesian society and USAID programs. When benchmarked against other Asian countries and ASEAN neighbors in particular, Indonesia does not perform well. Most Indonesian users are, not surprisingly, young and urban elite. There is little web content that on Indonesia, and English language barriers inhibit the value of the Internet to the general Indonesian speaking population.

The Pipes problems noted earlier (which in large part is due to policy constraints) is a major factor limiting ICT use in Indonesia. But use is also restricted by low levels of *awareness, mastery, and content* that effectively limit the utility of the Internet in Indonesia. Thus, even within the limited ICT infrastructure, the Internet, for instance, could be much more widely used. We offer a three-pronged approach for realizing this potential—access, mastery, and content.

Access means increasing the ability of Indonesian development partners to log-on the Internet with better quality of services. The greatest gains in increasing access and reducing costs is by following the policy prescriptions noted earlier, and we recommend USAID economic growth programs do what they can to address the most pressing policy constraints. At the same time, USAID programs and partners can also increase access through program interventions and use of telecommunications technologies. These access solutions will depend on whether USAID programs are operating on or off the telecommunications grid. In more densely populated regions of Java or Sumatra, for example, improving access can simply mean ensuring USAID programs and partners have computers and modems, can utilize other public facilities, develop public and private partnerships, or that they themselves can serve as public facilities for the wider local civil society community. Off the grid, in isolated regions, some combination of low-cost, satellite-based Internet access coupled with wireless local and wide area networks can "wire" a community very quickly. We recommend pilot projects to this effect in the context of USAID's outer island focus on Aceh, Sulawesi Utara, Kalimantan Timor and Irian Jaya.

Mastery means increasing awareness about the Internet and the ability to use computers, email, and the Internet among all USAID programs and partners. We suggest three levels of education and training—awareness raising, Internet for novices, and Internet for professionals. There is not much

appreciation for how the Internet can transform society, programs and professions. Political leaders, policymakers, and program managers can benefit from understanding the strategic value of ICT. Seminars, workshops, study tours and media campaigns can all be useful in increasing awareness. The Internet for novices would be 1 to 2 day training sessions on how to turn on a computer, send emails and attachments, and surf the web taught by IT professionals. The Internet for professionals would be 1 to 2 week hands-on workshops on how to be a more effective professional by use of the Internet and would be taught by someone from the targeted professional. For example, a two-week, "The Internet for Agricultural Economists" training program can help Indonesian agricultural economists become more proficient on use of the Internet. The program can demonstrate how to find international agricultural trade statistics, how to download statistical software, how to discover international weather patterns and conditions, how to research the sugar crop in the Philippines or the cotton crop in Egypt. Such a program would be most effective when led by agricultural economists who know about these matters.

Content means the material and application of the Internet specific to Indonesia and in the Indonesian language. There is a wealth of information on the Internet in English, but much is not relevant to Indonesia nor understandable by a population that does not understand any English or that has limited ability to do so. Content across all USAID SO sectors needs to be developed to target particular audiences—the general public, specific sectors (e.g. public health), specific professions (e.g. commercial lawyers). We suggest a multi-donor approach and commitment to support all efforts to publish relevant materials on the web, and in Bahasa Indonesia. Some English text may need to be translated. For example, there are excellent English guides on disaster/refugee situations that could be an immediate resource for relief workers in Indonesia if available on the web (and if such workers were aware of it and how to access that information). Contracts, grants, and general support to Indonesian partners should encourage the wider dissemination of materials on the web.

These three approaches, *access, mastery, and content*, need to be integrated in a coherent whole. There is no use in training partners on the use of the Internet when they lack computers, or in encouraging Indonesians to go online when there is little material relevant to them or in their language. One good start would be to inventory ICT access, mastery, and content against a best practices comparison to benchmark Indonesian ICT program applications. Presenting findings in workshops would help create a multi-donor and multi-partner approach to addressing the ICT needs in a particular SO sector. Or, taking a geographic focus, a more multi-SO sector, multi-donor survey of ICT in a particular region can lead to pilot projects that link locations and activities in an information society. This geographic approach fits nicely with Indonesia's recent efforts in decentralization, a major cross cutting theme for the USAID Mission.

ICT AT USAID/INDONESIA

The focus of the fourth "P," People, in this assessment is the application of ICT technologies in USAID programs and among its development partners. A number of concerns were voiced.

There is no focal point at USAID for examining the potential to harness ICT technologies to help the Mission achieve its strategic objectives. To date, use of ICT is based on a "champion" or "hobbyist" approach whereby some managers have a personal interest in the Internet and seek to incorporate ICT into activities and programs. USAID's Data Management Group, which has the technical capabilities and interest in ICT, focuses primarily on internal use and not on application in programs and activities.

People Findings: USAID and Partners

- No USAID focal point for program use of ICT
- Some internal Internet connectivity issues
- USAID-Partner use of ICTs for coordination is primarily email
- Need for general training on Internet
- Need for specialized sector-specific use on Internet

The Program Office at USAID/Jakarta is charged with organizing and publishing the Mission's web site (http://www.usaid.gov/regions/ane/newpages/one_pagers/ido.htm) and is significantly upgrading that site (http://www.usaid.gov/~sgruber/indonesia). But here the objective is to explain the USAID program to outside audiences, not to use the web site to support strategic objectives. This assessment is a first attempt at systematically examining ICT potential across programs, but it is a one-shot assignment with no clear sustainability.

The Internet is used at USAID primarily for communications internally and with key partners via email. At present USAID/Jakarta acquires its Internet connectivity via linkages through the Diplomatic Telecommunication Service-Program Office (DTS-PO). The Mission's VSAT is used only for backup in case of failure, and even then USAID/Washington staff must handle the switchover. As it is, all Internet (and e-mail) traffic must go through Washington, even when the source or destination is in Jakarta. As a result, routing and performance are less than optimal.

With the expanded use of the Internet in carrying out the Mission's business, including improving the linkages with its development partners, there is the need for expanding the Internet capacity. This can be accomplished by making use of the VSAT (perhaps in parallel with the current use of DTS-PO circuits) and establishing a local Internet link (either via a leased line or cable).

At USAID the Internet is used for little except email. This is typically one-to-one, though e-mail distribution lists are used to broadcast messages. When it comes to establishing a shared calendar or sets of information, these systems simply do not have the needed capabilities.

Many have indicated a very strong interest in training—technical and programmatic—in ICT. The Assessment Team understands that the Mission will be increasing its Data Management Group staff and that this will permit more internal ICT training. This can address the need for technical training, but not the mastery of the Internet for professions. The Assessment Team recommends that such training be built into programs and activities.

INTERNET USE IN INDONESIAN SOCIETY

Bahasa Indonesia, the national language, unites the country's ethnic and linguistic groups and Indonesia has worked hard to achieve a high rate of literacy. A common language and literacy offer a good foundation for information and communications technologies. But who uses the Internet today? *Tempo* magazine surveyed Internet users on February 10-19, 2000 in the three largest Internet markets—Jakarta, Bandung and Surabaya. The more telling demographics of Internet users are that:

Half of Indonesia's Internet users are between the ages of 21 and 25.

About 62 percent use Internet kiosks to connect to the Internet.

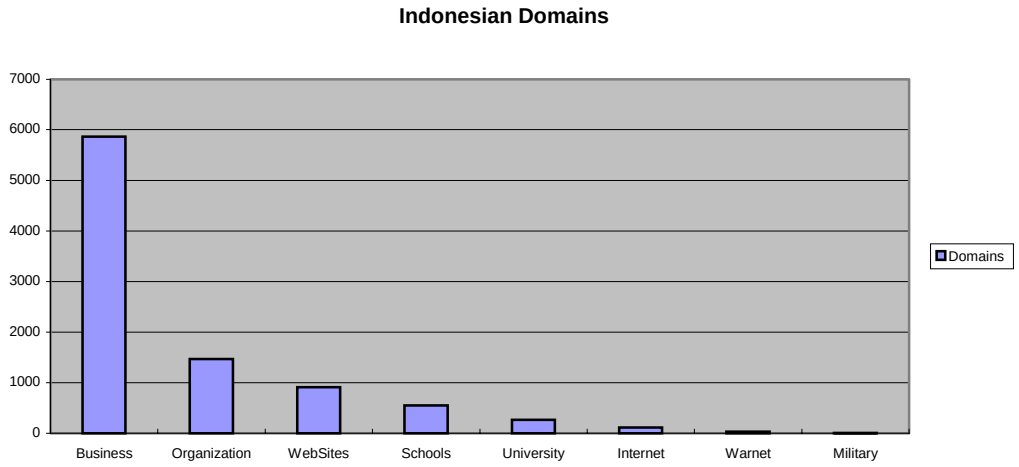
The most frequently used international portal is Yahoo.com and domestic portal is Detik.com

Seventeen percent use Telkomnet as the ISP, which permits inexpensive, fast, and easy access to the Internet (no registration, membership or monthly fees).

People Findings: ICT in Indonesia

- Low Internet use compared with Asia and ASEAN
- Mostly young, urban users
- Little Indonesian web content: information, language, applications
- E-commerce most advanced
- E-government just beginning
- E-professions likewise limited
- Constraints—access, awareness, mastery, content
- Some socio-cultural factors

But what content is available about Indonesia for these users? According to the Indonesian Network Information Center[28], Indonesian local domains increased from 86 in 1995 to 9,223 as of January 2001. The following chart indicates how business applications dominate Internet use in Indonesia. (These figures[29] under-represent Indonesian content on the web because Indonesian entities also register internationally, such as dot-coms, dot-orgs, and do-nets.)



As this chart shows, the private business community was an early adopter of Internet technologies in Indonesia. On the other hand, Indonesia is at a very early stage of e-government. Several national government agencies have LANs and a few have WANs. Email connectivity is not widespread, and actual access to the Internet is limited to senior government officials. Few government agencies have capability beyond offering public information over a web site in a one-

[28] http://www.idnic.net.id

[29] Universities (ac.id); schools (sch.id); business (co.id), organization (or.id); Internet (net.id); military (mil.id); warnets (war.net.id); and websites (web.id). Government domains end with go.id but IDNIC does not keep those statistics.

way mode of communication. Each government ministry manages its ICT equipment and systems. Most USAID partners (contractors and grantees) report that their government counterparts are generally well behind their own utilization of ICT in carrying out responsibilities. Some government agencies have been more progressive. For example, BPPT has been a champion of ICT, given its science and technology orientation and its IPTEKnet Internet access services to the science and technology and higher education establishment in Indonesia.

Most local governments are ill prepared for e-government, lacking computers and Internet access. USAID staff, contractors, and grantees report that while there is some capacity at the provincial level, lack of computers, facilities and telecommunication services plague the *kabupaten/kotamadya* or district levels of local government. There are exceptions. Some West Java kabupaten are reported to be "e-ready." The Kabupaten of Takalar in South Sulawesi is known for its visionary use of ICT.

Professional use of ICT is also believed to be at a nascent stage in Indonesia. Little academic preparation is available (beyond those in the engineering/computer disciplines and at certain outstanding universities and departments). Some limited in-service, training has been reported but not enough to have a significant impact on any profession. What ICT has been adopted has been, again, on an individual "champion" or hobbyist level.

Why has Indonesia been so slow to adopt the Internet? This is explored in detail when we examine individual USAID programs, but the same constraints apply—lack of access to computers and the Internet; limited awareness and mastery of the medium; and little content of relevance to Indonesians and speakers of Bahasa Indonesia.

Other reasons are socio-cultural—the equating of information with power, a desire for less openness, comfort with ambiguity and unease with clarity, a managerial culture that values hierarchy and seniority, and other traditional values. While the Assessment Team acknowledges that there may be some merit to these "softer" explanations, we also note that some of Indonesia's neighbors who share socio-cultural norms (i.e., Malaysia, Thailand, the Philippines and India) have become more "e-ready" than Indonesia. Thus, these socio-cultural constraints do not appear to be as compelling as some suggest.

USAID/Indonesia Program and ICT Utilization

For purposes this assessment, the Mission's program was briefly examined from two perspectives. (1) Can ICTs be leveraged to enhance the effectiveness and efficiencies of the Mission's current activities? (2) How do findings and analysis of the policies, pipes, and private sector link with current USAID programmatic activities? This review took into account the current level of ICT deployment as understood through meetings with each SO Team as well as with discussions with approximately two USAID partners for each SO. Further, we met with USAID's newly formed regional teams focusing on East and West Java,

USAID/Indonesia Strategy Objectives

- Democratic reforms sustained and Deepened
- Decentralized and participatory local government
- Foundations set for rapid, sustainable and equitable economic growth
- Energy sector governance strengthened
- Decentralized and strengthened natural resources management
- Health of women and children improved
- Impact of conflicts and crises reduced

Aceh, Sulawesi Utara, East Kalimantan and Irian Jaya.

In reviewing the Mission's program, we found several broad areas where ICT-related activities discussed in earlier chapters intersect with the Mission's development portfolio. Clearly there is the need for continued telecommunications policy reform to expand economic growth in Indonesia. In addition, there is the opportunity to assist in the area of transparency with increased reliance on providing expanded information and government services via the Internet.

The following provides a brief description of USAID/Indonesia's new Country Strategy, entitled "Transition to a Prospering and Democratic Indonesia". We summarize each of the Strategic Objectives, briefly describe the general uses of ICT encountered for each SO, plans for the future, and other opportunities to strengthen these programs by better harnessing the power of ICT. More attention is given to the democracy and governance strategic objective (due to the terms of reference for this assignment) and this analysis follows at the end of this section.

The USAID Country Strategy covers two periods over a five-year span. During the first three years (2000-2002), USAID will concentrate heavily on needed legal, policy, regulatory and institutional reforms to sustain democracy, establish a functioning market economy based on predictable rules, emphasize assistance to vulnerable populations, and focus on efforts to bring the accelerating destruction of natural resources under control. Assuming the political situation stabilizes, during the final two years (2003-2004), greater assistance will be devoted to developing institutional capacity of national and local governments and civil society groups. Support for civil society is expected to be constant throughout the strategy period.

Decentralizing Government Authority

Strategy. USAID will assist the Government of Indonesia to establish a legal, regulatory and fiscal environment that enables local government to be effective and help local governments to develop capacities needed to manage resources and services effectively and to develop skills needed to engage citizen participation. Included is assistance to independent associations of local governments and officials to become sustainable sources of ideas, best practices and advocacy. USAID will work within the six regions noted earlier for geographic concentration.

Key Results: Four key intermediate results will be pursued: (a) Establishing an enabling legal and fiscal environment; (b) developing local capacity to effectively deliver services; (c) developing mechanisms and practices that enable local participation; and (d) developing sustainable and independent associations that advocate for continual improvement of local governance.

ICT Utilization: There is little known utilization of ICT technologies in this program to date, based on meeting with the USAID DLG Team and the two partners noted below. The Clean-Urban project had a web site at one time but it was not maintained. RTI contributes to a newsletter that GTZ publishes on the Internet.

Potentials: However, there is near universal agreement that this strategic objective could benefit greatly from the utilization of ICT. This observation was made not only by USAID's DLG Team and partners, but also by long-term observers of developments in Indonesia. The overriding need to increase capacity of local governments to handle their new regional autonomy responsibilities is a serious concern in Indonesia. ICT technologies, primarily the Internet, can help disseminate regulations, implementation instructions, technical materials, and best practices. The Internet can also

improve communications between the center and local governments and among local governments. Opportunities for distance mentoring and distance learning are also significant. The Internet can also increase public transparency and accountability, key features of USAID's DLG interventions.

USAID's two main vehicles for carrying out decentralization activities are the Pemda Sukses program managed by the International City/County Managers Association (ICMA) and the Clean-Urban Program managed by Research Triangle Institute (RTI). Both institutions have ICT capabilities that can be applied to activities in Indonesia.

