Asia-Pacific
Economic Cooperation

APEC PROJECT

Development of “APEC Guidance for Electronic Commerce”,

Using the Best Practices of E-government Procurement Systems”

Final Report

APEC Electronic Commerce Steering Group
Russian Information Technology Association

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Prepared By

Russian Information Technology Association

15, build 8, Yaroslavskaya Str.

Moscow 129366 Russia

Tel: +7 (495) 797 8990

Fax: +7 (495) 617 6155

Email: Makarycheva@parus.ru

Website: www.ritarussia.ru

FOR THE ASIA-PACIFIC ECONOMIC COOPERATION

SECRETARIAT

35 Heng Mui Keng Terrace Singapore 119616

Tel: (65) 6775-6012 Fax: (65) 6775-6013

Email: info@apec.org

Website: www.apec.org

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List of abbreviations

APEC – Asian Pacific Economic Cooperation

ASEAN -- Association of South-East Asian Nations

B2B – Business-to-Business

C2B – Citizen-to-business

C2C – Citizen-to-Citizen

CA -- certification authority

CIS -- Commonwealth of Independent States (Union of former USSR republics)

CTI -- Committee on Trade and Investment

EC -- Electronic Commerce

eccma -- Electronic Commerce Code Management Association

e-commerce -- Electronic Commerce

ECOTECH -- Economic and Technical Cooperation

ECSG – APEC E-Commerce Steering Group,

e-GP -- e-government procurement

E-payment – electronic payment

G2B – Government-to-Business

GBD -- Global Business Dialogue (on Electronic Commerce)

ICC – International Chamber of Commerce

ICO – International Customs Organisation

ICT -- information and communications technology

NECS – National Electronic Commerce System

OAA -- Osaka Action Agenda

RITA -- Russian Union of IT Associations

SME – Small and Medium Enterprises

SPS -- Electronic Sanitary and Phytosanitary

TTP -- trusted third party

UNSPSC® -- United Nations Standard Products and Services Code®

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EXECUTIVE SUMMARY

This project is aimed at helping APEC economies **Governments to establish friendly conditions for development of** National Electronic Commerce and then to integrate them on multi-national global level for paperless trade. Such approach is based on considering "… the enormous potential of electronic commerce to expand business opportunities, reduce costs, increase of efficiency, improve the quality life, and facilitate the greater participation of small business in global commerce." (1998 APEC Leader's Declaration, APEC Blueprint for action on Electronic Commerce).

As declared in APEC Blueprint for action on Electronic Commerce "the different stages of development of member economies, the diverse regulatory, social, economic and cultural frameworks in the region" as well as understanding "…that enhancing capability in electronic commerce among APEC economies, including through economic and technical cooperation (…), is needed to enable all APEC economies to reap the benefits of electronic commerce" should be taken in account while developing National Electronic Commerce

The barest necessity of present research and analysis is due to the fact that the modern pace of development of economic relations including international expect active drawing of perspective and up-to date methods and technologies as well as efficacious participation of all involved parties in Electronic Commerce development as a part of trade linearization policy.

The present project aims to create an "APEC Guidance for Electronic Commerce, Using the Best Practices of E-government Procurement Systems" which will correspond to strategy declared in "APEC Strategies and Actions toward a Cross-Border Paperless Trading Environment" by Electronic Commerce Steering Group, September 30, 2004:

- Till 2010 "Most member economies establish a domestic paperless trading environment and implement pilots for the cross-border electronic transmission of customs clearance data", then
- "… collaborate with international organizations to pursue common standards and procedures, elements, formats and interoperability frameworks…"

The project will also use the Global Business Dialogue on Electronic Commerce (GBDe) "Private Sector Recommendation to Government on Realization of e-Government" of September 14, 2001 for development of more specific and detailed "Private Sector Recommendation to

Government on Realization of e-Procurement" using the best practices of APEC members and other countries.

So based on the above considerations and "2006 Stocktake of Electronic Commerce Activities in APEC" this **project objectives** are:

1. To analyse best practice in e-government procurement systems and e-commerce markets in few APEC economies and other countries.
2. To develop concept of possible national e-commerce system for APEC economy.
3. To develop roadmap for creating guidance for national e-commerce system build up in APEC economies.
4. To report results of above research at the Conference to be held in the forth quarter of 2006 in Moscow, Russia with following approval of approaches for developing "APEC Guidance for Electronic Commerce".

Following sources of best practices in E-government Procurement Systems were used in the project:

1. In early 2001 World Bank opened **Error! Reference source not found.** "Electronic government procurement" portal (http://wbln0018.worldbank.org/OCS/egovforum.nsf/main/home).
2. At the beginning of 2003, an e-GP working group was created under the Multilateral Development Banks (MDBs) Procurement Harmonization Process, (http://www.mdb-egp.org).
3. Profiles of Electronic Government Procurement Systems. They were prepared in 2003 by the Government Best Practices Unit in the Department of Development Programs of the Inter-American Agency for Cooperation and Development (IACD, http://iacd.oas.org), with the cooperation of member states of the Organization of American States (OAS).

To discuss problems of National E-Commerce System (NECS) architecture and development the metamodel of E-Commerce System was proposed, consisting of:

- Niche for "National e-commerce system model"
- E-commerce system institutionalization model
- E-commerce system functional model

- E-commerce system technical model

Niche for “National e-commerce system model” is filled with the specific for the economy National e-commerce system model, based on e-commerce system institutionalization, functional, and technical models. Russian NECS model is proposed by Russian Information Technology Association (RITA).

Usage of these models is supported by NECS high level development toolkit (table 1) and NECS deployment program (fig. 1).

Table 1. NECS high-level development toolkit concise tree structure

Tools	Short description
1. E-commerce functioning model	At large covers following functional layers (facilities): disclosure, user support, transaction, system integration.
2. Institutionalization model	Re-engineering of business processes in business sector and institutionalization of different NECS stakeholders: Redesigned work flows, Uniform data schemes, Functioning NECS market
3. Program for NECS creation	Planning, phased realization and maintenance. Major program stages: 1) System architecture development, 2) Program planning and budgeting, 3) System design, deployment and activation, 4) System maintenance
4. Program Parallel tracks	Program parallel tracks for program execution and resources planning
4.1. Program governance documents	Guidelines Legal, regulatory framework Infoware IS creation methodology, ICT standards applicable to E-commerce
4.2. Human capital	Education in e-commerce
4.3. ICT technologies	Telecom infrastructure and access

Tools	Short description
	Trust and security Payment systems Information resources Back office systems and supply chain integration

From the technical point of view NECS could be realized step-by-step in the presence of scares resources from paper to fully electronic system, so following stages could be defined in the NECS lifecycle:

- The first stage may be started as an E-commerce announcement system based on Internet. Such system is not very complex technologically and requires minimum or no legislative change.

- In a second stage some of the transaction flows involved in E-commerce are converted from paper to electronic processing. Conservatively, these flows should be those with lower legal risk such as the online registration of suppliers and the online distribution of bidding documents to potential bidders.

- A third stage involves conversion to full electronic processing and requires substantially more complex technology, operating, and legal/regulatory infrastructure.

- A fourth stage, in addition to full electronic processing of procurement transactions, adds to e-tendering systems highly developed support and oversight systems.

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Fig. 1. Building blocks of the NECS deployment program

In 2001 Secretariat of ASEAN[1] published "Reference framework for electronic commerce legal infrastructure"[2]. Main findings from this reference model are structured and presented in table 2.

Table 2. Main findings in e-commerce laws.

Main area of E-commerce Laws	**Main findings**
General Principles of E-commerce Laws	E-commerce Laws should be: ▪ Interoperable (conform to international standards: UNCITRAL Model Law on E-Commerce and E-Signature, UN Convention of the use of electronic communications in international contracts) ▪ Transparent and predictable ▪ Technology neutral ▪ Media neutral
Scope and Legal Effects	▪ Legal recognition of electronic record (data message/electronic communications) ▪ Legal effects as writing ▪ Legal effects as original record ▪ Legal effects of electronic signature -> Enough to establish legal effects of electronic records? -> Difficulties in law enforcement?

[1] http://www.aseansec.org/ , ASEAN members (Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei Darussal, Vietnam , Laos, Myanmar , and Cambodia) are mostly APEC members.

[2] E-ASEAN REFERENCE FRAMEWORK FOR ELECTRONIC COMMERCE LEGAL INFRASTRUCTURE -- ASEAN SECRETARIAT, 2001 – 19 p.

Provisions of EC Laws	Electronic transactions: ▪ Locations of parties ▪ Time and place of electronic record dispatch/receipt ▪ Factors that constitute an offer/acceptance/other statements associated with the formation of electronic contract ▪ Distinction between offer and invitation to make offer ▪ Use of automated system for contract formation ▪ Errors in electronic communications/transactions
	Electronic records/communications: Legal recognition ▪ Legal effect as writing ▪ Legal effect as original records ▪ Legal effect of electronic signature (what constitute a reliable electronic signature?) ▪ Trusted third parties/Certification Authorities: should be stipulated in E-commerce laws?

So, based on the research briefed above **Guidence will containe**:

- Model regulatory framework for E-commerce
- Templates of E-commerce toolkit
- Policy suggestion to APEC governments
- NECS models for business communities
- Theoretical approach to building NECS and other
- Usefull things

Who is the Guidance for. The immediate objectives of Guidance are to:

i) form a network of public and private officials interested or involved in national electronic commerce (EC) and paperless trade projects;
ii) develop common understanding on fundamental issues, options, and trends in E-commerce in APEC member-economies;

iii) integrate E-commerce and paperless trade initiatives in APEC member-economies; and
iv) cooperatively tune Guidance to support E-commerce project design efforts by governments and project financing decisions by international organizations in APEC member-economies.

What is the goal of the Guidance? To create an regional APEC community and communities in all member-economies of government officials, international organizations staff, subject experts, and industry people committed to create or improve already existing E-commerce systems transparency, efficiency, and economy through judicious use of worldwide best practice.

What is the Guidence to achieve? In general to help people in member-economies responsible for building up theiers NECSes to do this smoothly, efficient and effective using toolkit based on global bestpractice.

How to deliver the intended result? The roadmap for this:

1. Develop the Guidance, as now we have only draft blueprint for it or terms of reference (special new 2007 APEC project or prolongation of the current 2006 project)
2. Include in to the toolkit development team representatives of all e-commerce and paperless trade initiatives in APEC as seen from "2006 Stocktake of Electronic Commerce Activities in APEC"
3. Realise a pilot project of NECS build up in one of the APEC economies, using Guidance
4. Update the toolkit on the results of the pilot project and deliver it to all APEC economies

Where we are now in the development of APEC E-commerce Guidence? We are now only on the first stage – development of terms of reference for Guidence – this final report.

* * *

To realize this project Russian Information Technology Associations has formed work group of following persons:

Family name, name	Organisation	Phone	E-mail
Didenko Pavel	Russian Information Technology Association	+7(495)617-6155	didenko@ritarussia.ru
Drozhzhinov Vladimir	E-government competence center	+7(495) 734 3374	vladdroz@yandex.ru

Makarycheva Natalia	Russian Information Technology Association	+7(495)797-8990 ext. 215	Makarycheva53@mail.ru
Minin Victor	Association for information security	+7(495)156-7102 +7(495)782-3357	mvv@azi.ru
Miyasnikov Alexander	Parus Corporation	+7(495)797-8992	Miasniakov@parus.ru
Pakholkova Natalia	Parus Corporation	+7(495)797-8990 ext. 215	nvpakholkova@yandex.ru
Sabanov Alexey	Aladdin Security Solutions	+7(495)231-3113	asabanov@aladdin.ru
Shipilova Irina	Russian Information Technology Association	+7(926)248-6451	shipilova@ritarussia.ru
Subbotin Sergey	Parus Corporation	+7(495)797-8990	subbotin@parus.ru
Yazvina Irina	Russian Information Technology Association	+7(495) 625 1388	yazvina@rambler.ru
Zadirako Irina	Russian Federation Ministry for Economic Development and trade	+7(495) 625 1388	Zadirako@rosinf.ru

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Natalia Makarycheva, project manager

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Introduction

Below project's objectives, presets and methods will be explained.

Project Objectives

The following table 3 indicates **Project's Objectives and Deliverables**:

Table 3. Project's objectives and deliverables.

Project objective	Current status	End-of-project deliverables
Comparative analysis of governmental procurement systems and e-commerce markets in APEC economies.	Such analysis was not performed yet at multi-national level.	Report on comparative analysys.
Development of concepts of possible e-commerce systems for APEC economies.	N/A	Concept of "APEC Guidance for Electronic Commerce"
Development of guidance for creating e-commerce system for APEC economies based on good practices.		
Conference with following approval of approaches for developing "APEC Guidance for Electronic Commerce"	N/A	Presentation of Concept with following approval of "APEC Guidance for Electronic Commerce".

After the Conference the final report will be presented to ECSG[3] members for review and approval.

Beneficiaries of the project are:

- Business, especially small and medium sized;
- Governmental regulating authorities;

[3]ECSG– APEC E-Commerce Steering Group, http://www.apec.org/apec/apec_groups/som_special_task_groups/electronic_commerce.html

- Public sector.

The development of guidance concepts and methodologies of creating NECS[4] for governmental and business needs in APEC economies will allow to achieve the results, that:

- Business, especially small and medium sized, will be given additional or modified features of e-commerce (such as security issues or transparency principles) that will include enhance a level playing field of access to the governmental procurement systems and form united economic space in the sphere of e-commerce.
- Governmental regulating authorities will be able to enhance tax control. Organisations responsible for governmental procurement system will receive possibility to easily integrate national e-procurement and e-commerce systems as well as connect to international e-markets.
- Development of "APEC Guidance for Electronic Commerce" based on best practice of e-procurement is an important component of e-government.

Generally, the development of guidance and methodologies of creating e-commerce for governmental and business needs in APEC economies will allow achieving the results, that:

- Will reduce the risks in creating similar systems, taking into account regional specifics.
- Will assist in simplifying the conditions for integration of APEC economies into current international system of e-commerce at the earliest stage.
- Will help highlight the potential to reduce costs by implementation of e-commerce systems for governmental needs in APEC economies.

The Project aims to assist APEC Member Economies to meet the free trade and investment liberalization goals. The project objectives relate with following statements made in Section C, Part ONE of Osaka Action Agenda (OAA) (table 4)

[4] NECS – National Electronic Commerce System

Table 4. The project objectives relation with some statement made in Section C, part ONE of Osaka Action Agenda.

Section, Issue, OAA Statement	Project contribution
3. SERVICES	
OBJECTIVE	
a. progressively reducing restrictions on market access for trade in services	Transparency principles to be studied aim to exactly reduce restrictions on market access.
c. providing, in regulated sectors, for the fair and transparent development, adoption and application of regulations and regulatory procedures for trade in services	Expected project results will support APEC economies' officials with guidance on how to incarnate transparency principles in regulatory procedures.
TELECOMMUNICATIONS	
a. work to bridge the digital divide at the domestic, regional and global levels, and to cooperate and collaborate with the business/private sector in this effort	The Project after going actions could be aimed to provide cooperation between national e-commerce systems among APEC economies.
b. foster discussion between business/private sector and governments on appropriate means to assess and reward the value of products and services exchanged in the provision of converged Internet services among APEC economies…	The present Project is to develop of "APEC Guidance for Electronic Commerce" which aims to clarify approaches could be used to access and reward the value of products and services exchanged in e-commerce system which for theirs parts mostly are based on Internet.
e. work to ensure that policy and regulatory environments better foster the uptake of e-commerce	The research of current policy and regulatory environments and extracting the best practices from theirs is a part of such work.
g. give attention to user requirements for open standards and systems to support interoperability	As mentioned above, one of the Project targets is to provide guidance on cooperation. End-user requirements will be studied and included as a part of research.
5. STANDARDS AND CONFORMANCE	
OBJECTIVE	
a. align their domestic standards with international standards	The present Project aims to provide APEC economies with guidance to improve their domestic standards in e-commerce area.
ALIGNMENT WITH INTERNATIONAL STANDARDS	

c. continue to investigate means of enhancing regulatory practices in the APEC region through a program of case studies and seminars	One of the proposed project tasks is to provide a conference with discussion also on this subject.

The Project supports implementation of the following General Principles prescribed in the Osaka Action Agenda:

- **Non-discrimination** - reductions in barriers to trade achieved through APEC are available to all APEC Member Economies as well as to non-APEC economies.
- T**ransparency** - the laws, regulations and administrative procedures in all APEC Member Economies which affect the flow of goods, services and capital among APEC Member Economies are transparent.
- **Flexibility** - APEC Member Economies deal with the liberalization and facilitation process in a flexible manner, taking into account differing levels of economic development.
- **Cooperation** - Economic and technical cooperation contributing to liberalization and facilitation is actively pursued.

All these principles are mostly implemented in e-Procurement systems and project objective is to discover best practices of such implementation and to offer them (practices) as guidance of e-Commerce.

Project presets

National Electronic Commerce System

This project framework bases on following postulates:

- APEC economies governments are interested in National Electronic Commerce development as well as for transborder operations;
- The appropriate way is to engage business community and non-government organization or civil society organization in development of National Electronic Commerce institutions;
- As sequent to aforesaid – Some functions passing from government to non-government organization or civil society organization should be encouraged.