ICMA is particularly well placed in its work with local government associations (provincial, kabupaten and kotamadya) that can utilize ICT to address the pressing needs of local governments in Indonesia. At the same time, RTI could assist by disseminating its Capital Improvement Program methodologies over the Internet, along with success stories and best practices.
Having said this, there are also formidable challenges to local governments utilizing ICTs more effectively. Following the three-pronged approach:

Access: As noted earlier, this is a significant challenge. While the Government of Indonesia provided computers to all kabupaten/kotamadya several years ago, many are reported to be out of operation. Skilled manpower will be in short supply the further local governments are outside of Java. Access to phone lines will also be limited, particularly on outer islands.

At the same time, creative approaches to improving access can be explored. Local governments will obtain additional revenues from the central government. The price of one new vehicle can be used to purchase several computers, establish a local area network, and obtain Internet access. This suggests that work to increase awareness of the benefits of ICT and tradeoffs with other capital expenditures should be considered. Further, public and private partnerships may be used in creative ways. A large computer manufacture and Internet service provider might consider donating computers to local governments in exchange for multiyear subscriptions to Internet service. Solutions for "off-grid" locations are discussed elsewhere.

Content: This is an ideal opportunity for the three national associations to provide services to their local government members. These three associations can be given grants to publish relevant information as noted above, in Bahasa Indonesia, on the web so that it is readily accessible by local governments. A prioritized listing of important information, reports, regulations, and forms should be developed and published by these associations to make the Internet a useful tool for local governments in the new era of decentralization.

The Internet's ability to add public transparency and accountability is one of its more useful functions. USAID could work with some pilot local governments to develop model web sites that lead to greater transparency and accountability to local citizens. Civil society organizations could be provided grants to develop methodologies and publish comparisons on the web regarding the degree of good governance across local governments. A business-oriented CSO could develop a methodology and publish comparisons of domestic and/or foreign investment environments. These comparisons can lead to healthy competition among local governments with respect to good governance and good business practices.

Mastery: This is another challenge that needs to be addressed before ICT can be a fully effective tool to support decentralization in Indonesia. Of the three types of mastery noted earlier (awareness, the

Internet for Novices and the Internet for Professionals), the first two are particularly relevant for local government officials. Again, the local government associations could be used to develop and offer ICT training modules for local government officials.

Supporting Economic Growth

Strategy: USAID will work closely with donors to assist the Government of Indonesia to implement its economic reform program and build effective institutions. This includes establishing sound economic policies administered by strong executive institutions; investment-friendly legal and regulatory frameworks enforced by Independent Regulatory Commissions; open access to the opportunities created by a growing economy to all Indonesians; and participation by intended beneficiaries, legislators and government officials to provide legitimacy and support.

Key Results: Four intermediary results are targeted: (a) sound economic policy and institutions; (b) a conducive legal and regulatory framework; (c) open access to economic opportunity; and (d) knowledgeable public participation in economic decision-making.

ICT Utilization: The economic growth portfolio has the greatest opportunity to improve the utilization of the Internet in Indonesia's political, social and economic development. As noted earlier, there are a number of policy constraints regarding the structure and operation of the telecommunications industry that must be addressed if Indonesia is to make significant progress in bridging the digital divide. Further, there are legal constraints facing the further growth of e-commerce in Indonesia that are in need to attention. Fortunately, all these areas are being addressed in some way by USAID's economic growth program. The recommendations in other sections suggest an intensification of such efforts.

But beyond policy, the fourth "P" (people) examines utilization of Internet technologies themselves to strengthen economic growth programs. The following table lists web sites that have materials relevant to these programs.

USAID Economic Growth Partner Web Sites

No.	*Organization*	*Website*
1.	Udayana / USF - Center for Commercial Law and Economic	www.cclebali.org
2.	Partnership of Economic Growth	www.pegasus.or.id
3.	Columbia Univ. - Center for Strategic and International Studies	www.columbia.edu/cu/csis/
4.	Georgetown Univ.- Partnership for Business Competition	www.businesscompetition.org
5.	Univ.of South Carolina - Jakarta Stock Exchange	www.jsx.co.id/ncgcg/
	Law & Finance Institutional Partnership	www.hukumonline.com
		www.pps.ui.ac.id/ppsui.htm
6.	University of Indonesia	www.ui.ac.id/HTML/MENU-SHTML
7.	Univ. of South Carolina	www.sc.edu/index.html
8.	David Linnan	www.law.sc.edu/linnan
9.	The Asia Foundation	www.asiafoundation.org
10.	Persatuan Untuk Pengembangan Usaha Kecil (PUPUK)	www.pupuk.pair.com
11.	Akatiga	www.akatiga.or.id

No.	*Organization*	*Website*
12.	Jakarta Initiative Task Force (JITF)	www.jitf.or.id
		www.padcoinc.com
13.	Jakarta Future Exchange	www.bbj-jfx.com
14.	Indonesia Bank Restructuring Agency (IBRA)	www.bppn.go.id
15.	DAI-Food Policy Project	www.dai.com
16.	Global Technology Network	www.tmiconsulting.com/GTN

The economic growth portfolio consists of 32 activities, some of which are grouped together. A number of these activities have incorporated ICT to achieve their various objectives. Examples include:

Georgia State University is planning to introduce the internet and video conferencing in their education programs;

The ELIPS Bridge activity is utilizing remote learning for legislative drafting;

An Emerging Markets Development Advisor has been requested to work with The Asia Foundation on SMEs and the Internet;

The University of South Carolina is working on teleconferencing courses in good governance and stock options with the University of North Sumatra;

The PEG Annual Economic Leadership Conference (May, 2001) will focus on policy issues concerning ICT in Indonesia;

A new food policy project will introduce a web site pertaining to its activities; and

The Global Technology Network introduced an online SME registration process.

Two USAID economic growth programs were surveyed: The Partnership for Economic Growth (PEG) and the Global Technology Network (GTN). The general sense is that some PEG linkage grant partners have been innovative in introducing ICT into their program components (e.g. Columbia, Georgetown and South Carolina Universities). At the same time, the large technical assistance advisory component has approached its work in a more traditional fashion. The Global Technology Network is attempting to direct part of their program to domestic trade in Indonesia, as well as the regular GTN orientation towards technology transfer with the United States. GTN introduced a web-based registration form for Indonesian SMEs one-two months ago. Of the two hundred companies that have registered thus far with GTN, only one registered online. According to the GTN program managers, Indonesian SMEs are reluctant to use the Internet and will often travel from other cities in Indonesia to register in person at the GTN Jakarta office, although they knew about the possibility of a web-registration. GTN program managers sense that a lot of "socialization" is necessary before Indonesian SMEs fully appreciate the efficiencies afforded by ICT.

Potential: The Internet can be a very effective tool to strengthen economic policy programs. A three-volume, ten-month study of best practices conducted by Assessment team member, Steve Mintz, for USAID's Center for Economic Growth (visit USAID's Office of Emerging Markets, Center for Economic Growth, website for the full report) amply documents how economic policy

programs have been strengthened by the ability of the Internet to assist economic reformers to carry out economic research, add to public transparency and advocacy, conduct professional and institutional networking, receive distance consulting, and , very importantly, participate in distance learning.

Some examples of how ICT could further strengthen economic reform programs in Indonesia include:

Access. The Institute of Technology in Bandung (ITB) and the University of Indonesia (UI) have installed VSATs to facilitate Internet access. Students are charged an additional fee to cover the costs involved. This business model is considered to be successful. USAID could follow this business model for installing VSATs at other regional universities in Indonesia, permitting their economic (and other faculties) to benefit from greater access to the global information highway. PEG linkage grants with economic faculties in the US could assist educators on effectively utilizing the Internet for instruction and for economic research. This could have an immediate spillover effect to provide more regional talent to assist local governments as they assume greater autonomy during the decentralization era.

Mastery. PEG might consider conducting periodic seminars and workshops for economists on how to more effectively utilize the Internet. For example, Michigan State University has a two-week course on "The Internet for Agricultural Economists". It teaches agricultural economists how to be more effective by using the web; such as how to find international agricultural trade statistics, download statistics software, research weather patterns; and discover the conditions of the cotton crop in Egypt or the sugar crop in the Philippines. A wide variety of economic disciplines could be covered in a series of workshops. This could help to lead to sustainability for when the PEG technical assistance group winds down.

Content. PEG already publishes copies of its reports on the Internet. As reported above, a number of PEG linkage grants utilize the Internet to publish content and conduct operations, such as training. However, a more systematic assessment might be made on what Indonesia-specific content in Bahasa Indonesia should be published on the Internet. Universities, the Ministry of Finance, Bappenas, and the Ministry of Industry and Trade could be assisted to develop ICT strategies to make the Internet more useful to Indonesia. Colleagues from counterpart USG agencies in the US could be invited out to increase awareness of these possibilities.

Content useful to Indonesian SMEs might also be examined. The Emerging Market Business Advisor, for example, could look for ways for the Internet to become more useful for Indonesian SMEs. Information on marketing of handicrafts, appropriate technology, market prices, and business information and processes (e.g. online registration which we understand is just beginning in Indonesia) are all examples of content that could be of interest to SMEs.

Further innovation on using the Internet to foster PEG-like institutional relationships could be examined. USAID/Washington has an agreement with the US Securities and Exchange Commission to provide online advice to capital market authority partners. Similar arrangements for online mentoring relationships might be feasible.

Strengthening Energy Sector Governance

Strategy: This strategic objective aims to result in a more efficient and equitable energy sector. The strategy will minimize the role of the government as a regulator, maximize the role of the private sector as an owner and operator, maximize the benefit of energy natural resources, increase access to reliable and quality energy services and products at affordable prices, and internalize the "polluter pays" principle in energy pricing.

Key Results: The strategy has three intermediate results: (a) Energy sector reform implemented; (b) broader and more knowledgeable participation in energy sector reform; and (c) environmentally friendly investment in and management of the energy sector increased.

ICT Utilization: USAID's Energy Policy Analysis Office (EAPO) intends to establish a multi-region network on regional energy analysis and policy development. The purpose is to enhance the capacity of the respective regions and district/local governments for addressing energy issues of interest to them and to improve the coordination and interaction within the regions and with the central government. There are plans to incorporate ICT technologies to carry out this program. Email discussion groups began with eleven universities just this past September. Some members are active but others are not. Speaking with EAPO staff, the Assessment team learned that there are plans to establish an EAPO web site in the future. EAPO staff also felt that the Internet could be very useful in carrying out energy research and for distance learning (*klas jauh*). However, because the Ministry of Education has not yet decided on accreditation, Indonesian academic institutions are reluctant to devote much effort to developing web education programs.

Potentials: ICT technologies could play a supportive role in the EAPO regional policy analysis program. However, the Assessment Team was not able to learn enough about the program to make concrete suggestions. General thoughts, however, include the following:

Access. Apparently the eleven regional universities are already able to access the Internet. To the extent that they will work with provincial and kabupaten governments, an analysis will need to be made whether these local government partners have access, and the extent to which they really need such access if their regional university partners are able to access the Internet.

Mastery. The EAPO staff interviewed felt that this is the weak link in utilizing the Internet for regional energy policy analysis. If this is correct, professional level training on how to use the Internet to carry out energy policy and planning analysis might be useful.

Content: There are reported to be a number of Indonesian web sites with energy information. Among them are the government sites (http://www.dpe.go.id and http://www.bppt.go.id) and the private energy news web site (http://www.minergynews.com). EAPO may wish to analyze whether additional information, reports and analysis relating to energy policy analysis in Indonesia would be useful. If so, the EAPO web site might want to focus on appropriate content. The EAPO staff interviewed believed that the main readers of energy policy materials could do so in English. This assumption might be examined in more detail.

Improving Natural Resources Management

Strategy: The Strategic Objective is to promote more transparent, accountable, inclusive and empirically based natural resource related decision-making. A sector approach of relatively

independent activities in forestry, coastal resources, and protected area management is replaced with a more integrated strategy that responds to current evolving national policy processes as it relates to management of these resources. Best practices and decentralization of natural resources management plays a greater role.

Key Results: Three intermediate results are: (a) Clarification of roles and responsibilities for natural resources decision-making and management; (b) capacity of local stakeholders to manage natural resources improved; and (c) establishment of broader and more knowledgeable public demand for sustainable natural resources management.

ICT Utilization: Two USAID activities were reviewed: EPIC's Natural Resources Management Program (http://www.nrm.or.id) and the Indonesia Coastal Resources Management Project (http://www.indomarine.or.id). EPIC is engaged in coordinating efforts on policy, forestry, protected area management, biodiversity protection, coastal resources management, and activities of the World Wildlife Fund, Conservation International and the Nature Conservancy. The Coastal Resources Management program is a cooperative agreement with the University of Rhode Island to administer the Indonesian Coastal University Network (ICUNE). These two programs have utilized ICT technologies to a very significant extent to implement their respective programs.

Every week, EPIC sends an email to 318 members of their network that includes donors and Indonesian and international NGOs and other environmental partners. The email list includes news clips on significant events in the natural resources management sector of Indonesia. Many of the news items are assembled by a partner in the Netherlands. EPIC also manages the natural resources management website noted above. Although EPIC doesn't keep statistics, the readership is understood to be environmental NGOs (half Indonesian, half international), universities, and U.S. professionals. EPIC maintains offices in a number of outer island locations that have Internet access, but very poor quality of service.

The University of Rhode Island program maintains an online network and paid for Internet service for its university partners for three years. The hub of this network is at the Institut Pertanian Bogor (IBP). Great effort went into developing that hub in that IPB had no university-wide internal computer network to build upon. The University of Rhode Island is launching a new web site (http://www.pesisir.or.id) very shortly that will become a rich source of information, reports and publications, largely in Bahasa Indonesia, concerning coastal resources management issues in Indonesia. They also plan to publish a coastal resources atlas, online.

Both programs stated that "pipes" are a major problem in maintaining their networks, especially on the outer islands where offices and partner institutions are located. They also felt that a second problem was limitations on web content that is relevant to Indonesia and in Bahasa Indonesia. The University of Rhode Island believes that there are many opportunities to increase Internet mastery in their field, with SEAMEO meetings, Asian Institute of Technology short courses, and other professional opportunities for Indonesians in the coastal resources management field.

Potentials: There seem to be many opportunities to use ICT technologies to strengthen decentralized natural resources management in Indonesia, building on the ICT foundation pioneered by both EPIC and CRM programs. Among the possibilities and challenges are:

Access. Many of the issues faced and solutions offered for USAID's decentralization program are similar to those faced with decentralizing natural resources management. Given the use of regional universities, examination of VSATs to improve Internet access may have merit.

Mastery. Regional universities may be able to play a role increasing awareness and providing introductory courses on how to use the Internet for local governments in their respective provinces. More professional training may be necessary in select areas which would probably have to be organized from Jakarta.

Content. The reports, email lists, and publications that were developed for NRM and CRM that are online appear to be a base to build upon to better educate local government officials now charged with greater natural resources management responsibilities. Many materials may need to be simplified for less technical program managers.

Improving the Health of Women and Children

Strategy: This strategic objective will result in family planning services of higher quality, increasingly acceptable to the population and consistently used. Women will be less likely to die in childbirth and infant mortality will be reduced. Severe micronutrient deficiencies among women and children will be reduced. Further transmission of HIV and other sexually transmitted infections will be reduced. Efforts to implement TB control programs will be expanded.

Key Results: Three intermediate results are: (a) Policy environment for reproductive and child health improved; (b) health service systems strengthened to improve access, quality and sustainability; and (c) women, families and communities empowered to take responsibility for improving health.