In accordance with 1998 APEC Leaders' Declaration, APEC Blueprint for action on Electronic Commerce governments should define the directives but abstain from play. The main role in development of Nation Electronic Commerce as well as in creating the appropriate infrastructure should be leaded by business.

In present research and analysis we will focus exactly at government's role and objectives keeping the distance from business role and activities in this field.

Government role in NECS deployment

Electronic Commerce is an economic activity that will expand under market forces if it finds an even minimally enabling environment. Governments create the enabling environment through major policy decisions that directly affect the pace of adoption, economic scope, and distributional quality of Electronic Commerce. For these reasons governments worldwide are explicitly formulating strategic vision and policy for Electronic Commerce Structure of the NECS Market.

Under NECS many of the source selection, transaction processing, pricing, contracting, and payment functions previously done by companies procurement staff are carried out by institutional service intermediaries generally called NECS marketplaces. These will be necessary in all cases to ensure consistency and predictability of all aspects of the business procurement transaction (management, process, payment, technology, legal and regulatory compliance). Deciding on the structure, ownership, and operation of NECS marketplaces is therefore a key policy decision to be made by government. The services of an NECS marketplace may be provided by Government itself (for government procurement) or by the private sector, and differently for different sectors of the economy.

The options range from local public monopolistic provision of NECS services, to international private competitive provision of the same. Actual decision depends on many factors of which the most salient are four fundamental choices, not mutually exclusive:

1) Public vs. Private operation;

2) National vs. International scale;

3) Monopolistic vs. Competitive structure;

4) General purpose vs. Specialized scope.

Since work must proceed gradually and major changes precede final success, it is important for government to articulate vision and goals for the NECS program and thereby focus expectations, resources, decisions, and program monitoring for the duration of the program (typically 5 years or more). In defining vision and goals, Governments typically involve all the key sectors and program agencies. It is important to ensure some proportionality between the level of stakeholder commitment and the reach of an NECS Program. Indeed, staff mistrusts and resistance has been one of the key reasons for slow progress of NECS Programs in several countries

As a part of research we developed the questionnaire for APEC economies to collect data and organize the collective NECS profile in APEC region which could be a base for definition of national aspect of NECS development in different economies.

As open information in this field is insufficient and only few economies replied to the questionnaire we understood that present research and analysis is quite important. We presume that the results of our research and analysis will help APEC economies governments and officials properly setup (or correct) their authority in the field of development of National Electronic Commerce System.

Brief glossary of major terms

The full glossary see in annex.

Electronic Commerce (e-commerce, EC) – the way to organize the business when workflow (information flow, document flow, etc.) incarnated in the form of data messages.

Electronic Commerce development toolkit -- consists of guidelines, concepts, standards, methodologies for each stage and phase of e-commerce system and NECS life cycle. The root of the toolkit is **Strategy, vision and objectives** document approved by government. It provides high level government officials with a whole picture of the importance of understanding the need for government leadership, vision and change management, in developing a sound and comprehensive NECS solution. It points out the major topics and objectives to be taken into account when creating such strategy and serves as the main introduction for the rest of the toolkit.

Infoware -- the following data sets, at a minimum, need to be normalized and rigorously used for all new EC transactions processed by the EC system and for historical transactions, if not all possible: 1) product/service identifiers and descriptors; 2) unit identifiers and descriptors; 3) program identifiers; 4) stakeholder (purchaser, supplier, marketplace, service provider) identifiers;

and 5) EC transaction identifiers. Lists containing all these identifiers should be available system-wide and their use needs to be made mandatory after suitable training and testing. Creation, use, disclosure, and retirement policies should be associated with each set of identifiers and reflected retroactively over historical data to the extent possible. One of the standards to be considered is The United Nations Standard Products and Services Code® (UNSPSC®, http://www.unspsc.org). This is an open classification system managed by the Electronic Commerce Code Management Association (http://eccma.org/). It is expanding rapidly both in content (over 11,000 commodities/service categories) and number of adherents. It has been translated into eight languages. A browser is available at http://eccma.org/unspsc/browse/. A search tool is available at : http://www.gs1us.org/gs1us.html .

Legal, regulatory framework -- in general, the legal reform agenda encompasses legislation and regulation on electronic commerce, electronic payments and electronic public procurement. Thus, in developing countries where EC is not yet highly developed, NECS may well become (including by explicit policy choice) the driver of legal and administrative reforms needed for the larger purpose of adjusting to the global, networked economy. Standards are needed in diverse areas for proper NECS market operation and care should be exercised to coordinate with the private sector favoring whenever possible market over custom government standards

National Electronic Commerce System (NECS) – the aggregate of objects and subjects of Electronic Commerce. These objects and subjects interact during the business process and are framed by National jus.

NECS Development Public Policy – the constituent part of public economical and scientific and technical policy, containing the aggregate of governmental measures directed to promote NECS.

NECS Infrastructure - the aggregate of objects and subjects promotional to Electronic Commerce.

Oversight systems and functions --the large scope, high level of risk, and technology intensity of NECS requires specialized steering and oversight organizations. Whether existing organizations adopt the new responsibilities or new adjunct organizations are created, they must fairly balance the interests of the various stakeholders in the NECS market (buyers, sellers, marketplace operators, service providers) and promote cooperation among them to gain rapid adoption of technology and operating standards. Ideally, key members of these organizations

remain in their roles throughout the planning, implementation, and operation phases of the NECS Program. The main functions of an effective complement of steering and oversight organizations and mechanisms are: 1) coordinate adoption of technology standards; 2) provide strategic advice on NECS program design and contract management; 3) establish operational standards for the NECS marketplace; 4) coordinate the re-engineering of commercial and public procurement processes and the adoption of uniform identification schemes; 5) advice business and first of all SME on human resource education, training, and incentive systems; 6) administer certification schemes for EC installations; 7) operate the NECS oversight system; 8) audit NECS market operations; 9) monitor outcomes of the NECS Program.

Supportive, well-trained human resources -- whether business operates itself, outsources, or merely supervises the operations of EC marketplaces, it has to develop the knowledge and capabilities necessary to establish performance and quality standards, negotiate and manage outsourcing contracts, and assess compliance on an ongoing basis. Under NECS, monitoring of legal and regulatory compliance must be done at a higher level of sophistication, efficiency, and skill than under manual systems for two main reasons: first, much of the transaction processing burden is taken over by the electronic marketplaces; second, powerful market research, process tracking, and performance analysis technology is available.

Project action plan

Tasks to be performed (Jan 15, 2006 – Dec 15, 2006) in the framework of the project:

1. Determination of the project's scope
    - Setup main project targets and tasks;
    - Define project limits (including selection of 3 economics to be studied).
2. Forming Research Group. This group will have to prepare the following materials:
    - Full set of present and forthcoming legal documents (including industrial, regional and departmental documentation) dealing with spheres of governmental procurement and e-commerce;
    - Note on the procedure of document acceptance that form the above mentioned legal base;

- Detailed statistical overview of governmental procurement and e-commerce as well as official prognoses of development of these markets (if available);
- Purpose state programmes, aimed at realisation of abovementioned and related to it (if available);
- Overview of governmental procurement practices and development of e-commerce markets;
- Detailed analysis of GBĎ "Private Sector Recommendation to Government on Realization of e-Government" AWD, ICC instruments of 14.9.01 as the base for the development of "Private Sector Recommendation to Government on Realization of e-Procurement";
- Technological overview of present condition of automation of governmental procurement and e-commerce, specifically: list of companies, present in IT market, list of users, list of platforms used and decree of its localisation (linguistic and legal);
- List of potential technological partners in this activity. Establishing primary contacts with them. Signing Letters of Intention.

3. Approval of work list with expert community in each of the economies that would provide for discussion on each sub-stage of the work while documenting the opinions of all experts.
4. Based the reports received, the most common traits in the governmental procurement systems are outlined, conclusion regarding potential of best practice.
5. Forming a vision, that e-commerce system to correspond.
6. Developing chain of events that would lead to result taking national specific into account.
7. Final preparation of the concept and methods of creation and functioning of e-commerce for governmental and business needs.

Upon completion of these works the Final Report is to be prepared, presentation of the results is to be made at the Conference.

APEC e-commerce strategy, vision and objectives

APEC e-Commerce strategy is part of the e-APEC strategy which grew out of the 2000 Action Agenda for the New Economy to provide a blueprint, coordination and stepping stones for APEC ICT activities in a forward-looking, long term, action-oriented plan. The e-APEC Strategy calls for economies and APEC fora to: create an environment for strengthening market structures and institutions; facilitate an environment for infrastructure investment and technology development; and enhance human capacity building and promote entrepreneurship. Multiple APEC fora have been successfully engaged in achieving these goals and the ongoing implementation and success of the e-APEC Strategy continues to be monitored.