ICT Utilization: USAID's SO Team believes six USAID activities have used or have the potential to use ICT. These are the Family Health International, Helen Keller International, JHPIEGO/MNH, John Hopkins University/PCS-STARH, JHU/CCP-Health Indonesia 2010, and PATH programs. Two partners were surveyed: Family Health International and PATH. In general, USAID's SO Team believes that a major problem is that Indonesia is awash in health data and information but not much is disseminated. ICT can play a role in resolving this problem.

Family Health International is USAID's partner in the prevention of HIV-AIDS which focuses on increasing prevention behavior by high-risk groups and improving access to clinical services. FHI sees the value of ICT in HIV-AIDS control, but is just getting starting on the application of ICT. The project doesn't have a web site but is planning to have one that will be subsumed under the parent FHI web site. FHI believes lack of infrastructure as a major constraint to greater utilization of ICT in HIV-AIDS, particularly in remote areas. Language barriers are a second reason why the Internet is presently of limited use in public health in Indonesia. At the center, the Ministry of Health has an intranet but it is not connected to the Internet. Little information is published by the Ministry of Health on the web, but there are discussions underway to fix the infrastructure problems, and retrieve and publish HIV-AIDS information, in Bahasa Indonesia, on the Internet.

FHI sees major awareness problems within Indonesia's public health profession regarding the use of ICT. Donors use it extensively; download information and print it out for counterparts. Thus training will be a key element of the FHI program. Decentralization of public health in Indonesia

presents additional challenges. The costs of drugs and medical equipment will soar because of reduced purchasing powers of local government units. Information will become a scarcer commodity. Thus, an ICT strategy under the era of public health decentralization may be a worthy endeavor. A regular forum among PHN partners and GOI counterparts on how to utilize ICT in publish health could help raise awareness.

PATH is embarking on a child health nutrition project in West and East Java Provinces that will rely heavily on ICT. These provinces will work with 8-10 districts. At this time, provincial health offices have personal computers and Internet access. However, kabupaten do not and the PATH program will provide PCs and modems. Local governments and NGOs will then have Internet access and the ability to download child health nutrition information. These local partners will be able to download and print out fliers, presentations and technical information. There will be a public site with general information and health articles. A password-protected Intranet will be used for project specific information.

PATH sees ICT use in Indonesia in its nascent stage. Pipes are a major problem outside of Java and other major urban centers. Awareness on the possibilities of ICT and public health is very low. Workshops to increase awareness would be useful, and it would make sense to invite representatives of the ISP industry to participate. Public health content on the Internet is limited. English language is a barrier to Indonesian use of the Internet for public health today. More Indonesia-specific public health information in Bahasa Indonesia makes sense.

Potentials: Based on this limited survey, Indonesia has not utilized ICT in its public health programs to the extent of other developing countries. There is thus a lot of potential for the Internet to become an important and integral tool for improving health and for assisting USAID to achieve its ambitious strategic objective. However, for this to happen, USAID and its partners need to address the problems of access, mastery and web content discussed earlier.

Access. As discussed earlier, public health programs, especially in the decentralization era, will be challenged by ICT access in remote locations. Some of the suggestions made earlier with respect to addressing access for local government units may also pertain to USAID's health programs.

Mastery. ICT awareness seems to be a major issue in the public health profession in Indonesia. Given the wealth of experience among public health partners in other countries, there may be merit in holding periodic workshops in Jakarta and regional settings on how ICT can be a valuable tool for achieving public health objectives. The Internet for Novices training may be appropriate for local government officials. More in-depth training, such as The Internet for AIDS Professionals might be built into specialized USAID activities. Attention might be paid to more systematic training on the Internet for the Ministry of Health.

Content. The donor community in Indonesia might be asked to make a commitment to systematically build the Internet as a medium for disseminating public health information. Reports, publications, statistics relevant to Indonesia, and in Bahasa Indonesia, could be published on the web at relatively low cost and thereby have a greater and more enduring audience that simply storing paper reports on a shelf in a government office. And with decentralization of public health, information, implementing regulations, online procurement systems, and other web applications, such as distance learning, for local governments could have particular value today.

Reducing the Impact of Conflicts and Crises

Strategy: USAID will ensure that critical humanitarian needs are met in response to disasters and crises. USAID will also support rapid quick-impact interventions to alleviate existing and emerging conflicts, particularly in Aceh and Papua, as well as help develop local capacity to advance preventive policies and practices that will mitigate the impact of future conflicts.

Key Results: Three intermediate results are: (a) Improved welfare of populations affected by natural or man-made disasters; (b) food security for vulnerable populations improved; and (c) indigenous efforts and capacity to resolve conflict and promote reconciliation strengthened.

ICT Utilization: The Office of Transition Initiatives has hundreds of local partners. Some have email addresses but very few have web sites. The Office of Food for Peace likewise has many partners. Those that are associated with international voluntary organizations tend to have web sites and live and breathe over the net. However, many local NGOs lack both web sites and even email. There are a number of email lists pertaining to crises situations in Indonesia which get information and news out quickly. Unfortunately, sometimes there is irresponsible reporting on events, further inflaming religious or ethnic crises.

Websites for USAID's Offices of Transition Initiatives and Food for Peace

1.	Indonesian Institute of Sciences	www.lipi.go.id
2.	Komnas (Indonesian Commission on Human Rights)	www.komnas.go.id
3.	PACT	/iriprog@cbn.net.id
4.	Internews	www.internews.org
5.	Asia Foundation	www.asiafoundation.org
6.	International Center for Journalists	www.icfj.org
7.	Louisiana Public Health Institute	www.lphi.org
8.	Yayasan Lembaga Banutan Hukum Indonesia (Indonesian Legal Aid Society)	www.ylbhi.org
9.	Universitas Padjadjaran	www.unpad.ac.id
10.	Universitas Sumatera Utara	www.usu.ac.id
11.	International Federation of Red Cross and Red Crescent Societies	www.ifrc.org
12.	United Nations Office for the Coordination of Humanitarian Affairs	www.reliefweb.int/ocha_ol
13.	World Food Program	www.wfp.org
14.	Action Against Hunger	www.acr-fr.org
15.	Helen Keller International	www.hkworld.org
16.	International Medical Corps	www.imc-la.org
17.	Badan Meteorologi Dan Geofisika	www.bmg.go.id
18.	ASEAN Earthquake Information Center	http://aeic.bmg.go.id

Potentials: The Internet can play a greater role in alleviating and responding to crises in Indonesia. While there are a number of web sites and web applications (email lists, weather patterns) that are useful for networking and obtaining current information, the full potential of the Internet is not being met.

Access. This will remain a major constraint to the utility of the Internet as a tool to respond to crises in Indonesia. Yet as pointed out elsewhere, there are technological solutions that can be employed, at

increasingly lower costs. An examination might be made, for example, of PMI, the Indonesian Red Crescent Society, to understand the constraints their national network of offices faces with respect to communications, Donor support could then be provided to strengthen that organization's ability to access the web.

Mastery. Training programs, ranging from awareness, to introductory and professional training might be systematically offered to increase the ability of the relief community in Indonesia to utilize ICT in crisis situations. Workshops and seminars can increase general awareness. At the other end of the spectrum, interest in workshops on The Internet for Relief Workers could deepen professional capabilities.

Content. There is much material available in English on the Internet that can be useful to relief workers and managers. Some of this material should be translated into Indonesia so that it is more readily accessible in Indonesia. Thought might be given to creating a portal, one location where relief workers can go to that is easy to navigate and that provides practical and easily understandable advice on how to respond in emergency situations. This portal could be a major topic in some of the mastery training suggested above.

Sustaining and Deepening Democratic Reforms

Strategy: This strategic objective pertains to laws, policies and practices that support democratic government and political processes. The following democratic reforms are of particular interest: Establishing a democratic legal framework; increasing civilian authority over the military; making key government institutions at national and local levels more responsive, capable and accountable; increasing the impact that civil society has on national and local governance and politics; and initiating meaningful reform of the justice system to make it more honest, accountable and technically capable.

Key Results: Three key intermediate results are necessary to achieve this objective: 1) Key national and local level government institutions made more responsive and effective; 2) Increased citizen participation in governance; and 3) Capacity and support for justice sector reform increased.

ICT Utilization: The role that information and communications technologies can play in creating a sustainable civil society and democracy is understood in Indonesia. Bappenas, the national planning, recently developed a national Information Technology Framework for Indonesia, the vision for which was the development of a civil society based on information technology. During the past two years of political transition, the Internet has been used by activists to push for political reforms, highlight human rights abuses, and draw attention to regional, ethnic and religious conflicts. During the disturbances that led to the resignation of former President Suharto, one student activist who helped topple former President Sukarno observed that the Internet is a new strategic tool supporting the pro-democracy movement. A leading Indonesian newspaper had millions of “hits” during the tense days leading to the May 1998 resignation. Although the Internet is certainly in its nascent stage in Indonesia, it holds the promise of significantly strengthening democratic institutions; providing a link to the outside world and a unifying tool to forge greater internal collaboration in this vast archipelago. The stronger ICT becomes in Indonesia, the more difficult it is to reassert authoritarian

rule. This generalized relationship between modern information and communications technologies is understood in Indonesia.

But how well is ICT utilized in the day-to-day political transformation in Indonesia? Fourteen democracy, governance, civil society and other organizations were visited, based on suggestions from the Indonesia Civil Society Strengthening and Support (CSSP) Project to answer this question. The findings are that:

Some USAID supported activities have integrated information and communications technologies into their operations, contributing to more transparent governance, and stronger individual civil society organizations. Other groups have plans to harness ICT to achieve their civil society goals.

Many more partners have not yet integrated ICT within their programs to a significant degree. Limitations on pipes are part of the problem, but more limiting are the "soft" issues of access, mastery and content noted previously.

There is no strategic vision on how ICT can become a stronger pillar in support of democracy, governance and civil society. Each grantee is pursing individual ends but the civil society community doesn't have a common vision or approach for strengthening the utility of ICT in fundamental ways.

How individual organizations view and use the Internet

Yayasan PAKTA. This Foundation focuses on institutional development and capacity building of Indonesian NGOs and specializes in the application of ICT to carry out this mission. Details about their capacities and programs are found on their website (http://www.pakta.or.id). PAKTA has received grants from Australia, the United Nations and the World Bank's InfoDev Program. The yayasan maintains the Indonesian NGOs Electronic Network (http://www.lsm.or.id) that currently assists approximately 120 smaller NGOs (involved in AIDS, children, environment and capacity building) with web space, technical support and IT training. PAKTA has supported regional NGOs in Nusa Tengara Barat, Nusa Tengara Timor, Jakarta , and in other provinces. PAKTA has helped develop databases for the Indonesian Planned Parenthood Foundation. PAKTA is considered one of the most ICT-proficient NGOs in Indonesia and is about to conduct a survey for USAID's CSSP project, examining the hardware/software, human resource, management, and sustainability needs of CSSP grantees throughout Indonesia. PAKTA, interestingly, serves as the NGO representative to Telematics Coordinating Team, but has not been consulted much in this inter-ministerial forum to promote ICT in Indonesia.

LP3ES, the Institute for Economic and Social Research, Education and Information, is a thirty-year old organization, engaged in education and training, institution building, human rights, community development, research, publications and public information and advocacy. LP3ES has received support from USAID and donors for years, most recently from CSSP and OTI. LP3ES developed a website (http://www.LP3ES.or.id) this past October based on a grant from OTI. The institute uses the site to post information on smaller NGOs in a searchable database. The organization markets new publications on the website also. LP3ES plans to introduce a calendar of events. In one interesting experience, LP3ES collaborated with an American voluntary agency to carry out a minimum wage pricing survey in Indonesia based on a particular methodology developed by the American partner. This entire relationship was virtual, with LP3ES developing the relationship,

learning the survey methodology and reporting findings back solely over the Internet. At the same time, LP3ES does not use the Internet to carry out economic or social science research.

PACT. This US voluntary organization received a grant from OTI to establish JaringNet, as a pilot activity to support the information needs of NGOs and citizens as they seek to move their society towards democracy. The concept was to promote community, face-to-face, consultations. The Internet was viewed as a means to distribute "best practices" based on the face-to-face discussions through the JaringNet website and electronic mailing lists (http://www.jaringnet.org). A newsletter and radio were also used to disseminate information. The website was up since October 1998 and was used as intended. While considered successful, JaringNet no longer sponsors these community dialogues due to the termination of donor funds. Thus the website is not updated. PACT has plans to build on the experiences of JaringNet to work on more grass-roots civil society issues and foresees a role for the Internet in this process.

YLBHI is the Indonesian Legal Aid Society (http://www.ylbhi.org or http://www.ylbhi.or.id) with 14 branches throughout Indonesia. The Society was an early adopter of ICT technologies in Indonesia; a member of NusaNet, an initiative supported by USAID to serve as an NGO Internet Service Provider that was not sustainable and closed last year. The Society is presently developing a human rights database that will be made public over the web in about three months time. The 14 branches provide input to the database, which is maintained in Jakarta. One of YLBHI's biggest constraints is the poor Internet access for several of their branches. Two branches need to dial into Jakarta to access the web. YLBHI also believes that the Internet is weak in human rights content (pertinent to Indonesia and in Bahasa Indonesia) and that Indonesia is short on the human resources required to develop web applications, NGOs being unable to compete with the private sector for such talent.

DPR-RI. The Indonesian House of Representatives has a website (http://www.dpr.go.id) and has received assistance from IFES to broadcast live parliamentary sessions through cable television to the public, through SuaraNet, that is similar to C-SPAN in the United States. The DPR is not well endowed with computers, networks or internet access; and lacks the human resources to operate and maintain such IT systems. The DPR supports a proposal by IFES (see below) to address this problem.

MPR-RI. The People's Consultative Assembly also has a website (http://www.mpr.go.id),and has received assistance from IFES, which is also attempting to help upgrade the Assembly's ICT needs. As with the DPR, the MPR's existing IT capabilities are in decline, because of inadequate investment in applications, training and equipment. The IFES proposal recommends new custom applications and improved collaboration as well as a broad-based web presence to improve political transparency and access to voters. Inputs required include personal computers, a high speed Local Area Network, an expanded central Server facility, improved access to the Internet and an ongoing training program for users.

IFES. The International Foundation for Election Systems has been very forward looking in terms of incorporating ICT into their programs. For the 1999 national elections, IFES developed a website (http://www.kpu.go.id) for the national election commission and posted election results as they came in. Information flowed out of a joint elections media operations center. IFES now assists the DPR and MPR through its support for the C-SPAN-like cable television broadcasting of live parliamentary sessions. They also maintain a web site (http://www.swara.net) that keeps track of parliamentary

legislation and hearings for the past year. IFES has plans to continually upgrade the web site to add interactivity with viewers. As noted above, IFES is actively seeking outside assistance to improve the ICT capabilities of Indonesia's legislative branch of government. IFES is also developing a proposal to provide internet access at academic institutions utilizing PC-direct technologies, in an attempt to boost the low internet penetration rate in Indonesia and reach the next generation with information concerning democracy. IFES would also like to get more engaged in civic education, perhaps through the elections commission web site (that has been dormant since the last election), in preparation for the next round of national elections, presently scheduled for 2004.

CETRO. The Centre for Electoral Reform is coordinator of a coalition of 12 NGOs, all supporting direct presidential elections for 2004 (if not sooner). CETRO uses an email list to communicate but only half of the coalition members (all Jakarta-based) has an email address. CETRO itself uses the Internet extensively to carry out research to help them advocate for direct presidential elections. CETRO finds the Internet more useful to obtain information from the outside world, than to communicate through networks in Indonesia. Further, there is little information pertinent to electoral reform generated in Indonesia. They have a web page but it is not available to the public yet.

NDI. The National Democratic Institute works in 40 countries, assists with political party strengthening, and has a worldwide online resource center, "Access Democracy". They have been in Indonesia since 1998 and work on civilian-military relations, constitution and elections, reform and decentralization. Thus far, Internet use has been internal to the organization. NDI thought Indonesian CSOs weren't ready before to use the Internet effectively. However, they believe the time is right now and plan to develop a resource center for civil society, an online information resource center with news, reports, analysis, discussions, online polling, and other web applications. Their online resource will be available to partners, in Jakarta and the regions.

PSHK. The Center for Indonesian Law and Policy Studies publishes "hukum online", a free legal database at http://www.hukumonline.com. High bandwidth costs are a major constraint for SMEs, like PSHK. One-fifth of their expenses are telecommunications costs. PSHK is providing advice on e-government to the GOI. PSHK believes that e-government in Indonesia is just getting started, but there are some interesting examples of what can be done. One example is an online ombudsman at http://www.ombudsman.go.id where citizens can file complaints and are given a code to monitor actions taken. Another is the Department of Justice and Human Rights initiative for online limited liability registrations. With respect to "hukum online" PSHK received approximately 10,000 hits since opening the site. Their parliamentary watch website is particularly popular.

UN PEG. The Chair of the Policy Committee and Senior Advisor to the United Nations Partnership for Government Reform in Indonesia, Dr. Andi Mallarangeng, believes that the Internet can play a very useful role in decentralization. However, he believes local governments should be approached via NGOs and the for-profit business community, not the central government.

The ***US Embassy Public Affairs Office*** supports civil society ICT activities in Indonesia. Under its auspices, the Global Technology Corps provided volunteers in August and October 2000 to lead internet advocacy workshops. The first workshop targeted women's organizations. The second workshop engaged religious, environmental, human rights, political and economic NGOs. Keen interest was expressed in additional training. Last year, the Fulbright Foundation organized a workshop on distance learning (one issue raised by the Indonesian participants concerned

accreditation.). A new ICT initiative is planned in which Civitas International's Center for Civic Education will publish civic education materials in Indonesian for an Indonesian audience, along with more traditional workshops.

WALHI. The Indonesian Forum for Environment (http://www.walhi.or.id) is itself a network organization with 450 members and uses the Internet extensively to communicate and support its members. The WALHI network is reorganized into 24 provincial network organizations with links down to kabupaten and villages. The central WALHI office provides ICT advice and services to the new provincial nodes, some of which are developing their own websites. They recognize that various media will be needed to disseminate information below the provincial level.

ISAI. The Institute for the Studies on Free Flow of Information is very much engaged in ICT work. The institute sponsors courses for journalists that include some Internet training. ISAI has its own website (http://www.isai.or.id). The institute uses satellite technologies and distributes their 68H radio program via the web to 150 local stations. ISAI is now experimenting with packet radio, which is believed to have a lot of potential in Indonesia.

Potentials: The May-June 1999 edition of Civicus World[30] was devoted to describing how civil society organizations use new information technologies as a strategic tool for social change. The newsletter concluded that "civil society organizations around the world are becoming major users of the new information technology as a strategic tool for advocacy, public mobilization, training, management, collaboration, and even for fundraising." Numerous examples of creative and effective uses of the Internet by CSOs were provided. In a forward-looking compendium of articles entitled "Civil Society at the Millenium"[31], one essay explored the long-ranged potentials for ICT as tools to support civil society. In CyberCitizen[32], hundreds of applications of the Internet to strengthen advocacy in the United States are provided. While impossible to quantifiably compare where Indonesia stands with respect to others regarding use of ICT for democracy and civil society strengthening, it is reasonable to conclude that Indonesia is at the low end.

To begin to realize this potential, Indonesia will need to address the same three elements described earlier: Increased internet access and greater mastery of ICT skills by partners and citizens, and more web content and applications supporting civil society.

The Assessment Team recommends approaching this in a systematic way, beginning with a detailed survey on ICT and civil society in Indonesia.[33] We suggest that this survey examine ICT use by civil society from two dimensions:

An inventory of the degree to which civil society organizations have Internet access, mastery and relevant content. The survey would take a representative sample of CSOs by size, location, subject matter interest and perhaps additional factors. Findings would provide a baseline by which future

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[30] The newsletter of Civicus: World Alliance for Citizen Participation.

[31] Published in 1999 by Kumarian Press, in collaboration with Civicus.

[32] Christopher Kush, published by St. Martin's Press, September 2000.

[33] The PAKTA survey for CSSP referred to earlier is limited to a grant-by-grant series of findings and recommendations and therefore won't be able to address more strategic issues. For example, the PAKTA survey does not examine the extent of web content in Indonesia that is relevant to democracy, governance and civil society groups.

improvements could be measured. For example, the universe of information and applications on the Internet that support various civil society issues can be measured. The extent to which CSOs have access can also be measured.

A comparison of how the Internet is used by Indonesian CSOs with international best practices would be conducted. Seven features could be compared: Research, public transparency, public advocacy, professional networking, institutional networking, distance mentoring and distance learning. These Internet applications describe essential uses of the Internet, and were identified in a study for USAID/Washington on how the internet can be effectively employed to improve economic policies. These Internet applications appear relevant for civil society organizations also.

The findings of the survey would be reviewed and commented on by a multi-donor, multi-partner workshop to obtain outside views on the findings. The workshop participants, based on a review of the facts, would be asked to help identify interventions that would strengthen ICT as a strategic tool for civil society in Indonesia. Internet service provider companies and other ICT service providers would be invited to obtain industry perspectives. Examples of such interventions could be:

Access: Public-private partnerships with ISPs might help address access problems facing CSOs in particular locations. Vouchers might be provided to reduce the costs for Internet access for smaller CSOs for a period of time to demonstrate the value of utilizing the Internet.

Mastery: A voucher program that would provide CSOs throughout Indonesia (not limited to "grantees") with opportunities to avail themselves of ICT training at basic awareness, novice and professional mastery levels. Vouchers could be redeemable from pre-certified training providers. Guidelines for courses would be provided by CSSP. Work order or matching grants could be provided to training providers to improve their skills on a particular subject, say, The Internet for Human Rights Activists.

Content: Work orders could be provided to organizations to start building up the Indonesian Internet (Indonesian specific information in Bahasa Indonesia) in areas considered critical based on the inventory and examination of best practices.

The outcome of this approach could be a quantum increase in the utility of the Internet to strengthen civil society in Indonesia from a national perspective.

Another approach for USAID to consider would be to carry out pilot projects in the USAID geographic regions that link satellite-based technologies with cross-sector groups to create flexible information, civil societies. The term "rural civil society" is coined here, simply as shorthand for communities that are off the telecommunications grid and therefore limited in their ability to access the global information highway. As mentioned elsewhere in this report, there are low-cost, satellite solutions, coupled with wireless LANs a WANs that can flexibly inter-connect local government, CSOs, small traders, hospitals, environmental organizations and other organizations in a delimited geographical area. Again, a public-private partnership whereby a private ISP would service this community might be explored. USAID could assist with promotion, awareness training, and web content to convince these local community organizations of the benefits of going online. Vouchers could underwrite start-up costs for the users.

6. General Recommendations

The ICT Assessment developed two sets of recommendations, one set of general recommendations for consideration by the GOI, donors, multilateral development banks, as well as the private sector, and a second set of recommendations aimed specifically for consideration by the USAID/Jakarta Mission. The following are the General Recommendations.

These recommendations have been developed based on (1) reviews of earlier studies that have a direct relationship with ICTs, (2) discussions and interviews with personnel in the public and private sectors, and (3) discussions with personnel in the USAID/Jakarta Mission. They consist of recommendations considered to have the highest value for key areas—policy, pipes, private sector, people—during the timeframe of the assessment. Where possible, they include a background rationale and a target result or results.

1. Awareness and educational campaign for Government of Indonesia officials and legislators

With the growing importance of ICTs, specifically telecommunications, those setting policy direction must be well informed. This includes technical support staff directly working on details, managers with key responsibilities, and those shaping, reviewing, and voting on legislative agendas.

The awareness component of this recommendation can be carried out through half-day and one-day seminars at a local university. Ideally, a year-long agenda of topics that build on each other and address issues confronting the ICT situation in Indonesia could be constructed and pursued with cooperation of other donors, the private sector, USG (e.g., FCC, NTIA/DOC, and others), as well as participants from the U.S. private sector. It is recommended that these formal half and one-day sessions be augmented by informal meetings and discussions with Government of Indonesia representatives and legislators (e.g., Presidential Aides, Lower House (DPR), and MOC officials) to discuss how to accommodate and leverage topics and the newer emerging technologies and solutions. While the public sector is the primary target of "policy" awareness, the private sector should also be included.

In addition to "awareness" seminars, substantive training of one to two weeks that focuses on details, such as interconnection, tariff-setting, cost-based pricing, etc., is needed.

The core of this activity should be in-country, and aimed at supporting more participants than can be engaged effectively under these mechanisms alone, but it should also be supported through continued and even enhanced use of USTTI's services as well as periodic educational tours to the United States for selected individuals.

2. An Independent Telecommunications Regulator Body

There is the ultimate need for the GOI to establish a strategy whereby there is support in Indonesia for establishing an open and predictable telecommunications marketplace that has private sector engagement that expands the access throughout Indonesia. This can best be done by

establishing an independent regulatory body that is subject to minimal political influence and has a strong knowledge/skill base by which to carry out its responsibilities. It was unclear during the ICT assessment that such an effort has broad support, but it is important enough, and there appears to be growing sentiment for it particularly from the private sector. Technical Assistance could be provided by any number of donor and/or multilateral banking institutions.

To accomplish this will require an integrated set of actions to (1) establish awareness and education at managerial/ministerial levels as well as the legislatures (e.g., it should be one of the early topics reflected in recommendation 1); (2) gain support of the private sector, specifically U.S. high-tech and telecommunications players and marshal this support at key government and legislative officials; and (3) develop implementing alternatives and operational guidelines on how such an entity would work, what legislative changes (if any) are needed, safeguards, and even an initial agenda. This is best accomplished through a 6-9 month technical assistance contract carried out as part of, or in conjunction with, recommendation 2.

3. Establish and Empower a new national-level ICT Steering/Coordinating Entity

With the promise that ICT holds in so many areas for Indonesia, and taking into account the need for focus, coordination, and collaboration of a wide range of ICT-related activities, there is the need to establish a high-level steering/coordinating entity. This Entity would include high-level representatives of key ministries, private sector organizations, universities, and non-governmental civil society organizations. This body could align GOI, business strategy, civil society and will create powerful linkages and will broaden inclusion of all stakeholders in the creation and implementation of an ICT strategy for development. Similar such entities have been put into place to manage national ICT priorities, a recently formed "High Tech Council" in Armenia being one of the more recent examples.

There are several alternatives for setting up such an entity, including the following: Establish a legal context for a new TKTI that answers directly to the President; its structure should consist of evenly of representatives of relevant government agencies and the private sector; with much like a telecom independent regulatory body;

a) Establish a new Coordinating Ministry for ICT with the similar powers and function as the CM for Economic Affairs but the CM for ICT would have to work with the above TKTI which act as a formal advisory body and is chaired by the CM for ICT; or

b) Create a new position of Assistant to the Coordinating Minister for Economic Affairs but with an exclusive responsibility for ICT;

4. Frequency spectrum management

With the increasing use of wireless technologies—whether fixed, mobile, telephony, satellite, or wireless Internet—it is imperative that radio frequencies be adequately managed. This entails establishing local allocations, licensing, monitoring, and, as needed, relocating and settling interference issues. This is especially acute in urban areas where the growth of mobile wireless is the greatest and 3G-related frequencies are likely to open up in the near term.

For the short term this will most likely be accomplished through a detailed assessment of the MOC's current capabilities and plans and those of other ministries with an interest (e.g. broadcast, police, military, and others). From this base, a feasibility study would explore options for pursuing the establishment of such a function (typically including the establishment of a Spectrum Management Authority - SMA). Such a study would need to examine issues that could be raised by the nation's decentralization activities and how they could affect spectrum management (including licensing) across Indonesia.

Here again, the awareness and educational activities of recommendation 1 would help create a receptive audience in the Government and Legislature. This could become especially important if national or regional issues need to be addressed, and if the SMA becomes engaged in revenue capturing as part of their frequency management activities (which is very common).

5. Formulation of national policy on e-commerce

For e-commerce to become a reality in Indonesia, the Government of Indonesia should lead the formulation of a national policy or an action plan for the deployment of e-commerce. The vehicle for delivery of national policy can be the secretariat of the Telematics Coordinating Team (TKTI) or the Cabinet Secretariat, or any other appropriate entity. The national policy should direct one ministry to take responsibility for preparing an enabling legal and regulatory framework for e-commerce. This does not mean that one ministry should have sole responsibility. In fact, each relevant ministry should be involved. For example, the Ministry of Justice, the Ministry of Finance, the Ministry of Industry and Trade, the Ministry of Post & Telecommunications, the Ministry of Tourism, Arts and Culture, and the Ministry of Communications and Transport should all be involved. But there must be a coordinated approach for moving forward. A national policy or an action plan that provides clear guidelines and responsibilities should come from the highest level, even the President's office.

Technical assistance should be provided through technical advisers and training to facilitate the formulation of national policy and the selection of an appropriate vehicle for its delivery and implementation.

While public sector officials are the primary topic of this recommended technical assistance, it is also appropriate and necessary to include private sector firms in a broader educational component. This may well be done in conjunction with U.S. private sector firms such as IBM, Oracle, CISCO, Microsoft, etc.

6. Establishment of subcommittee on e-commerce law reform

Indonesia does not have a coordinating entity for e-commerce law and policy. Any activity relating to legal reform in Indonesia would greatly benefit from a subcommittee on e-commerce law reform that could be housed in the Telematics Coordinating Team (TKTI), or a well-established business association (Mastel or Telematics compartment of Kadin) rather than competing ministries such as MOC, MOIT or MOJHR, or competing universities or "think tanks" in Indonesia. The committee should consist of private and public sector legal and technical experts, with a mandate to monitor e-commerce issues relating to soft infrastructure. Specifically, this committee should work with the Government of Indonesia to create a business and legal environment conducive to e-commerce, and play an important role in issues involving certification authority, encryption and security policy and

Internet domain name systems. The committee should collaborate with international partners to identify common cross-border issues to support and protect e-commerce in Indonesia and abroad.

Technical assistance should build the committee's technical expertise and capability so that it can do feasibility studies and analyses of complex legal and regulatory issues that arise in the context of e-commerce. This can be achieved by providing for short- and long-term technical advisers to work with the committee and the Government. Training workshops on e-commerce should also be organized in-country and overseas.

7. Law reform and legislative drafting

There is the need for technical assistance to the GOI to support legislative and regulatory reforms that remove barriers to e-commerce in Indonesia. This can be achieved by providing short- and long-term technical advisers (both local and international) to help the Government of Indonesia identify legal and regulatory issues critical to e-commerce, prepare feasibility studies, and formulate appropriate responses at the national and international level through legislative drafting. Training workshops and overseas study trips should be organized for policymakers and government regulators. It could be especially beneficial to create university linkages between Indonesia and the United States that facilitate the continual exchange of information and expertise. The reform activity should focus on the following legal issues:

- Legal validity of electronic information and data messages
- Electronic signatures
- Encryption and security
- Technology/computer related crimes
- Intellectual property rights
- Privacy
- Consumer protection
- Taxation and customs

Identifying only these areas for legal reform assumes that the existing commercial law framework is conducive to business investment.