Concrete implementation of the e-APEC strategy took off in 2002. APEC Leaders endorsed the APEC Digital Divide Blueprint for Action, agreeing on six attributes of successful policies to bridge the digital divide:

- **Leadership** – often at economy level but also including local and regional initiatives to create a vision and institutions/structures to address the issues.

- **Partnerships** – including business, education and social institutions, and government.

- **Policy Coherence** – to ensure that all policies are working together to create the desired economic and social environment.

- **Market Focus** – among others, to develop demand that can justify investment required.

- **Sustainability** – to ensure continuation of the services beyond the seed money stage.

- **Scalability** – to ensure that a program or an initiative can be replicated throughout under-served areas.

APEC continues to closely monitor ICT access penetration levels in the region in hopes of accomplishing its universal access goals by 2010. Work continues in APEC on pilot projects, and a renewed emphasis on the use of next-generation technologies (such as broadband, wireless infrastructure, IP v6 protocols, etc.) and their resulting policy implications, to help achieve Information Society goals.

Building blocks of e-APEC's strategy[5] are Cybersecurity, Electronic Commerce, Trade Facilitation, Trade in the Digital Economy, Paperless Trading, Education and Social Initiatives.

Cybersecurity. The APEC Leaders' Declaration on Fighting Terrorism and Promoting Growth included specific commitments on promoting cyber security that included commitments to:

- Endeavor to enact a comprehensive set of laws relating to cybersecurity and cybercrime that are consistent with provisions of international legal instruments, including United Nations General Assembly Resolution 55/63 (2000) and Convention on cybercrime (2002), by 2003;

- Identify national cybercrime units and international high-technology assistance points of contact and create such capabilities to the extent they do not already exist, by October 2003.

- Establish institutions that exchange threat and vulnerability assessment (such as Computer Emergency Response Teams) by October 2003. Drawing on APEC's strengths in capacity building and technical assistance, a number of workshops and seminars are being held to enable economies to meet these commitments.

Electronic Commerce. Highlighting the importance of electronic commerce to APEC's overall trade and investment liberalization, Ministers adopted the Blueprint for Action on Electronic Commerce in 1998. It called for the creation of the Electronic Commerce Steering Group (ECSG), in order to ensure continued coordination and pursuit of the Blueprint. Its objectives are to work together to:

- build trust and confidence

- enhance government use

- intensify community outreach

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[5]APEC Regional Information Society : A Contribution to the World Summit on the Information Society -- Senior Officials' Meeting II Khon Kaen, Thailand 29-30 May 2003. Document WSIS/PC-3/CONTR/137-E 13 June 2003 Original: English -- 19 p.

- promote technical cooperation and experience exchange
- where appropriate, work towards eliminating impediments to its uptake
- develop seamless legal, technical, operating and trading environments to facilitate the growth and development of electronic commerce

APEC is building consumer trust in e-commerce by helping to protect consumers from fraudulent and deceptive practices when buying goods and services online. Last year APEC Ministers endorsed the Voluntary Consumer Protection Guidelines for the Online Environment and their accompanying report, which can be found at www.export.gov/apececommerce/consumer_protection.html. These cover international cooperation, education and awareness, private sector leadership, on-line advertising and marketing, and the resolution of consumer disputes.

The challenge for economies in addressing the issue of data privacy is protecting the personal information of consumers while also preventing the interruption of trans-border data flows. In order to foster the development of compatible approaches to data privacy in the region, APEC began a work agenda on data privacy in 2002. This work plan includes completion of a mapping exercise of APEC economies' approaches to data privacy-- with an accompanying report, development of APEC privacy principles and implementation mechanisms; and the continued exchange of information on developments related to data privacy within individual economies. To manage this work, APEC has established a Data Privacy Subgroup (for more information go to www.export.gov/apececommerce/privacy.html).

Trade Facilitation. Trade Facilitation is one of APEC's three main pillars of work to achieve the Bogor Goals of free and open trade and investment. As part of the Shanghai Accord, endorsed by Leaders in 2001, APEC Members agreed to significantly reduce transaction costs by five percent across the APEC region over the next five years. In 2002, Leaders and Ministers adopted the Trade Facilitation Action Plan, a framework for achieving the objectives of the Shanghai Accord. The Action Plan envisions APEC members implementing specific trade facilitating reforms, and estimating cost-savings that business will derive from their implementation. One of the four main categories for the reforms is electronic commerce, and includes measures related to authentication, cybersecurity, and the development of a portal of information on the legal, regulatory, and policy practices related to these issues in the APEC region.

Trade in the Digital Economy. Reflecting APEC's ongoing commitment to advancing and strengthening the information society, sixteen economies adopted the Leaders Statement to Implement APEC Policies on Trade and the Digital Economy in 2002. The Statement integrates requirements on services, intellectual property and tariffs into one agreement to promote trade in the digital economy in a cross-cutting way. The agreement will be used to set trade policy targets in new areas important for ensuring the free flow of trade and investment in the digital economy and to strengthen e-commerce.

The general objectives of the Initiative entail liberalization and open trade policies leading to:

- greater development of e-commerce and economic growth
- promotion of market access and trade across sectors using electronic networks
- domestic regulation designed to be least restrictive to trade
- a long-term moratorium on customs duties on electronic transmissions
- support of demand-driven capacity building projects to ensure all economies benefit from the growth of the digital economy

Although not all APEC economies have agreed to the initiative, the sixteen signing economies are able to progress towards the goals of the Statement which may include, on a voluntary basis, the participation of the five non-signing economies.

Paperless Trading. Paperless trade is overlap of e-commerce, e-government and international trade. In 1998, APEC economies committed to reduce or eliminate the requirement for paper documents needed for customs and other cross-border trade administration, where possible, by 2005 for developed and 2010 for developing economies (http://www.apec-iap.org/). APEC economies are working with business to facilitate paperless trading for cross-border transactions. Initiatives being introduced include:

- Electronic customs clearance systems
- Electronic cargo and port manifests
- Electronic carnets to facilitate the movement of samples for trade displays

- Electronic certificates of origin; and

- Electronic Sanitary and Phytosanitary (SPS) Certification.

Education and Social Initiatives. APEC has also recognized the importance of developing human capacity and of harnessing information technologies for the future. These themes have led APEC to undertake activities in several fora to address education and the application of information technologies in social services including health services.

So, APEC e-commerce agenda continues to focus on data privacy, consumer protection, cybersecurity, paperless trading, trade facilitation and SME e-commerce development.

NECS metamodel

Early potential gains, high innovation value, and synergy with broader information infrastructure initiatives should not mislead anyone into thinking that NECS is just a short, high-intensity, high-technology effort. On the contrary, and this is why it is called a **"program"** rather than a "project", National e-commerce system deployment program is a long-term, fundamental change process of governance, human resources, institutions, and technology. Only through sustained effort along these four parallel implementation tracks using NECS high level **development tool kit** will potential benefits fully materialize.

When we examine a complex system, it is a good idea to break it up into a number of parts where each part has a specific function to perform. e-Commerce systems, as many others, may also be thought of as consisting of some layers, each layer providing a service. Each layer has a specific function and can be described separately. The lower layers support the upper ones. This provides us with a logical means of discussing the architecture and functionality of e-commerce systems.

In the same way we can built some systems **models** each featuring specific aspect of the system for development and arrange the models according to level of theirs abstraction as is shown in the following table 5 to make **metamodel** of the NECS. Metamodel is an ontology to discuss problems, not an architecture.

Table 5. Metamodel of the NECS.

Tools	Models of-commerce system	Sources	Execution
NECS high level development toolkit	***Niche for "National e-commerce system model"***	APEC's economy (NECS example for Russia)	**NECS deployment program**
	E-commerce system institutionalization model	World Bank 's **Error! Reference source not found.** "Electronic government procurement"	
	E-commerce system functional model	World Bank's **Error! Reference source not found.** "Electronic government procurement	
	E-commerce system technical model	V. RAJARAMAN.	

E-commerce system technical model

One possible layered model is given in table 6[6]. Here are used six layers to logically discuss e-commerce systems. Each layer has a function and supports the layers above it. The bottom-most layer is the physical layer. It hides the physical infrastructure such as cables, wires, satellites, mobile phone system etc. Their common function is that they provide the communication infrastructure for e-commerce. In fact, without high speed, reliable electronic communication, e-commerce is not possible. The emergence of wireless communications has enabled one to use

[6] V. RAJARAMAN. Building blocks of e-commerce. -- www.ias.ac.in/sadhana/Pdf2005AprJun/Pe1295.pdf

mobile hand-held computers which is turn has resulted in the emergence of mobile commerce, abbreviated to m-commerce.

Table 6. A layered technical model of e-commerce system.

Model by V. RAJARAMAN		**Model by RITA**
Layer's name	**Layer's content**	**Layer's name**
Application layer	C2B e-commerce	Information resources (e-trade web sites of different size, logistic chains, paperless trade, taxonomies of goods and services)
	B2B e-commerce	
	G2B e-commerce	
	C2C e-commerce	
	G2C e-commerce	
Middleman services layer	Value-added networks	E-payment systems
	Digital signature certifying authority	
	Electronic payment schemes	
	Electronic cash	
	Hosting services	
Messaging layer	Digital encryption standard	Trust and security
	Advanced encryption standard	
	Public key encryption	
	Digital signature	
	Electronic data interchange	

Model by V. RAJARAMAN		Model by RITA
Layer's name	**Layer's content**	**Layer's name**
Network services layer	E-mail	Telecommunications infrastructure and access
	World wide web services: browsers	
	Hyper-text transfer protocol: http	
	Hypertext markup language: html	
	Extensible markup language: XML	
	Search engines	
	Software agents	
Logical layer	Internet	
	Intranet	
	Extranet	
	Firewalls	
Physical layer	Local area networks	
	Public switched telephone networks	
	Private communication networks	
	Optical fiber and coaxial cable networks	
	Routers	
	Satellite-based networks	
	Cellular networks	

Model by V. RAJARAMAN		Model by RITA
Layer's name	**Layer's content**	**Layer's name**
	Wireless networks	

The next layer is called the **logical layer**, as it defines protocols (i.e. a set of mutually agreed rules) to communicate logically between computers connected by the physical network. Internet is a world-wide network of computers that communicate with one another using a particular protocol known as TCP/IP (Transmission Control Protocol / Internet Protocol). The world wide acceptance of this standard has led to the emergence of the internet as the essential infrastructure for e-commerce. The simplicity of connecting computers from diverse manufacturers using TCP/IP protocol led to the explosive growth of the internet and its wide acceptance. Organizations found it attractive to use the same protocol, namely, TCP/IP to interconnect computers within their organization.

The next higher layer is the **network services layer**. This provides services on the internet infrastructure. The most important service originally was the e-mail service. Currently, the most important service is the world wide web service which provides users convenient access to information stored in computers anywhere in the world. Other services which make e-commerce possible are: html (hyper text markup language), XML (extensible markup language), browsers and search engines.

Among the most important requirements of e-commerce is exchanging messages and documents between participants in e-commerce. For example, purchase orders, delivery notes etc., have to be sent electronically. The cheapest means of doing it is using the internet. In C2B and C2C e-commerce, internet is the only available system. As was pointed out earlier, the internet being accessible to everyone there is always the danger of messages and documents being maliciously altered by unscrupulous persons. Thus, there is a need to send messages which are coded using a

secret code. It is also necessary to have an equivalent of signing in the electronic medium. These requirements namely encrypting messages to ensure security and digital signature to authenticate communications received electronically are provided by the **messaging layer**.

The next layer is called **"middleman services"**. They are essentially services provided to e-commerce participants to make their dealings easier. Some important middleman services are secure payments using credit cards, imitating cash payments for small purchases and authentication of digital signatures. Value-added networks provide secure electronic transactions among participants. Hosting services provide among other facilities, web presence for organizations and electronic catalogues and directories etc., to participants.

All the services provided by the layers described above are essential to support e-commerce application, namely, C2B, B2B, G2B e-commerce, C2C, G2C, C2B, B2B and C2C. This is thus the top **application layer** in the layered architecture.

E-commerce system functional model

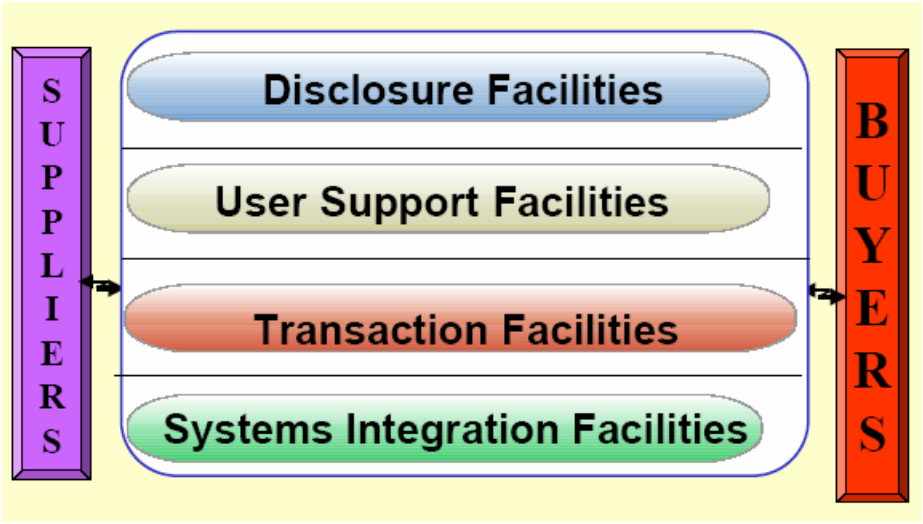

Fig. 2. Functional components of an e-Commerce System's trade site

A fully developed E-commerce system has three broad components as shown on fig. 2:

1. **Disclosure and User Support facilities**. It consists basically of a World Wide Web-based facility dedicated to the full disclosure of all public procurement opportunities and contract awards. As a minimum this facility should allow: 1) public query, in various classifications, of outstanding procurement transactions, their purpose and

timetable, and the associated bidding documents, 2) public consultation of a complete database of public procurement awards and complaints, in multiple classifications, and their associated documentation (except for the actual bids, which are confidential), 3) production of statistical reports from the above database.

2. **Transaction Facilities:**

   - **Electronic Tendering Component.** E-Tendering systems support carefully regulated competitive bidding processes based on detailed bidding documents (BD) and technical specifications (TS). E-Tendering systems are particularly suitable for procurement of large public works, of production capabilities such as a power plants, of performance capabilities such as large information systems, or of sophisticated services such as design and management of virtual private communication networks. All these are documentation-heavy procurement transactions that require careful evaluation of quality aspects, customized contracts, and extensive services. They encompass diverse packages of goods and services (for delivery, installation, testing, integration or maintenance of goods supplied).
   - **Electronic Purchasing Systems.** E-Purchasing systems are primarily oriented towards discrete item or lot purchasing of off-the-shelf products and/or precisely defined services. Their distinguishing characteristics are: 1) they involve an electronic, legal equivalent of a physical marketplace where goods are figuratively displayed (electronic catalog) and buyers and sellers meet under rules of procedure enforced by the marketplace operator; 2) they provide comparison facilities and electronic pricing mechanisms, but not contract formation facilities as terms and conditions of contracts are pre-established; 3) they involve full, legally binding electronic contracts subject at most to offline confirmation, but not to off-line decision processes. There are two broad modalities of e-purchasing systems distinguished by their price setting mechanism as follows: in the e-shopping modality, selling prices are fixed and known and in the e-auction modality, prices are determined through an electronic bidding process either among several buyers (e-bidding) or among several suppliers (e-reverse bidding).

3. **Systems Integration Facilities.** They interconnect front and back offices of the e-commerce business and the users of the e-commerce business – services and goods suppliers and buyers, also they help build logistic chains.

Institutionalization models

Institutionalize, according to Merriam-Webster On-line, means to make into an institution : give character of an institution to <institutionalized housing>; especially : to incorporate into a structured and often highly formalized system <institutionalized values>.

Introduction of the NECS in a country leads to reengineering of business processes in business sector and institutionalization of different NECS stakeholders. A lot of work should be done to get:

- **Redesigned Work Flows.** . Use of electronic methods implies that many of the process steps formerly carried out by business procurement officers are now carried out by e-marketplaces, particularly with respect to tendering transactions. This requires redesigning, documenting, and testing a whole new set of public procurement procedures. Depending on the implementation timetable for integration between the new NECS systems and the back office systems of government, the procedures may undergo several iterations during the transition period, first to revamp manual procedures and then to substitute gradually for the ones appropriate under automated interfaces.
- **Uniform Data Schemes.** Normalization of data is an indispensable prerequisite for operation of the NECS oversight and support subsystems. Without it, program impact indicators will manually be unavailable and it will not be possible to monitor the results of the NECS program for lack of indicator data. Furthermore, productivity gains from examination of past transaction data will not materialize since such examination is too cumbersome without uniform identifiers.
- **Functioning NECS market.** To have a functioning NECS market government needs to implement a policy on market structure. This in turn requires a policy on roles and responsibilities and strategies for phased implementation and investment financing. Deciding on these policies and strategies is therefore a key planning step which must precede attempts to put in place the building blocks of an NECS program.