8. Strengthen law enforcement

While engaging in legislative reform, Indonesia must implement and enforce the new laws and ensure a safe and secure business environment. Only then will legal reform be meaningful. Technical assistance should be provided to train and build the capability of law enforcement agencies to deal with the legal and technical complexities of technology-related crimes. Technical support should also be provided to enable local law enforcement to establish links with foreign counterparts to reinforce police and judicial cooperation to prevent and combat illegal content and Internet-related crimes. This can be achieved through targeted training of law enforcement officials, both in-country and overseas.

9. ICT law and policy awareness.

Legal reform can be successful only if involved parties are educated and equipped to deal with it. Upon passage of enabling e-commerce legislation, the judiciary, government regulators, policymakers, and law practitioners must have training that builds expertise and capability so that laws are implemented and enforced. In view of the legal complexities and Indonesia's relative inexperience in the ICT sector, training programs in substantive areas of law, policymaking, and enforcement procedures should be the focus of technical assistance in this activity.

Technical assistance should be designed to make use of experienced consultants who have hands-on experience with targeted training workshops in-country and overseas. Supporting study trips to other countries should be an integral party of the assistance.

10. E-government

The Government of Indonesia should take the lead in adopting and promoting ICT in Indonesia by computerizing and automating business and administrative functions where appropriate. A government leading by example sends an important signal that ICT is secure and therefore safe for the private sector. More importantly, e-government leads to a more efficiently run government. This applies especially to procurement, service provision, revenue collection, and other administrative functions such as company registration and motor vehicle registration. Recognizing the benefits of e-government, the United States recently enacted the Government Paperwork Elimination Act to remove barriers to the electronic interaction of citizens with the federal government.

Indonesia has no e-government. Reportedly, the Ministry of Industry and Trade is considering a proposal to computerize company registration. The government should develop online information services and a system for online intra-government interaction. Where feasible, technical assistance should be extended to promote pilot projects in such undertakings.

11. Development of electronic database of laws, regulations, and decisions

Access to information can be key to legal reform, transparency, investor confidence, and the attraction of foreign investment. At present, public access to Indonesian laws and regulations is limited. Reportedly, the Government Printing Office (Percetakan Negara RI) does not have a budget adequate for the publication and dissemination of laws and regulations. The few public documentation centers that exist are not reliable. The Legal Information and Documentation System—developed by the National Legal Planning Agency (BPHN) at the Ministry of Justice and Human Rights in the 1970s (SJDI Hukum)—does catalog and index government regulations and provides limited services, but it does not address the fundamental problems of ineffective distribution, lack of timeliness, and legal uncertainty. Some private legal information web sites purport to provide full texts of Indonesian laws, regulations, and important case law in Bahasa and English. These sites include www.hukumonline.com, www.hukum2000.com and www.indohukum.com. To enable reliable and easy access to Indonesian laws and regulations, responsive web-based legal information systems that enable public access to such resources should be developed and promoted.

Because Indonesia's courts have not traditionally attached much significance to precedent, there have not been many efforts to create a database of decisions reported by courts and regulatory

agencies. The lack of access to case law deprives the public and the legal system of much needed understanding of the implementation and enforcement of laws and regulations. A comprehensive digest of reported court decisions and regulatory agency decisions would build Indonesian jurisprudence and help domestic and foreign businesses, consumers, and the legal community keep up with legislative developments in e-commerce in Indonesia.

In addition, a database of draft laws and pending bills and regulations that would enable public access and feedback should be created for wide electronic circulation and distribution. This will increase public involvement in the formulation of law and policy in areas that affect the public's interest. The private sector or an appropriate government agency with private sector participation should develop or provide free access to such a database.

12. Strengthen private industry associations and government coordination mechanisms

Resolution of controversial regulatory issues and decisions is urgently needed. Several business associations have formed in Indonesia's expanding high-tech sector. These are typically organizations of technical individuals, many with limited organizational experience upon which to build a collegiate organization that strengthens the sector and provides advocacy. External support to strengthen existing credible private sector organizations can result in effective lobby groups with strong legal standing and good governance. These organizations are then able to collect fees, establish services, create an agenda for expanding their sectors, and carry out advocacy activities to the Government of Japan and the Legislature. Such organizations include the Indonesia Infocomm Society (Mastel), the Telematics Compartment of Kadin and National Telematics Movement (Genetika), a local chapter of the Internet Society (ISOC), Forum for Indonesia's Internet Industry (FI3).

One possible form of support that could be of value here would be to establish a web site on U.S.-Indonesia ICT cooperation, through which a deeper understanding of issues while forging a closer relationship with industry associations for the purposes of future assistance to organizations, such as the Indonesian Internet Service Provider Association (APJII), Indonesia Warnet Association (AWARI), Indonesian Software Association (ASPILUKI), Indonesian Integrators, Applications and Content Providers Association (APPKAI), Computer Traders Association of Indonesia (APKOMINDO), Warnet Hardware Suppliers Association of Indonesia (APPWI), National Telecommunication Companies Association of Indonesia (APNI) and others in the Telematics compartment of Kadin. A more detailed assessment of these organizations may be needed.

13. Facilitate trade

Promote Indonesian software products and business partnerships via supporting trade missions to and from the United States, Asia, Europe, and Middle Eastern and neighboring countries. These activities should be instrumental in marketing and building strategic partnerships for business expansion of the Indonesian software sector, which already shows promise (in Jakarta, Bali, Bandung, Bogor, Toba and other regional centers). Arrange logistics for visiting businesses travelling to Indonesia to explore local markets and firms.

A key focus here needs to be on attracting Foreign Direct Investment (FDI) to Indonesia specifically to strengthen and expand the ICT sector. This will take engagement from both the public

and private sector (see above recommendation re: coordination) as there's the need for the enabling conditions by the GOI, and the strengthening and promotion of the private sector to enrich the investment opportunities.

14. Expand overseas markets via B2C e-commerce

Support an Internet-based marketing plan to widen the overseas market for the products and services of particular Indonesian sectors. This would require first identifying sector representative or aggregating entities for target sectors. Assistance could be incremental, starting with support for developing a business plan, then for implementing the plan once it is accepted.

Some of Indonesia's sectors, such as tourism and handicrafts, lend themselves to expansion to global markets. What is needed is an aggregated effort to "brand" Indonesia through various media, including establishing and enriching an Indonesian Internet portal. To use the Internet and e-commerce to extend market reach for Indonesian products to the United States and Europe entails developing an aggregated Web site supported by catalogs of product information, transaction capabilities (e.g., acceptance of credit cards), and transaction status reporting, etc. The site could be developed locally, but would likely require hosting in the target country. Distribution, storage, shipping, and marketing capabilities would also need to be established in the target markets.

15. Promotion of local purchases by overseas customers via B2C e-commerce

Work with local firms to gain and put in place agreements to support a local entity to develop, host, and operate an e-commerce Web site for the B2C market. Assistance could be incremental, starting with support for developing a business plan then for implementing the plan once it is accepted.

This recommendation is based on the second model having some success in developing countries (e.g., Ethiopia, Sri Lanka). A number of local firms put up a consolidated e-commerce Web site (CyberMall) with a wide range of products for purchase by the country's Diaspora in the United States and elsewhere. These products and services are for delivery in the country to family members who still live in the country. Actual hosting many need to be in the countries of the target markets to ensure the required legal infrastructure to facilitate e-commerce—with back-office support through more conventional means until local laws and regulations support e-commerce.

16. Facilitate industry B2B e-commerce

Further analyze the potential for expanding exports through B2B e-commerce. This would include cross-walking the current industries operating in Indonesia with emerging e-commerce mechanisms in large consuming countries and developing strategies and business plans to link the two.

This recommendation is based on the third potential area for Indonesian businesses—expanding exports by leveraging industry-specific B2B vertical industry portals or "vortals." Here the goal is to expand market share through e-commerce links where there are already sector business relationships. This will most logically be in the area of minerals, chemicals, pharmaceuticals, and other processed natural products, but may also include textiles, footwear and electronics.

Technical Report

Indonesia—Information and Communications Technologies (ICT) Assessment

Appendices A - I

January 16–February 5, 2001

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Appendix A–G-8 Okinawa Summit Summary

In July 2000, the leaders of the world's most powerful nations met at the G-8 Summit in Okinawa, Japan to address the “global digital divide.” The result was the development of the Okinawa Charter on Global Information Society, and the launching of Digital Opportunity Task Force (DOT Force).[1] The DOT Force will mobilize resources and coordinate the efforts of governments, the private sector, foundations, multilaterals, and international institutions and others to bridge the international digital divide and create digital opportunities.

The Okinawa Charter and the DOT Force were undertaken in recognition that the developing countries are not participating fully in the information revolution. For example,

- Of the estimated 332 million people online as of March 2000, less than 1 percent (2.77 million) live in Africa (Nua Internet Survey, March 2000);
- Less than 5 percent of the computers connected to the Internet are in developing countries; and
- The developed world has 49.5 phone lines per 100 people, compared to 1.4 phones in low-income countries (International Telecommunications Union, 1999).

The goal is for companies, foundations, and non-government organizations to help create digital opportunities for the people of developing nations by taking concrete steps in five strategic areas:

- ***Fostering policy, regulatory, and network readiness***—Help developing countries adopt practices and regulatory frameworks that will encourage private sector investment but also reap the full economic, social, and cultural benefits of the diffusion of the Internet, e-commerce, and other information and communications technologies.
- ***Expanding basic connectivity to people everywhere***—Support the expansion of community access points or other forms of shared connectivity so that the Internet and telecommunications services are within walking distance of everyone. Invest in research and development that will lead to products and services tailored to developing countries and poor communities everywhere, such as low-cost, low-power, wireless devices.
- ***Building human capacity in education and training***—Increase significantly the number of people in developing nations with the technology skills and know-how needed to build, manage, and effectively use the information infrastructure of the 21st century. Help more people in developing nations become "technologically literate" through educational technology in schools, universities, communities, and the workplace.

[1] http://www.ecommerce.gov/ecomnews/pr0725001.html.

- ***Enhance healthcare and quality of life using information technology***—Promote applications of the Internet and information technology—such as e-health, distance learning, natural resource management, and preservation of cultural heritage—that have particular relevance to improving the quality of life in the developing world.
- ***Create new opportunities for small and medium-sized enterprises through e-commerce and e-business—***Encourage the development of micro-enterprises and small businesses that harness the power of new information and communication technologies. In all societies, develop venture financing sources that can drive innovation.

President Clinton, in partnership with corporate and non-profit leaders, announced several steps to bring digital opportunities to developing countries.[2] This included expanding the number of countries participating in the Internet for Economic Development (IED) Initiative. (Indonesia was recently added to the list of countries participating in the IED Initiative.) President Clinton also announced several new ICT-related initiatives involving the Ex-Im Bank, the Overseas Private Investment Corporation (OPIC), as well as several public-private, multilateral, and foundation-sponsored activities aimed at narrowing the digital divide gap.

This ICT assessment, which recognizes the same dynamics reflected in the G-8 Summit's "Call to Action, " proposes an integrated set of activities that could bring about significant and fundamental changes in the Indonesian economy.

[2] http://www.ecommerce.gov/ecomnews/pr0725002.html.

Appendix B–Digital Economy 2000

On June 5, 2000, the U.S. Department of Commerce issued the third annual report on the information technology revolution and its impact on the U.S. economy—*Digital Economy 2000*.[1] This series of annual reports has helped provide a comprehensive understanding of the direct and indirect impact of the ICT sector in the United States. In introducing the report, then Vice President Gore presented the following highlights from the report:

- IT accounts for half or more of the improvements in productivity since 1995—with 2.8 percent productivity growth from 1995 to 1999, which is double the 1.4 percent rate of 1973 to 1995. The U.S. has a new economy. Improved productivity has lowered inflation and raised real wages.
- IT is lowering inflation. Falling IT prices have directly lowered average inflation by 0.5 percentage points a year. By raising productivity, IT is lowering inflation of other industries.
- The IT sector is rapidly creating jobs at high wages. IT jobs average $58,000 a year, 85 percent higher than the average for the private sector. Between 1994 and 1998, employment in IT industries expanded by 30 percent, from 4.0 million to 5.2 million jobs. IT occupations that pay the best and require the most education have been growing most rapidly.

William M. Daly, then Secretary of Commerce, writes in the report's preface:[2]

> What we can see clearly are expanding opportunities. To meet these opportunities, we will have to ensure a stable and conducing economic and legal environment for continuing innovation in information technology and e-commerce. We need to encourage the building of a broadband infrastructure that allows all Americans to have access to the advanced services that support the Internet, and take the steps necessary with respect to privacy, consumer protection, security, reliability, and intellectual property rights that will inspire confidence in the Internet. To realize the full potential of this digital economy, every person and every business must be able to participate fully and make their own unique contribution to its development.

The report’s executive summary provides a strong message about the impact on ICTs in the U.S. economy. For example,

- The Internet in particular is helping level the playing field among large and small firms in business-to-business e-commerce;

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[1] http://www.ecommerce.gov/ecomnews/pr060500.html.

[2] http://www.doc.gov.

- Firms are moving their supply networks and sales channels online and participating in the new online marketplaces;
- IT advances and the spread of the Internet are also providing significant benefits to individuals;
- The vitality of the digital economy is grounded in the IT-producing industries—the firms that supply the goods and services that support IT-enabled business processes, the Internet, and e-commerce;
- Although IT industries still account for a relatively small share of the economy's total output—-an estimated 8.3 percent in 2000—they contributed nearly a third of real U.S. economic growth between 1995 and 1999;
- IT industries have also been a major source of new R&D investments;
- New investments in IT are helping to generate higher rates of U.S. labor productivity growth;
- Growth in the IT workforce accelerated in the mid-1990s, with the most rapid increases in industries and job categories associated with the development and use of IT applications;
- Analysis of the computer and communications industries in particular suggest that the pace of technological innovation and rapidly falling prices should continue well into the future; and
- Businesses outside the IT sector almost daily announce IT-based organizational and operating changes that reflect solid confidence in the benefit of further substantial investments in IT goods and services.

These developments reflect the dynamics of the U.S. economy relative to the ICT sector and its broader impact on the economy, but they also show the potential value of ICTs in other economies, including developing and transitioning economies. Clearly, the potential leveraging capabilities of ICTs in Indonesia are considerable with regards to assisting USAID/Indonesia in meeting its objectives and in bringing fundamental benefits to the Indonesian economy and its people.

Appendix C–Summary of ANE Bureau's ICT Program

DEVELOPING THE INTERNET ACROSS ASIA AND THE NEAR EAST—THE USAID GLOBAL INFORMATION INFRASTRUCTURE PROJECT

Purpose—Information and Communication Technologies (ICTs) are powerful tools for stimulating economic growth and social change. The quality of information and access to it are critical to the successful application and adoption of ICTs by society. ICTs cut across all traditional USAID sectors—health, community development, governance, economic growth and education. They enable groups working on common issues to benefit from each other's experiences and share best practices. They can

- Provide access to improved education and health in remote or inaccessible areas through distance learning, telemedicine, and interactive training;
- Improve services to citizens by providing online access to public services, enabling individuals and communities to make informed choices in the decision making process; and
- Reduce business costs while opening access to new markets through electronic commerce.

Program Description—Across Asia and the Near East, the Internet and e-commerce are emerging, but there are impediments to making them a part of every day business. Because the U.S. Government recognizes the critical need for partner countries to be engaged in Internet and e-commerce development, the ANE Bureau has adopted the four "P" approach to successful Internet development—Policy, Pipes, Private Sector, and People.

- ***Policy***—Policy reform to permit the introduction and growth of information and communication technologies, reduce barriers to open connectivity, and ensure that global electronic commerce can take place openly.
- ***Pipes***—Demonstrating the effectiveness of appropriate hardware and software by using the latest in technology, such as wireless, high-speed data transfer, secure transaction capability, extending the Internet to underserved areas, and working with private sector Internet Service Providers to offer services to clients.
- ***Private Sector***—Ensuring the private sector "can do what it needs to do to be successful." This entails combining "Policy" reform and "Pipes" improvement with ensuring there are sufficient, well trained technicians to support the build-out of ICT industries.

- ***People*—**Implementing new approaches to sustainable social and economic development through ICT tools. It is critical to the success of the program that USAID's partners use the Internet and other ICTs for development.

***Project Goal*—** The goal of the Asia and Near East Information and Communication Technology program is to have all ANE missions promoting one or more of the 4-P's in their development portfolio.

***Project Countries*—**Algeria, Bangladesh, Cambodia, Egypt, India, Indonesia, Jordan, Lebanon, Mongolia, Morocco, Nepal, Palestinian Authority, Philippines, Sri Lanka, and Tunisia.

Project Countries Activities

Countries	Assessment	Policies	Pipes	Private Sector	People
Algeria	Jan '01	⎤		⎤	
Bangladesh	Sept '00	⎤		⎤	⎤
Cambodia	Spring '01				⎤
Egypt	Summer '00	⎦	⎦	⎦	⎦
Gaza/WBank	Aug '00	⎤	⎦	⎦	⎦
India	Spring '01	⎤			⎤
Indonesia	Jan '01	⎤		⎤	⎤
Jordan	Sept '99	⎦		⎦	
Lebanon	Summer '01				⎤
Mongolia	Summer '00			⎦	
Morocco	Sept '99	⎦	⎦		⎦
Nepal	Spring '01				⎤
Philippines	Dec '00	⎦		⎦	⎦
Sri Lanka	Dec '99	⎤		⎤	
Tunisia	Oct '00		⎤	⎤	

⎤ = Proposed/ Planning Stage

⎦ = Engaged in

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www.usaid.gov/regions/ane/ict/internet.htm

Appendix D–Networked Readiness of Indonesia

During this last year, there have been several independent efforts to evaluate either the "e-readiness" or "networked readiness" of a given country. McConnell International and Harvard University have each developed valuable tools.

McCONNELL INTERNATIONAL'S GLOBAL E-READINESS REPORT

In August 2000, McConnell International issued its first E-Readiness Report.[1] This report assessed the e-readiness of 42 critical national economies, including Indonesia's. The report provides an independent public assessment of one of the most important economic questions of the early 21st century—*Who is poised to prosper in the networked economy?*

"E-readiness" measures the capacity of nations to participate in the digital economy. As such , it is the source of national economic growth in the networked century and the prerequisite for successful e-business. The report looks at the following five attributes:

- ***Connectivity***—Are networks easy and affordable to access and to use?
  - — Availability of wireline and wireless communication services, community access centers (free and paid), and networked computers in businesses, schools, and homes.
  - — Affordability and reliability of network access, including the cost of service, downtime, and the prevalence of sharing access among individuals.
  - — Reliability of electrical supply for business-critical computer operations; and the ease of importing and exporting goods and of transporting them within a country.
- ***E-Leadership***—Is e-readiness a national priority?
  - — Priority given by government to promoting the development of an e-society on a national level.
  - — Extent of demonstrated progress on e-government, including efforts to automate governmental processes.
  - — Quality of partnerships between industry leaders and government to improve e-readiness.
  - — Level of effort to promote access for all citizens.
- ***Information Security***—Can the processing and storage of networked information be trusted?
  - — Strength of legal protections and progress in protecting intellectual property rights, especially software.

[1] http://www.mcconnellinternational.com.

  - — Extent of efforts to protect privacy.
  - — Strength and effectiveness of the legal framework to address and prosecute computer crimes, authorize digital signature, and enable public key infrastructures.
- ***Human Capital***—Are the right people available to support e-business and to build a knowledge-based society?
  - — Quality of and participation levels in the education system, with an emphasis on efforts to create and support a knowledge-based society.
  - — Culture of local creativity and information sharing within the society.
  - — Skills and efficiency of the workforce.
- ***E-Business Climate***—How easy is it to do e-business today?
  - — Effective competition among communication and information services providers.
  - — Transparency and predictability of regulatory implementation, openness of government, rule of law, and general business risk (political stability, financial soundness).
  - — Openness to financial and personal participation by foreign investors in ICT businesses.
  - — Ability of the financial system to support electronic transactions.

The August 2000 Global E-Readiness Summary reflects the following for Indonesia:

- Connectivity—Red
- E-Leadership—Red
- Information Security—Red
- Human Capital—Red
- E-Business Climate—Red

The report uses a color rating system in assessing countries in these five areas. Blue indicates that the majority of conditions are suitable to the conduct of e-business and e-government. Amber indicates that improvement is needed in the conditions necessary to support e-business and e-government. And red indicates that conditions need substantial improvement. For more information on the details of this report, refer to their web site at http://www.mcconnellinternational.com or Roslyn Docktor (Vice President) at doctor@mcconnellinternational.com.

HARVARD'S *"READINESS FOR THE NETWORKED WORLD—A GUIDE FOR DEVELOPING COUNTRIES"*

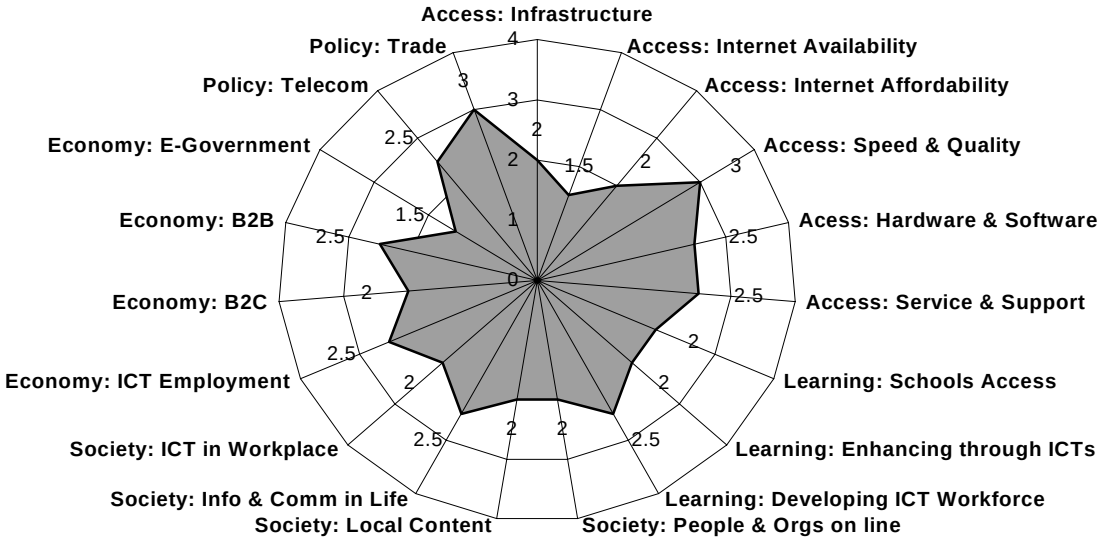
The Information Technologies Group (ITG) at the Center for International Development at Harvard University[2] has not as yet evaluated individual companies, but instead has created *Readiness for the Networked World: A Guide for Developing Countries.* The Guide "systematically organizes the assessment of numerous factors that determine the Networked Readiness of a community in the developing world."

[2] http://www.readinessguide.org.

This assessment relies on information published by the Information Technologies Group (ITG) at the Center for International Development at Harvard. It is included here as part of the ICT Assessment in an effort to gain familiarity with the Guide, to test its validity, and to determine its potential value to similar efforts in the future.

The figure below represents the values determined for each category of readiness in Indonesia. The following pages describe the five groups—access, learning, society, economy, and policy—and each category found in the guide. See the Readiness Guide for complete instructions, descriptions of each category, and the descriptions of each of the four stages for the categories.

Networked Readiness: Indonesia



Groups and Categories

Network Access

What are the availability, cost, and quality of ICT networks, services, and equipment?

The minimum necessary condition for readiness is access to adequate network infrastructure. Without access to global communications networks, no community can participate in the networked world. The availability and affordability of use of the network itself, as well as the hardware and software needed for network interface determine access. The quality and speed of the network are also important in determining how the network is used. The customer service orientation of access providers is a major factor in network application adoption and usability.

Because of the growing importance and unique character of the Internet, which provides a global platform for both data and (increasingly) voice services, the assessment of network access should be carried out in the context of Internet access, rather than access to either voice or data. The significance of the Internet to global trade and communications will only continue to grow.

- ***Information infrastructure***—For most communities in the developing world, a lack of access to voice and data services is a significant impediment to networked readiness. Communications infrastructure is deployed with widely varying local and regional rates of penetration, depending on geography and/or income levels. Local network access may be provided by any one of a number of media that make up the communications network (e.g., twisted pair copper wires, coaxial cable, wireless local loop, satellite, and fiber optics). In the future mobile wireless technologies will undoubtedly provide an attractive option for data access, as will cable networks and perhaps even the electrical grid, but most Internet access in the developing world is currently provided through the traditional telecommunications network.
- ***Internet availability***—Internet access is enhanced by competition among local Internet Service Providers (ISPs). The range of services offered, number of dial-up lines (which helps determine ISP capacity), and transmission capacity all influence an ISP's usefulness. The availability of leased lines is particularly important in making the Internet available to the business community. Finally, in many communities in the developing world, public access is essential to making the Internet available to greater numbers of individuals and firms. Telecenters, Internet cafes, and community information centers assume great importance in making the Internet available to those who do not have personal access at home, school, work, or elsewhere.
- ***Internet affordability***—The prices that businesses and individual consumers pay for the Internet access are in most cases determined by a combination of fees for basic telephony and ISP services. In communities where the sum of ISP and telephony fees is prohibitively high, a disincentive to network usage exists, and access is curtailed. Pricing packages can be structured in ways that are conducive to Internet use. For instance, per minute or hourly pricing (unlike flat rate pricing) for both Internet and telephone service can limit users' time online and therefore inhibit the use of the network for many activities such as e-commerce. Tiered pricing packages can improve the affordability by allowing many subscribers to purchase only what they need.
- ***Network speed and quality***—The available bandwidth, both for individuals' local access and for a community's connection to the Internet backbone, determines the number of users and types of online activities the network can support. Bandwidth-intensive activities, such as large file transfers or video streaming, may be unavailable to communities with constrained access to the network. The quality of the network, including servers, also determines its usage. High numbers of mainline faults, poor connections, dropped connections, and packet loss can render any network useless or operationally suboptimal, thus discouraging use of and investment in new technologies.
- ***Hardware and software***—A vibrant market with many hardware and software options can encourage more specialized use of the network, including ICT solutions that are tailored to local needs. More widespread retail and wholesale distribution channels for both hardware and software increases opportunities to use the network in the community. The prices of

hardware and software are particularly important in developing countries, where low-incomes cannot support high-priced consumer items.

- ***Service and support***—A strong customer service orientation is important in determining the success of network deployment. Long waiting periods for installation and repair and a lack of support services by telephone companies and Internet providers are major obstacles to readiness. The quality and number of technical support professionals are essential in maintaining the network and providing service.

Networked Learning

Does the educational system integrate ICTs into its processes to improve learning? Are there technical training programs in the community that can train and prepare an ICT workforce?

Without an educated, ICT-savvy populace, no community can fully participate in the networked world. To foster this resource, ICTs must be incorporated into the learning system. Lamentably, although the use of ICTs in education is one of the most powerful catalysts to networked readiness, it is an opportunity often squandered, misunderstood, or underestimated.

- ***School access to ICTs***—Programs that give students access to ICTs in the classroom provide are important in improving readiness. A school's readiness access can be measured by number of computers, physical access to the technology, types of computers, diffusion of the network, access to and organization of electronic content, and quality and speed of connectivity. In general, the diffusion of ICTs is driven by unit cost per pupil. Computers tend to be adopted first at the university level, then by the secondary school system, and finally by the primary schools.
- ***Enhancing education with ICTs***—While putting ICTs into schools is an important step to readiness, the technologies need to be properly harnessed to improve learning. Teachers must be trained to use the Internet and computers as tools for the students' benefit; this training is central to readiness. Curricula must be redesigned to encourage the use of ICTs in the pursuit of problem solving, group learning, and research. Students should be taught from the earliest age possible to use ICTs to enhance and improve learning. Full integration of ICTs into the learning process is optimal and collaborative. Project-based learning can constitute a solid pedagogical strategy for ICT-enhanced education.
- ***Developing an ICT workforce***—There must be first-time and continuing training opportunities in essential skills, such as software programming, hardware engineering, and Web design, for ICT workers. These opportunities are fundamental to creating a sustainable ICT industry and supporting the integration of ICTs into the local economy.

Networked Society

To what extent are individuals using information and communications technologies at work and in their personal lives? Are there significant opportunities for those with ICT skills?

Readiness depends upon the community's incorporation of ICTs into activities. In society-at-large, ICTs can profoundly affect people's professional and personal lives by providing easy access

to information, efficient communication, and powerful organizational tools. To understand how a community is using ICTs, it is important to assess not only how many members of the community have access to the technologies, but also how they are using them.

- ***People and organizations online***—One indicator that is difficult to track is the actual number of online users. Particularly in the developing world, where multiple users share many e-mail accounts and other online tools, there are few reliable indicators for mapping how many people are online. The exponential growth in online usage also makes tracking current use difficult. Nevertheless, online use is an important indicator. As more people use the Internet regularly, and networks of users grow, there is grater demand and opportunity for online interaction, as well as better meshing with the networked world. As more organizations gain an online presence, it becomes more likely that the community will use ICTs to augment or carry out its activities and needs. One of the most important drivers of online growth is awareness—people must first know and understand what the Internet is in order to participate. Particular attention should be paid to the demographics of Internet users in the community. Particularly at lower stages of readiness, groups such as women, the physically disabled, and racial and ethnic minorities often do not participate in the online environment. A community is more ready when there are not large discrepancies in online presence among different groups.
- ***Locally relevant content***—Community members find the Internet medium more useful and relevant to their own lives when online content reflects their interests and needs. Locally relevant content drives the growth of Internet use. Chat rooms, online interest groups, special interest software, bulletin boards, list serves, and Web sites all drive the community to use ICTs more widely in their lives. English language dominance on the Internet is a serious impediment to the world's non-English speaking communities. While other languages are gaining, most of the world does not speak a language that is strongly represented either in software or on the World Wide Web.
- ***ICTs in everyday life***—Communities participate more directly in the networked world when information devices such as radios, faxes, televisions, telephones, pagers and computers are culturally accepted and widely incorporated into daily life. It is important to examine both the penetration of ICT devices into community and their applications. In communities where income levels or the network infrastructure cannot support high levels of individual access, public shared facilities provide a needed alternative. Such venues may include telecenters, cyber cafes, and community information centers. Strategies for drawing people in to use these facilities are essential.
- ***ICTs in the workplace***—The more that businesses and government offices are already using ICTs, the better prepared they are to participate in the global networked economy. To realize important efficiency gains from ICTs, businesses and governments need to make technologies available to their employees and effectively incorporate them into their core processes.

Networked Economy

How are businesses and governments using information and communications technologies to interact with the public and with each other?

Businesses and governments that effectively use ICTs find more sophisticated and efficient ways to manage their external relationships and communications. This growing ICT usage helps form the critical mass of electronic transactions which supports a networked economy, both in network size and the demand for associated goods, services, labor, and policy reform.