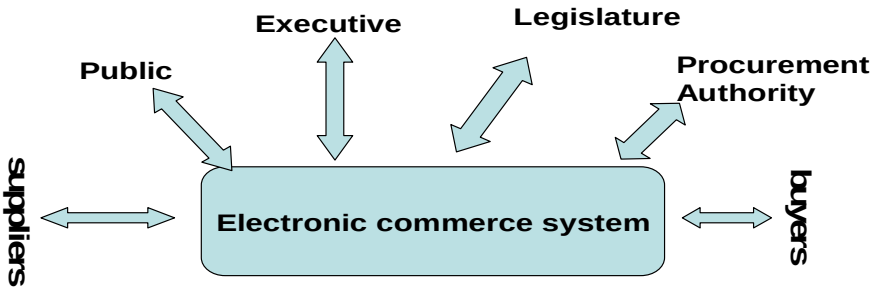

Fig. 3. NECS stakeholders

National e-commerce system

Above the concept of National Electronic Commerce System was introduced. Each APEC economy can build its own NECS model using notions from technical, functional and institutionalization models (see table 5).

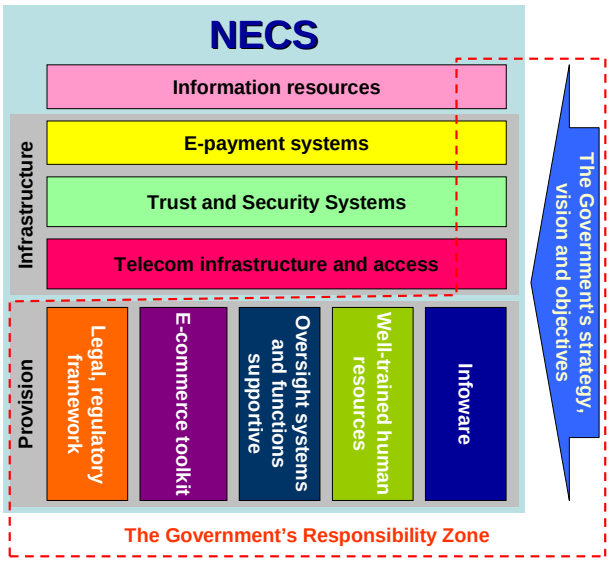

Fig. 4. Russian model of NECS.

Russian NECS model was developed (see fig. 4 above) by Russian IT Association (RITA, http://www.ritarussia.com) on the base of technical, functional and institutional models of e-commerce system for use in Russia. It is the set of following components:

- Assembly of NECS e-commerce systems, which are information resources or e-trade places.
- NECS infrastructure including:
    - E-payment systems;
    - Trust and security systems;
    - Telecom infrastructure and access.
- Set of facilities enabling NECS design, development and functioning (supportware or provisions) which include:
    - E-commerce legal and regulatory framework (laws, regulations, standards and technical reglaments)
    - E-commerce toolkit consists of guidelines, concepts, standards, methodologies for each stage and phase of e-commerce system and NECS life cycle. It includes also some governance documents – E-commerce strategy, vision and objectives template, which is the frame for each APEC member-economy and APECS as a whole to develop their own E-commerce strategy, vision and objectives.
    - Supportive, well-trained e-commerce systems human resources
    - E-commerce infoware (glossaries, handbooks, taxonomies, codes, information on tenders, registers of unfaire suppliers, e.a.)

The NECS supportware components listed above are subjects of this research and recommendations:

National e-commerce system deployment program

NECS deployment program framework

This effort must put in place four parallel tracks and ten interrelated building blocks (fig. 5)[7].

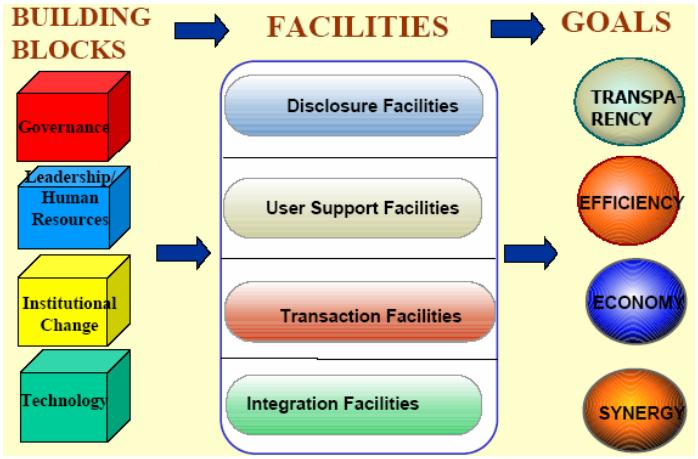

Fig. 5. National e-Commerce System's deployment program concept.

(I) Governance track consists of:

- (1) **Legal and Regulatory Framework.** As above for NECS model.
- (2) **Steering, Oversight Organizations.** As above for NECS model.

(II) Human resources track consists of:

- (3) **Supportive, Well Trained Human.** As above for NECS model.

(III) Institutions track consists of:

- (4) **Redesigned Work Flows**. As above for institutelisation models.
- (5) **Uniform Data Schemes**. As above for institutelisation models.
- (6) **Functioning NECS market**. As above for institutelisation models.

(IY) Technology track consists of:

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[7] http://wbln0018.worldbank.org/OCS/egovforum.nsf/main/home

- (7) **Telecommunications Infrastructure**. As above in layered technical model of e-commerce systems. Infrastructure in general and telecommunications infrastructure in particular are obviously serious constraints to the spread of NECS. If transport infrastructure is poor, deliveries will take too long and interest in NECS will decrease. In Latin America, for example, orders take an average of five days to be delivered (vs. 48 hours in the US) And without adequate telecommunications infrastructure, the cost/service tradeoffs for electronic commerce deteriorate considerably.
- (8) **Access Technology Infrastructure**. As above in layered architecture of e-commerce systems. Businesses need telephone lines and PCs with Internet access to participate in NECS. Ideally, each Purchasing Worker (PW) would have such access at his/her desktop, in which case internal networks connecting the various PW stations within each business would be desirable. However this is by no means indispensable from the start. For tendering transactions, which at the business level are not very numerous, one access point per purchasing business could suffice at the beginning. In the initial stages, furthermore, specialized EC centers for SME that combine access to Internet, training of staff in EC, and technical assistance on specific transactions can be considered as a suitable design alternative. Similarly, the presumption that NECS may discriminate against potential suppliers that have no Internet access (or for whom that access is prohibitively expensive) should be carefully studied before being accepted as an impediment to introduction of NECS. Obviously, if Internet access is simply not available, this is a larger issue of national information infrastructure (NII) that impinges not just on the introduction or NECS but on many other aspects of the economy. NECS alone cannot be relied upon for resolution of this issue, but it can feature prominently in an overall economic argument for telecommunications sector reform. The issue of potential net economic disadvantage for Local, minority and SME Suppliers and micro enterprises as a result of the economy's conversion to e-business goes far beyond NECS and indeed may be one of the most tangible indicators of the so called "digital divide". At the level of an NECS program, however, there are several ways to deal with the issue of cost-based discrimination from electronic systems:

    - The e-tendering facility operator (either the government or a contractor to government in most cases) can provide direct NECS system access at designated facilities, at subsidized, gradually escalating costs (which could

start at zero). Small supplier training and support programs can be offered at the same facilities. The fee structure can be designed to encourage self-graduation upon reaching specified business volume thresholds (data easily obtainable from the NECS system).

- The e-tendering system can be designed to accept off line paper or electronic mail documents, with clear procedures on handling sequence, filing, and reproduction vis-à-vis electronic documents.
- In the case of e-purchasing systems, access infrastructure can facilitate access by small and special suppliers first by adopting open standards for e-catalog content, second by subsidizing directly or indirectly the training and catalog development work of small suppliers, and third, by requiring e-purchasing marketplaces to provide preferential visibility and pricing features to special groups in accordance with the law.

- (9) **NECS Software**. The following key considerations with respect to the acquisition or development of NECS software systems are worth bearing in mind:

  - Businesses rarely have all the skills, processes, tools, financing instruments, and management practices required to develop and maintain industrial-strength software systems.
  - A typical case in many developing country businesses is that of an business with a cadre of highly competent software engineers, hopefully experienced in use of CASE technology, overburdened with ongoing in-house systems work, who nonetheless stand ready and eager to develop the EC system for internal use. Unless this technical team has specific development experience with Internet technology, a tradition and discipline for professional software engineering work, dedicated technical management and staff, and financing sources that transcend the initial development effort, chances are that a better strategy is to contract out the development the EC software system. The same professional standards should be required from in-house software development teams than from private contractors.
  - A sure sign of runaway risk is when in-house teams are exempt from the controls, processes (for testing and documentation, for example), quality standards, and technical audit requirements that would be customary in large software development contracts with a private contractor.