- ***ICT employment opportunities***—A thriving job market for ICT professionals provides greater incentive for growth of ICT adoption, training programs, and use of ICTs in an economy. Retaining technical workers becomes an important competitiveness issue for the community.
- ***Business-to-consumer (B2C) e-commerce***—Online retail options give consumers greater choice and access to products. They also let businesses reduce costs associated with physical infrastructure and augment marketing and public relations via a dynamic communications channel.
- ***Business-to-business (B2B) e-commerce***—When businesses move their dealings with other businesses online, they can often communicate more easily at lower costs, hold smaller inventories, and process billings and payments more quickly. Moreover, networked businesses are likely to explore new business models, including dynamic business partnerships and radical market restructuring.
- ***E-government***—Governments can use ICTs to improve relationships with their constituents by making activities more transparent. They can use the Internet to post information, offer interactive public services, and streamline contracting and procurement. Leading by example, governments can become catalysts for the networked economy by investing in ICTs for their internal use, leading to more efficient operations and the creation of a local market for ICT equipment and services.

Network Policy

To what extent does the policy environment promote to hinder the growth of ICT adoption and use?

Public policy can help or hinder the networked economy. Public policy can create a favorable climate for Internet use and e-commerce by encouraging communities, organizations, and individuals to invest in and use ICTs. Important aspects of networked readiness dealt with elsewhere in the Guide (such as Internet availability and affordability, hardware and software availability and affordability, ICTs in school, and electronic commerce) are all influenced by public policy. For a community to become ready for the networked world, policymakers must realize how their decisions affect ICT adoption and use.

- ***Telecommunications regulation***—Effective regulation should promote competition, ensure affordable pricing for consumers and maximize telecommunications access. Liberalization in the telecommunications sector should establish a regulatory framework that encourages multiple carriers to operate competitively. As more operators enter and compete in the

marketplace, service offerings improve and deploy rapidly and become more accessible and affordable. At the same time, regulation should encourage universal access to telecommunications services.

- ***ICT trade policy***—ICTs become more available and affordable when there are few barriers to trade, including tariffs on ICT equipment and software and electronically ordered or delivered goods and services.

Appendix E–Main Government Initiative

INDONESIAN ICT/TELEMATICS COORDINATING TEAM (*TIM KOORDINASI TELEMATIKA INDONESIA, TKTI)*

TKTI was initially established by the Presidential Decree No. 186/1998 and reorganized under the directives of the Presidential Decree No. 50/April 7, 2000 based on the Constitution UUD 1945 Chapter 4 (1). In anticipation of the increasing demand for information technology and telecommunications goods and services, the Government of Indonesia formed the team to coordinate and identify synergies in the development of relevant infrastructure, applications, and resources to

- Formulate ICT policy;
- Plan and prioritize the development and utilization of ICT in Indonesia;
- Monitor ICT activities;
- Report on ICT developments to the President.

Organizational structure

Chairperson	Vice President, Mrs. Megawati Soekarnoputri
Vice Chairperson I	Coordinating Minister of Economics, Finance and Industry, Dr. Rizal Ramli
Vice Chairperson II	Minister of Administrative Reform
Secretary	Deputy Minister of Administrative Reform Professor Dr. J. B. Kristiadi Jl. J. Sudirman Kav. 69 Jakarta 12190 Tel: 62 21 739 8355 (direct), 62 21 739 8381 ext. 2053 Fax: 62 21 525 2720, 62 21 527 0948 Email: krista@telematika.go.id

Executive Team

Minister of Interior Affairs	Minister of Defense
Minister of Justice and Human Rights	Minister of Finance
Minister of Industry and Trade	Minister of Communications and Telecommunications
Minister of Manpower	Minister of Health and Social Welfare
Minister of National Education	State Minister of Research and Technology
State Minister of Regional Autonomy	State Minister of Tourism and Arts
State Minister of Investments and State Enterprises	State Minister of Public Works
State Secretary	Head of National Planning Agency

Appendix F–Key Private Initiative

ACTIVITIES OF INDONESIAN ICT/TELEMATICS NATIONAL MOVEMENT (*GENETIKA*), FEBRUARY 2, 2001

GENETIKA activities include the following:

	Activity	***Number of activities***
1.	Network and Infrastructure Development	7
2.	Education and Training	5
3.	Applications Development	8
4.	Community Development	7
5.	Development of Strategy and Policy	4
6.	Development of Telematics Industrial Centers	5
7.	Seminars, Conferences and Publication	9
8.	Exhibition and Promotion	12
	Total number of activities	57

Translated from the list compiled by Mr. M. W. R. Setiyadi, member of Telematics Compartment, KADIN, Tel:+62 21 2514750 Fax:+62 21 251 4751. E-mail: maswig@cabi.net.id.

	Activities	Contact Person	Implementing Organizations	Status
Network and Infrastructure Development				
1	Satellite Access Node	Rudy Rusdiah	Internet Cottages Association (AWARI)	Planning stage
2	National Internet Broadband Network	Heru Nugroho	Indonesia Internet Services Association (APJII)	
3	Biznet Data Center	Adi Kusma	Supra Primatama Nusantara	Launch date: on 2/28/01
4	Development of (2nd backbone) Data Communication Network, Earth Station Communication System (VSAT)	Benny Nasution	ICT Society (MASTEL) and Warnet Cooperative (INKOPWI)	Planning stage
5	Development of ISPs in the regions		Combined activity between several assoc.'s	Planning stage
6	Increased Internet	Gatot HP	Education, Training and Technical Colleges (Dikmenjur)	Work-in-progress
7	Broadband for Warnet (Community Tele Centres) Network	Aday	Internet Kiosk Cooperative of Indonesia (KWI)Operational in Bandung	
Education and Training				
1	Schools (Sekolah) 2000	Heru Nuroho	Indonesia Internet Services Association (APJII)	Operational
2	IT-Vocational High School (SMK-TI: 24-100-350)	Gatot HP	Dikmenjur	Operational
3	Distance Learning Facilitation	Rudi Rusdiah	AWARI - Open University (Univ. Terbuka)	Planning stage
4	Certification of Telematics Competence	Rudi Rusdiah	AWARI - Dikmenjur	Planning stage
5	Training for Trainers in Electronics Commerce	Onno W. Purbo	APEC-Foreign Ministry (Deplu)	Under negotiation
Applications Development				
1	Multimedia software houses in Technical Schools (SMK-TI)	Gatot HP	Education, Training and Technical Colleges (Dikmenjur)	Work-in-progress
2	RI-NET, prototype e-government	Budi Rahardjo/Freddy		
3	Infrastructure Data Spatial (IDS)	Klass Villanueva	National Surveyor and Mapping Agency (Bakosurnatal)	
4	Development of National Portal for the Republic of Indonesia	Deputy IV Menpan	Indon. Coordinating Team for Telematics (TKTI)	Planning stage
5	Bilingual Web Based Learninn		R&D Division (DivRisTI), PT Telkom	Planning stage
6	Web-based School Integrated Management System			Planning stage
7	Business Information Center (BIC), Center for Enterpreneurship, APEC/KADIN	Hillman Sulaiman	Integ., Applications..Association (APPKAI) and APEC	Work-in-progress
8	Certification Authority for Digital ID & e-government (I-trustonline.com, PT Telkom)	Hillman Sulaiman	Integ., Applications..Association (APPKAI) and APEC	Work-in-progress

	Activities	Contact Person	Implementing Organizations	Status
Community Development				
1	Community Information Center (Balai Informasi Masyarakat - BIM)		ICT Society (Masyakat Telematika, Mastel)	Planning stage
2	IT Community Development in the ITB Campus		Institute Technology Surabaya (ITS)	Work-in-progress
3	Ciayumajakuning Project	M. Arif Rahman	Univ. Muhammadiyah, Cirebon, West Java	Work-in-progress
4	Desa Maju	Suryatin Setiawan	DivRisT, PT Telkom	Work-in-progress
5	Community of Indonesian Schools (Komunitas Sekolah Indonesia - KSI)		Multimedia Division (MM), PT Telkom	Work-in-progress
6	Knowledge Infrastructure - Library Network in Indonesia		Indonesia Data Library Network (IDLN), Bandung Inst. Tech. (ITB), Agriculture Inst. Bogor (IPB) and others	Operational from 10/3/2000
7	Jihad IT - a program for Islamic Religious Schools (Pesantren)		PesantrenNet - Jaringan Informasi Islam	Operational
Development of Strategy and Policy				
1	Development of the National IT Framework		National Planning Agency (Bappenas)	Work-in-progress
2	Formulation of the Indonesian ICT (Telematic) Policy		Indon. Coordinating Team for Telematics (TKTI)	Work-in-progress
3	Formulation of the Draft Cyber Law Act		4 different gov't agencies with universities	Work-in-progress
4	Establishment of the Independent Regulatory Body		Mastel, Min. of Communications and Transp.	Work-in-progress
Development of Telematics Industrial Centers				
1	Bandung High Tech Valley (BHTV)		Businesses & local gov't (Pemda) consortium	Work-in-progress
2	Bogor High Tech and Cyber World	Michael Sungiardi	Businesses & local gov't (Pemda) consortium	Work-in-progress
3	Bali Camp	Toto Sugiri	Business initiative	Operational
4	Malang Information Technopark (MIT)		Businesses & local gov't (Pemda) consortium	Planning stage
5	Multimedia Infocomm Resort (MIR) - Yogyakarta		Businesses & local gov't (Pemda) consortium	Planning stage
Seminars, Conferences and Publications				
1	Millennium Internet Roadshow 2001		Indonesia Internet Services Association (APJII)	Commencing in March, 2001
2	VoIP Panel Diskusi		Internet Cottages Association (AWARI)	Planning stage
3	Indonesian ICT Journal (Tabloid Telematika Indonesia)		Chambers of Commerce (Kadin), Telematics Section and Media Informasi Bangsa	
4	Telset Magazine (telematics life style, new products and current affairs magazine)		PT Telset Media Global	
5	Familiarizing IT book (Buku Gaul IT)		IT Environment Foundation (YLTI)	
6	CD-ROM on IT (free distribution)		Computer Traders Association (APKOMINDO)	
7	Publication and public campaign on wireless spread spectrum management	Rudy Rusdiah	MASTEL, Directorate Gen. Postal & Telco (Ditjen Postel)	

	Activities	Contact Person	Implementing Organizations	Status
8	Dotnet publication	Agung Hermawan	PT Media Informasi Bangsa	Operational
9	Seminar, workshop and talkshows on IT issues	Onno Purbo, et al.		Commenced
Exhibitions and Promotions				
1	2nd Asia-Pacific Telecom. & Info. Tech. Forum and Exhibition (Aspactel)		MultiMediaPromo & APJII	May14-17, 2001
2	2nd Indon. Int. Telecom, Media & Info. Tech. Conf. & Exhib. (IITELMIT)		Rantai Expo Indonesia	May 27-31, 2001
3	Telematika 2001 Expo		Feraco	April, 2001
4	Intechcom, 2001		Bhatara	April, 2001
5	INDOPAGE Directory and Search Engine of Indonesian Companies (website and hardcopy)		Karyaasta Ultra Media	Completed
6	Software Exchange House and Indonesia Expo 2001		Debindo	March, 2001
7	Mega Bazaar for Computers		Dyandra Promosindo	March, 2001
8	Festival Komputer Indonesia		Dyandra Promosindo	June, 2001
9	Focus 2001		Dyandra Promosindo	June, 2001
10	E-Biz 2001		Dyandra Promosindo	Sept., 2001
11	INDOCOMTECH 2001		Dyandra Promosindo	October, 2001
12	Techno Pre Eminent (TPE)		R&D Division of PT Telkom	October, 2001

Appendix G–1999 ITU Statistics

Each year the International Telecommunications Union (ITU) publishes a World Telecommunications Development Report[1] that provides statistical data for all countries. Its most recent worldwide report, issued October 1999, for the first time included data on mobile cellular. In December 2000 the ITU published *Asia-Pacific Telecommunication Indicators 2000*[2], which reflects updated data (1999 statistics). This report was an excellent source of base data for examining the "pipes" portion of our analysis—upon which additional and updated information was collected and included in the analysis of the telecommunications infrastructure in Indonesia. The report included data on Asia-Pacific countries, grouped as follows:

- ***Lower-income countries*—**Bangladesh, Cambodia, China, Fiji, India, Indonesia, Kiribati, Lao P.D.R., Malaysia, Maldives, Nepal, Pakistan, Papua New Guinea, Philippines, Samoa, Solomon Island, Sri Lanka, Thailand, Tonga, Vanuatu, and Viet Nam;
- ***Upper-income countries*—**Brunei Darussalem, French Polynesia, Guam, Hong Kong SAR, Korea (Republic), Macau, New Caledonia, Singapore, and Taiwan-China
- ***Developed countries*—**Australia, Japan, and New Zealand.

For purposes of this analysis, Indonesia data has been extracted from the most recent ITU Asia-Pacific report and compared to the country averages in each of the three country income categories used by the ITU, as well as to the average for all Asia-Pacific countries. The following tables provide more details on Indonesia. Notes and comments accompany each table.

These averages provide a benchmark for comparing Indonesia with neighboring countries, but data on China (with a population placed at 1,266.84 million) and India (with a population of 998.06 million) are included. These two countries alone account for over 70 percent of the regional population and nearly 60 percent of its regional GDP as report by ITU. Even Indonesia with its population of 209.25 million is large enough to affect regional data (third largest population in the Asia-Pacific region and fourth largest populated country in the world).

[1] World Telecommunications Development Report—1999. Mobile and World Telecommunications Indicators. ITU. Geneva, Switzerland. 10 October 1999.

[2] Asia-Pacific Telecommunications Indicators 2000. ITU. Geneva, Switzerland. 3 December 2000

Basic Indicators

Country	Population - 1999		GDP - 1998[1]		Main Phone Lines	
	Total (Millions)	Density (per km)	Total (US$ B)	Per Capita (US$)	Totals (000s)	Teledensity[2]
Indonesia	209.25	109	124.8	605	6,080.2	2.91
Lower-Income Total/Avg.	3,196.34	139	2,380.7	755	170,435.7	5.33
Upper-Income Tot/Avg.	80.93	489	856.0	10,672	38,742.7	47.89
Developed Tot/Avg.	149.30	18	4,216.4	28,292	82,263.9	55.10
Asia-Pacific Tot/Avg.	3,426.57	109	7,453.1	2,204	291,442.3	8.81

NOTES:

1. Calculations for GDP vary considerably according to source and calculations used. However, here it is presented by ITU's methodology and normalized across all countries in a consistent manner and therefore retained for comparison purposes.
2. Teledensity is the number of phones per 100 inhabitants

Observations

- Indonesia has a slightly lower population density (109 per square kilometer) than the region's other lower-income countries (average of 139).
- Indonesia's calculated per capital GDP is slightly lower than other lower-income countries in the region (with Indonesia's per capita GDP for 1998 at US$ 605 as compared to an average US$ 755for the lower-income countries in the region).
- Indonesia's teledensity (telephone lines per 100 inhabitants) is significantly below the average for the lower-income countries in the region, and drastically below the neighboring upper-income and developed countries (Indonesia's teledensity is 2.91 and the average for all lower-income countries in the regions is 5.33).
- With China's population of 1,266.84 million and a reported teledensity of 8.58, the lower-income average for teledensity is somewhat inflated. When China is factored out, the teledensity average is closer to 3.20—which places Indonesia's teledensity closer to the regional average for lower-income countries, but still lower than average.
- India's numbers are close to the average for the lower-income countries (India's teledensity is 2.66).

Main Telephone Lines

Country	Main Telephone Lines			Teledensity		
	1995 (000)	1999 (000)	CAGR (%)* 1995-1999	1995	1999	CAGR (%) 1995-1999
Indonesia	3,290.9	6,080.2	16.6	1.69	2.91	14.5
Lower-Income	74,19.9	170,435.7	23.1	2.45	5.33	21.4
Upper-Income	32,864.5	38,742.7	4.2	42.53	47.87	3.0
Developed	71,724.8	82,283.9	3.5	42.53	47.87	3.0
Asia-Pacific	178909.2	291,442.3	13.0	5.49	8.51	11.5

NOTES:

*CAGR = Compound Annual Growth Rate

Observations

- Between 1995 and 1999, Indonesia's growth in main telephone lines was rapid, but somewhat below the lower-income country average for the region (with a compound annual growth rate of 16.6 percent compared to lower-income country average of 23.1 percent).
- Viewed from a per population (teledensity) perspective, Indonesia's growth is even less as a percent as it takes into account the growth in population. (Teledensity between 1995-1999 in Indonesia had a CAGR of 14.5 percent compared to a CAGR of 16.6 percent in the number of lines).
- Clearly there is some "catching up" taking place in Indonesia and the other lower-income countries relative to the upper-income and developing countries. CAGR for lower-income countries is more than 20 percent and only 3 percent for upper-income and developed countries. (Growth rates typically start to drop off when a country reaches a teledensity level of 30-40.) Also the growth in deployment of mobile wireless telephony frequently serves as a substitute for main telephone lines and therefore must be factored in.
- China and India again have a significant impact on the averages for the lower-income countries in the region. Between the two of them, the number of main telephone lines account for 71 percent and 79 percent of the number of lines in the region for 1995 and 1999, respectively.
- While not in these data, another indicator frequently used to reflect limitations on growth are waiting list data. Unfortunately, the December 2000 ITU report on Asia-Pacific countries does not contain any waiting list data for Indonesia. But, at the lower-income, upper-income, developed and Asia-Pacific regional level, there are few exceptions where this appears to be a significant issue (average waiting time in years placed at 0.3).

Local Telephone Network

Country	Main Telephone Lines - 1999				Faults per 100 Main Lines/year 1999
	Capacity Used (%)	Automatic	Digital (%)	Residential (%)	
Indonesia	72.7	100.0	100.0	77.5	13.2
Lower-Income	72.0	99.9	97.8	78.9	103.5
Upper-Income	81.6	100.0	85.2	72.8	1.5
Developed	---	100.0	100.0	69.6	46.0
Asia-Pacific	73.6	100.0	96.7	75.2	63.7

Observations

- Indonesia's telephone system is 100 percent digital.
- Indonesia's faults per line per year are among the lowest in the region, with 13.2 faults per 100 main lines per year compared to 103.5 for lower-income countries.
- Indonesia's build-out of infrastructure is such that there is ample capacity to support more growth in the number of lines (with only 72.7 percent of the capacity used as of 1999).
- The percent of residential subscribers for Indonesia is in keeping with the averages for the region, with 77.5 percent of the main telephone lines in 1999 being residential.

Tele Accessibility—1999

Country	Residential Main Lines		Public Telephones		
	Total (000s)	Per 100 Households	Total (000s)	Per 1000 Inhabitants	As % of Main lines
Indonesia	4,318.0	9.2	269.24	1.29	4.43
Lower-Income	107,041.9	22.5	4,053.21	1.32	2.61
Upper-Income	28,047.5	112.1	745.06	9.23	1.93
Developed	51,667.0	97.5	820.47	5.50	1.00
Asia-Pacific	186,756.3	33.8	5,618.74	1.70	2.03

Observations

- Indonesia's 9.2 main lines per 100 households is among the lowest of lower-income countries in the region (average is 22.5 percent).
- There is some compensation of this low per household penetration. Indonesia has the highest percentage of its main lines dedicated to public access—4.43 percent against an average of 2.61for lower-income countries.

Largest City Main Lines—1999

Country	Largest City				Rest of Country	Overall Country Teledensity
	Population as % of Total	Main Lines		Teledensity		
		(000s)	% of Total			
Indonesia	4.6	1,555.3	25.6	16.33	2.27	2.91
Lower-Income	3.3	16,116.1	11.1	16.23	4.27	4.65
Upper-Income	29.6	13,505.8	35.9	56.23	43.85	47.61
Developed	9.1	9,921.5	11.2	72.31	53.75	55.34
Asia-Pacific	4.1	38,643.4	14.7	28.46	7.00	7.87

Observations

- The ITU data reflects the predominance of Indonesians living in rural areas (with only 4.6 percent living in the largest city) and while the percent reflects more than the average for lower-income countries in the region (4.6 percent as compared to 3.3 percent), this is due in large part to the data being skewed by the large populations of China and India, where the percent of urban population is considerably less than Indonesia (China has 1.2 percent living in large cities and India 1.7).
- Indonesia's teledensity data reflects a significant gulf between main lines available to those living in urban areas (teledensity of 25.6) and those living in the rural areas (teledensity of 2.27).
- This city/rural difference in Indonesia is more pronounced than in other lower-income countries in the region.

Telephone Tariffs—1999

Country	Residential (US$)		Business (US$)		Local Calls US$	% GDP per Capita*
	Connection	Monthly Subscription	Connection	Monthly Subscription		
Indonesia	38	2.9	57	5.0	0.02	4.2
Lower-Income	104	4.2	111	6.1	0.06	9.2
Upper-Income	70	9.3	73	16.2	0.08	0.7
Developed	261	14.1	261	23.6	0.08	0.9
Asia-Pacific	109	6.4	114	10.1	0.07	6.4

NOTES:

*The % GDP per capita reflects 1998 data, and reflects the subscription as a percent of GDP per capita

Observations

- Indonesia's connection and monthly subscription pricing for both residential and business is significantly below other lower-income countries in the region. (connection price of US$ 38 compared to US$ 104; monthly subscription of US$ 2.9 compared to US$ 4.2 for lower-income countries; similar but less profound differences for businesses).
- Indonesia's local call pricing is also considerably below that of others in the region (US$ 0.02 compared to US$ 0.06).
- On a percent GDP per capita Indonesia's telephone tariffs seem significantly lower than those of lower-income countries in the region, but higher than both the upper-income and developed countries. (Indonesia's percent GDP per capita is 4.2 whereas the average per capita rate of lower-income countries in the region is 9.2 percent). Note: ITU data reflects that the average worldwide is about 1.5 percent to 2.5 percent, including all telecommunications costs.
- With these numbers in mind, there may be reason to suspect that the pricing for connection, monthly subscription, and local calls could be below cost and that there is some tariff cross-subsidization and a need for some rebalancing (further analysis needed).
- In so far as population and numbers of lines do not affect this data, there is no unique distortion by China and India in these averages.

Cellular Subscribers

Country	Cellular Mobile Subscribers					As % of
	Subscribers (000s)		CAGR %	Teledensity	% Digital	Total
	1995	1999	1995-1999	1999	1999	Telephone
Indonesia	210.6	2,221.0	80.2	1.06	100.0	26.8
Lower-Income	6,872.4	57,119.9	69.8	1.79	84.4	25.1
Upper-Income	3,596.5	41,111.7	83.9	50.80	98.9	51.5
Developed	14,319.1	64,227.6	45.5	43.02	97.9	43.8
Asia-Pacific	24,788.0	162,459.1	60.0	4.74	93.4	35.8

Observations

- Indonesia's growth in cellular subscribers is appreciably greater than other lower-income countries in the region—with a CAGR between 1995 and 1999 of 80.2 percent (compared to the lower-income country average of 69.8 percent).
- Indonesia's growth rate in cellular mobile is one of the fastest among lower-income countries, with only India, China, and Bangladesh growing at a faster rate.
- Indonesia's cellular mobile systems are 100 percent digital, whereas some of the others are not (a very small number of analog capacity is being provided by four operators).

- Over one-quarter of Indonesia's telephone subscribers are mobile subscribers (26.8 percent of the total telephone subscribers are wireless).

International Telephone Traffic—1999

Country	Outgoing Telephone Traffic					International Circuits (000)
	Million Minutes		CAGR %	Minutes Per	Minutes Per	
	1995	1999	1995-1999	Inhabitant	Subscriber	
Indonesia	206.6	285.1	8.4	1.4	46.9	6.1
Lower-Income	3,116.7	4,557.3	10.0	1.4	26.7	127.7
Upper-Income	3,771.2	5,642.5	10.6	69.9	145.9	80.8
Developed	2,868.0	3,690.6	6.5	24.7	44.9	35.1
Asia-Pacific	9,756.0	13,890.4	9.2	4.1	47.7	243.5

Observations

- Indonesia's growth in outgoing telephone traffic between 1995 and 1999 is consistent with other countries in the region (CAGR of 8.4 percent for Indonesia and a 10 percent average for lower-income countries.). This period includes the financial crisis.
- Indonesia's international traffic on a *per inhabitant* basis is also in keeping with other lower-income countries in the region (1.4 minutes per inhabitant).
- Indonesia's international traffic on a *per subscriber* basis is considerably higher than other lower-income countries in the region (46.9 minutes per subscriber as compared to an average 26.7 minutes for the lower-income countries). But this average is distorted because of the large populations of India and China, and low minutes per subscriber (19.9 in both cases).

Telecommunications Staff—1999

Country	Telecommunications Staff			Main Lines per Employee		
	(000s)		CAGR %	1995	1999	CAGR %
	1995	1999	1995-1999			1995-99
Indonesia	39.8	45.0	3.1	83	135	13.1
Lower-Income	1,235.2	1,466.7	4.4	59	114	17.9
Upper-Income	143.9	163.2	3.2	228	237	1.0
Developed	299.0	272.9	-2.3	240	301	5.9
Asia-Pacific	1,678.1	1,902.8	3.2	106	152	9.4

Observations

- Data for Indonesia reflects that its operational efficiencies are improving. The number of main lines being supported per employee was up considerably from 83 per employee in 1995 to 135 in 1999.
- Staff increases between 1995 and 1999 are on the order of a CAGR of 3.1 percent compared to the number of lines having a CAGR for this period of 13.1 percent.
- This ratio is not in keeping with the upper-income and developing countries where the number of lines per employee is on average on the order of 200-300.

Telecommunications Revenue—1999

Country	Total (M US$)	Per Inhabitant (US$)	Per Main Line (US$)	Per Employee (US$)	As a % of GDP
Indonesia	1,670.3	8.0	275	37,119	0.9
Lower-Income	50,244.2	16.0	299	34,715	1.5
Upper-Income	34,017.5	420.8	881	209.701	3.2
Developed	153,334.4	1,027.0	1,864	571,504	2.9
Asia-Pacific	237,596.0	70.3	822	129,589	2.5

Observations

- Indonesia's telecommunications revenue on a *per inhabitant* basis is among the lowest in the region (US$ 8 compared to an average of US$ 16 for lower-income countries in the region).
- Indonesia's telecommunications revenue on a *per line* basis is below the lower-income country average (US$ 275 versus US$ 299), but this average is distorted because of China with its reported US$ 33,670.3 million in total revenues (out of a total for the lower-income countries of US$ 50,244.2 million) and US$ 310 per main line revenue. If China were factored out of the data, the average revenue per line for the lower-income countries would be substantially lower and Indonesia's revenue per line would actually be above the average.
- To a large degree this relatively high revenue per main line is the result of low teledensity and therefore more use (thus revenue) per main line.
- Indonesia's telecommunications revenue as a percent of GDP is also among the lowest in the region (telecommunications revenue is only 0.9 percent of GDP as compared to an average for the lower-income countries of 1.5 percent).
- As with connection, subscription, and local call pricing, these numbers support the possibility that pricing could be below cost and that there is some tariff cross-subsidization taking place (e.g., long distance and international) and that some tariff rebalancing is likely needed (further analysis needed).

Telecommunications Investment

Country	Total (M US$)	Per Inhabitant (US$)	Per Main Line (US$)	As % of Revenue	As a % of GFCF*
Indonesia	263.8	1.3	43	15.8	---
Lower-Income	25,761.2	8.2	153	51.5	4.1
Upper-Income	10,188.6	127.5	269	35.5	3.9
Developed	34,837.1	233.4	424	22.7	3.0
Asia-Pacific	70,786.9	21.1	246	30.5	3.4

NOTES:

*GFCF = Gross Fixed Capital Formation

Observations

- Indonesia's telecommunications investment *per inhabitant* basis is amongst the lowest in the region (US$ 1.3 per inhabitant compared to an average of US$ 8.2 for all lower-income countries in the region).
- Indonesia's telecommunications investment on a *per main line* basis is amongst the lowest in the region (US$ 43 per main line compared to an average of US$ 153 for lower-income countries in the region).
- Indonesia's telecommunications investment as a percent of revenue is amongst the lowest of the lower-income countries (15 percent of telecommunications revenues put back into investments in Indonesia compared to an average of 51.5 percent for lower-income countries).

Internet in Asia-Pacific—1999

Country[1]	# of ISPs	Internet - 1998				Personal Computers	
		Users (June 00)		Subscribers	Int'l Bandwidth (Mbps)	Total (000)	Penetration %
		(000s)	Penetration				
Indonesia	35	1,000	0.48%	125	---	1,900	0.9%
Developing	748	26,815	0.80%	5,466	857	31, 174	1.0%
4-Tigers[2]	277	26,157	32.9%	15,802	3,252	16,553	20.9%
Developed	4,811	33,600	22.5%	12,683	3,496	47,350	31.7
Asia-Pacific	5,836	86,572	2.5%	33,951	7,605	95,077	2.8%

NOTES:

1. Note different country categories.
2. Hong Kong SAR, Korea (Rep), Singapore, and Taiwan-China

Observations

- The ITU data reflects that as of June 2000 there were 125,000 Internet subscribers in Indonesia and 1,000,000 users.
- On a percent of penetration basis, Indonesia's penetration of Internet is considerably below the average for developing countries in the region (0.48 percent compared to 0.80 percent).
- As a percent of population, the numbers of personal computers in Indonesia is consistent with the average for developing countries in the region (0.9 percent compared to 1.0 percent).
- The differences in Internet and personal computers penetration between the developing countries (including Indonesia), the 4-Tiger countries and the developed countries are staggering (for Internet, less than 1 percent as compared to 33 percent and 22 percent respectively; and for personal computers, 1 percent as compared to 21 percent and almost 32 percent respectively).
- The ITU data reflects that there are 1,900,000 personal computers in Indonesia.

Dial-up Internet Access Prices in Asia-Pacific

Country	Internet Access Costs – October 2000 (US$)						
	ISP Fees					Telephone Call Charge[2]	Total Charge
	Sign-up	Monthly	Free Hours	Excess Time	Total Charge[1]		
Indonesia	8	8.46	15	6.99	15.45	21.21	36.66
Lower-Income	23	17.43	13	29.09	46.52	12.37	58.89
Upper-Income	2	17.94	7	3.82	19.35	23.50	42.85
Developed	---	21.19	40	---	21.19	21.01	42.20
Asia-Pacific	15	18.01	16	19.44	36.35	16.33	52.68

NOTES:

1. Total ISP fees are amounts payable to the ISP calculated on the basis of 30 hours per month use.
2. Telephone call charges are amounts payable to the local telephone company for local telephone charges while logged onto the Internet based on 30 hours per month use (with half being peak and half being non-peak time)

Observations

- ISP-related Internet access costs (signup, monthly, and excess time) are all quite low in Indonesia as compared to other lower-income countries in region.
- Telephone call charges for accessing the Internet in Indonesia are among the highest of the lower-income countries in the region, and well above the average for all countries.
- Total costs (ISP and telephone charges) are below the average for not only the lower-income countries in the region, but also for the upper-income and developed country averages.

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