- Adoption of NECS software developed by another public agency in the same or a foreign country must be done only after full consideration, and proper long-term financing, of technical support and maintenance services on a par with a commercial contract. Intellectual property rights and licensing restrictions should be considered with equal or greater formality than in commercial transactions, as well as issues of documentation, training, and risk from key staff rotation at either the sourcing or recipient agencies.
- Adoption of commercial software as part of an outsourcing contract for e-marketplace operation should be preceded by benchmark testing of the software to assure compliance with local laws and regulations and with requirements of the oversight system.

- (10) **Back Office Systems**. Integration of NECS and back office systems such as order tracking, receiving, inventory control, and accounting is the logical next building block of NECS. Without integration of back office systems the potential benefits of NECS remain severely curtailed. Efficiency gains in the domain of the NECS system can even be negated by even larger inefficiencies in manual interfaces with back-office systems.

Phasing the implementation of NECS in such a way as to keep in balance the burden of change with the evolving capacity of the corps of companies procurement officers is a real class act. Options are of course too numerous and country-specific. Perhaps the most important policy dilemma in phasing the implementation of NECS is whether to take the big bang or the gradual approach with respect to the simultaneous introduction of new regulations, new procedures, new systems and new technology. The big bang approach holds that if people are going to be under change-induced stress, they may as well be so for more rather than less change. For example, if a new performance evaluation system for public procurement is being introduced, perhaps the best time to do so is concurrently with the system and technology changes inherent in switching to NECS. A gradual approach would be to design incremental change "packages" (of systems, regulations, procedures, and technology) commensurate with perceived capacity changes induced by the education and training effort. Fortunately, NECS systems lend themselves to phased implementation. For instance the phases of E-Tendering System implementation are:

- A **first stage** may be started, as a public procurement announcement system based on Internet. Such system is not very complex technologically and requires minimum or no legislative change.
- In a **second stage** some of the transaction flows involved in public procurement are converted from paper to electronic processing. Conservatively, these flows should be those with lower legal risk such as the online registration of suppliers and the online distribution of bidding documents to potential bidders.
- A **third stage** involves conversion to full electronic processing and requires substantially more complex technology, operating, and legal/regulatory infrastructure. Under such system all pre-bidding steps are accomplished electronically — notice/solicitation, invitation, registration, purchase of bidding documents, clarifications, modifications to process or substance of the procurement; and access to support information. Furthermore, submission of bids, opening of bids, filing of minutes of the bidding session, recording of the award decision, reception and filing of complaints, and notice of disposition of complaints, are all done electronically. Paper bids may still be acceptable both as a transitional device and to avoid complaints of skill or technology-based discrimination, but lag times are not paper-based any more. Legal, regulatory and operational frameworks specific to public NECS are incrementally required for third-stage e-tendering systems.
- A **fourth stage**, in addition to full electronic processing of procurement transactions, adds to e-tendering systems highly developed support and oversight systems.

Potential country NECS projects, whether or not financed by the Country's State Bank or international development organizations, would need to be very country-specific and consequently include variable combinations of the following broad components: a) NECS strategy formulation and Program design; b) NECS change management and process re-engineering; c) NECS technology infrastructure and systems development; d) formulation of NECS legal and regulatory frameworks; b) establishment of NECS markets through competitively awarded partnerships, concessions, or licenses. Governments need to make an early policy decision on the extent and conditions of private sector financing of e-marketplaces. Since governments are frequently the largest buyers in particular economies, the business case for operation of e-marketplaces will certainly be considered by the private sector. In many countries, the prospect of a monopoly or oligopoly concession on public e-tendering transactions, for example, will be sufficient to generate competition among private sector operators and full investment financing by the winner.

Government and private sector roles in NECS deployment program

Government and private sector roles (table 7) change on different phases (planning -- architectural design, budgeting, scheduling --, implementation, operation) of the program realization. Without active government leadership, public procurement can go on for a long time in splendid isolation from the technological revolution transforming private sector business and trade. Pressures may arise from proliferating e-commerce facilities in the economy, and from public disgust with obvious government waste. Eventually, governments may be forced to reform procurement governance and allow at least marginal adoption of e-commerce practices, but this would occur late, in a piecemeal fashion, and at the cost of huge opportunity losses. Governments in virtually all large economies have recognized this danger and started forceful NECS initiatives. In implementing an NECS program government shares with business powerful incentives for extensive partnership and sharing of responsibility. Clearly the investment costs of wholesale technological change are very significant and government may want to let the private sector make the largest possible share of those investments. Economic efficiency favors this approach also because business has far more flexibility to manage the high level of risk inherent in technological change. Fortunately, market mechanisms can be made to operate also to further this approach. Most notably, given appropriate government policies, business can assume primary responsibility for ownership, financing, and operation of the NECS services market, as it occurs in large measure in Canada through the private sector operation of the Merx system. The scope of public-private partnership in NECS is extensive across the four implementation tracks as shown in the table 1 below, and even larger during normal operation of NECS markets. Government's oversight responsibility over the operation of the public procurement function will obviously continue under NECS as a matter of law. However, exercise of this responsibility will be profoundly different. Under NECS, monitoring legal and regulatory compliance will need to be done at a higher level of sophistication, efficiency, and skill, for three main reasons: first, transaction processing responsibility is now split between purchasing agencies and electronic marketplaces; second, information and communication technologies replace progressively larger and more crucial elements of the document technology of present systems; third, complex performance analysis is possible now through electronic systems and data bases

Table 7. Public-private partnership on the realization stage of NECS program within its different tracks.

Implementation Tracks	**Building Blocks**	**Government Role**	**Private Sector Role**

Governance	1. legal, regulatory framework	• formulate	• advice, assist
	2. oversight systems	• build	• adapt to
Human Resources	3. Supportive, well-trained human resources	• educate, train (gov't work force) • incentive systems design, implement	• hire, train (business work force)
Institutions	4. Redesigned work flows	• design, implement (within gov't)	• design, implement (within business)
	5. Uniform data schemes	• define, implement	• advice, implement
	6. EC services market	• enable, • {own, finance, operate} • regulate	• own & finance {all or part} • operate {all or part}
Technology	7. Telecommunications Infrastructure	• enable • regulate	• finance, • deploy, • operate
	8. Access technology infrastructure	• finance, deploy (within gov't)	• finance, deploy (within business)
	9. EC systems	• specify; • {finance} • {develop}	• specify; • finance {all or part} • develop {all or part}
	10. Back office systems	• redesign • {implement or outsource}	• interface • provide as service

Legal, regulatory framework

In 2001 Secretariat of ASEAN[8] published "Reference framework for electronic commerce legal infrastructure"[9]. This reference framework was developed based on the following e-commerce laws of ASEAN member states, and in consultation with the legal experts from the governments of these member states:

- Electronic Transactions Act (ETA) of Singapore
- Digital Signature Act (DSA) of Malaysia
- Electronic Commerce Act (ECA) of Philippines
- Electronic Transactions Order (ETO) of Brunei
- Draft Electronic Transactions Bill (ETB) of Thailand

These e-commerce laws were in turn based largely on UNCITRAL[10] Model Law on Electronic Commerce and Draft Model Law on Electronic Signatures, as well as the e-commerce and electronic signature laws of the US (e.g. Utah, Illinois) and Europe (e.g. Germany).

General Principles of e-Commerce Laws

The general principles of e-commerce laws are:

- They should conform to international standards such as UNCITRAL Model Law on Electronic Commerce and Draft Model Law on Electronic Signatures so as to be interoperable with similar laws of other countries;
- They should be transparent and predictable so that there is no legal ambiguity between transacting parties in an electronic transaction;

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[8] http://www.aseansec.org/ , ASEAN members (Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei Darussal, Vietnam , Laos, Myanmar , and Cambodia) are mostly APEC members.

[9] E-ASEAN REFERENCE FRAMEWORK FOR ELECTRONIC COMMERCE LEGAL INFRASTRUCTURE -- ASEAN SECRETARIAT, 2001 – 19 p.

[10] UNCITRAL (United Nations Commission on International Trade Law) is the core legal body within the United Nations tasked by the UN General Assembly to further the progressive harmonisation and unification of international trade law, including international e-commerce law

- They should be technology neutral, i.e. no discrimination between different types of technology;
- They should be media neutral, i.e. paper-based commerce and e-commerce are to be treated equally by law.

Scope and Legal Effects of e-Commerce Laws

E-Commerce legislation is enacted with the purpose of providing predictability and certainty in areas where existing laws fall short. It is meant to encourage business and consumer confidence in e-commerce as well as provide legal recognition of electronic transactions, electronic records and electronic signatures. The legal effects are:

- a. A contract can be formed electronically, unless otherwise agreed between the parties;
- b. No record should be denied any legal effect just because it is a form of electronic record;
- c. Where a rule of law requires information to be in writing, an electronic record would satisfy that rule if it is accessible for subsequent reference;
- d. Electronic signatures meet all existing requirements for handwritten signatures.

Contracts that must still be made in writing and signed by the contracting parties include:

- a. Contracts for the sale or other disposition of immovable property or any interest in immovable property;
- b. Powers of attorney;
- c. Wills;
- d. Negotiable instruments;
- e. Documents of title.

Provisions of e-Commerce Laws

E-Commerce laws should at least include the following features:

- Electronic Transactions. Provisions clarifying that the normal rules of contract apply equally to transactions conducted online:

- The legal recognition of an expression of offer and acceptance through an electronic record, including a declaration of will or notice and other statements associated with the formation of an electronic contract;
- The rules to attribute an electronic record sent by an authorised sender or an automated system, and the circumstances in which a recipient of an electronic record is entitled to presume that a particular electronic record is from a particular sender;
- The rules on acknowledging the receipt of an electronic record;
- The rules determining the time and place an electronic record is considered as having been sent to, or received from, another person.

Provisions governing the legal effects of using electronic records and electronic signatures/digital signatures:

- Information given in an electronic record should not be denied any legal effect merely on the basis that it is in electronic form;
- A reliable electronic record should be legally valid and enforceable, subject to reasonable exceptions;
- A reliable electronic record should satisfy certain legal requirements for information to be in written form or presented in writing, subject to reasonable exceptions;
- A reliable electronic signature should satisfy any law that requires a signature for a document, subject to reasonable exceptions;
- There should be rules to prove an electronic signature.

Provisions governing presumptions regarding reliable electronic records and electronic signatures/digital signatures:

- a. There should be rules to govern the circumstances under which electronic records and electronic signatures/digital signatures are treated as reliable records and signatures, and the rebuttal presumptions applicable to them.

Trusted Third Parties/Certification Authorities.

- Provisions governing the duties of trusted third parties (TTPs)/ certification authorities (CAs).
- Provisions governing the duties between subscribers and their TTPs/CAs, including the issuance, management, suspension and revocation of digital certificates.
- Provisions governing the regulation and licensing of TTPs/CAs, including the appointment of a controller of TTPs/CAs.

The following is not mandatory but is included to define explicitly the rules governing the roles and responsibilities of service providers

Service Providers . Provisions governing the extent of legal liability of service providers. Network service providers should be exempted from any criminal or civil liability for merely providing access to third-party online content over which they have no editorial control.

Presumptions of e-Commerce Laws

These presumptions come into operation when the issues are not dealt with explicitly in the contract. They are meant to dispel uncertainty concerning the legal effect, transmission and receipt of electronic records:

- There is no difference between electronic records and paper documents.
- An electronic record can replace a written document.
- Parties can contract electronically.
- Electronic records are admissable as evidence in court.
- If the electronic record is sent, the recipient is entitled to act on the record.
- If the sending of an electronic record is conditional upon acknowledgement of receipt, the record is not sent until the acknowledgement has been received.
- When a sender receives the recipient's acknowledgement of receipt, the electronic record is deemed received by the recipient. An electronic record is sent when it enters a computer server/router outside the sender's control. An electronic record is received when it enters the addressee's computer/router.
- An electronic record is sent from the sender's place of business and received at the recipient's place of business.

Implementation of e-Commerce Laws

In this section the differences in the implementation of e-commerce laws among ASEAN member states are highlighted.

Electronic Transactions Legislation. Malaysia is the only one out of the five ASEAN member states with e-commerce laws that does not have a comprehensive electronic transactions legislation. It has chosen the path of enacting the DSA to take care of digital signatures, leaving the other components of electronic transactions to existing laws, including common law, instead.

Electronic Signatures/Digital Signatures. While the e-commerce laws of Singapore, Brunei, Thailand and Philippines have presumptions relating to electronic signatures, Malaysia DSA pertains strictly to presumptions relating to digital signatures. In Malaysia DSA, the digital signature must be "verified by reference to the public key listed in a valid certificate issued by a licensed certification authority". Singapore ETA and Brunei ETO also make distinction of secure electronic signatures, which must fulfill three requirements:

- a prescribed security procedure,
- a commercially reasonable security procedure agreed to by both transacting parties, and
- must be verifiable as unique to a person, identify him/her and must have been "created through means that are under the full control of the signer".

Licensing of CAs. Singapore has opted for a voluntary licensing scheme for CAs. This is because the Singapore government does not want to stifle the development and growth of the fledgling CA industry in Singapore by subjecting the CAs to the stringent regulations pertaining to licensees. This policy may be reviewed later when the CA industry matures.

Under Singapore's regime, a licensed CA enjoys three benefits compared to a non-licensed CA:

- A licensed CA will enjoy the benefits of evidentiary presumption for digital signatures generated from the digital certificate it issues. Without such a presumption, a party that intends to rely on a digital signature must produce enough evidence to convince the court that the signature has been created under conditions that will render it trustworthy. With the presumption, the party relying on the digital

signature merely has to show that the signature has been correctly verified, and the onus is on the other party disputing the signature to prove otherwise.

- The liability of the CA will be limited under the ETA. The CA will not be liable for any loss caused by the reliance on a false or forged digital certificate of a subscriber so long as the CA has complied with the requirements under the ETA. If the licensed CA fails to observe some of its obligations, the CA will only be liable up to the reliance limit specified in the digital certificate.
- The licensing of a CA by the Controller is an indication that the CA has met the stringent regulatory requirements established. It is an indication to the public that the CA is trustworthy and deserving of consumer confidence. Together with the ease of proof in using digital signatures, there can be greater reliance on such CAs.

Although Singapore ETA does not require CAs to be licensed, it does impose a number of requirements on CAs without regard to whether they are licensed or not. For example, all CAs, licensed or unlicensed, must either issue a Certification Practice Statement or abide by the statutorily-prescribed requirements for issuing a digital certificate. Additionally, all CAs must comply with statutory standards for disclosing material information about a digital certificate and the procedures for revoking or suspending a certificate.

Brunei also has a voluntary licensing scheme. Thailand's regime is one of "voluntary unless otherwise directed". Malaysia, on the other hand, has implemented a "mandatory unless otherwise exempted" licensing scheme under its DSA. For Malaysian licensed CAs, they are also not liable for "punitive or exemplary damages", and "damages for pain or suffering".

Liability of Service Providers . As mentioned in an earlier section, Singapore's ETA has special provisions on the legal liabilities of service providers.

Other Related Legislation

It should be noted that while e-commerce laws enable electronic transactions to take place with trust, confidence and certainty in cyberspace, they have to be complemented by other related legislation to ensure the interests of businesses and consumers are protected. Relevant legislation, regulations or codes of practice include:

- Data privacy and protection
- Consumer protection

- Computer crimes/computer misuse
- Copyright, trademarks, intellectual property rights
- Admissibility of computer output as evidence in court (e-notarisation)
- Internet code of practice
    - Taxation
    - Trade policy and market access
    - Competition laws and policy
    - E-funds
- Advertising code of practice

Cross-Border Issues to be Addressed. In cross-border e-commerce (paperless trade), some of the issues that need to be addressed are:

- Jurisdiction – Which court may hear and resolve the dispute between contracting parties from two different countries? Which law to use? Whether the court judgment obtained in one jurisdiction is enforceable in another jurisdiction?
- Taxation – Where should the source(s) of income be if the electronic transaction occurs in multiple countries? Which tax regime should be used? Which jurisdiction should the taxes accrue to?
- International transfers of personal data (http://www.iccwbo.org/policy/ebitt/)

NECS Toolkit

Toolkit for NECS high level design and development (table 8 below) was synthesized from the toolkits created in the frameworks of the e-government procurement (e-GP) international projects presented on following web sites:

- World Bank's "Electronic government procurement" portal[11] ;
- The Multilateral Development Banks Electronic Government Procurement Portal[12] ;

[11] http://wbln0018.worldbank.org/OCS/egovforum.nsf/main/home

[12] http://www.mdb-egp.org

- The Organization of American States Government Best Practices Program[13]. Profiles of Electronic Government Procurement.

Low level toolkits destined to SME could be found on other sites[14].

Table 8. NECS high level development toolkit.

NECS high level development toolkit tree structure for APEC member-economies		**Name of the tool**	**Comments**
1. EC functions' model and model of functioning		EC trade site model of functions, Models of e-Shopping, e-Reverse Auctions and e-Direct Auctions	Requirements of paperless trade should be taken into account
2. Institutionali-zation model		The set of NECS stakeholders (Audit entities, Coordination entities, Disputes resolution entities, Monitoring and measurement entities, Operating entities, Oversight entities, Policy	

[13] http://iacd.oas.org/

[14] http://insight.zdnet.co.uk/internet/ecommerce/0,39020454,2137100,00.htm , http://www.ecommerce-guide.com/ , http://www.motherlode.biz/solutions.php?solutions=2 , http://www.aclwebsite.co.uk/egovernment.htm

NECS high level development toolkit tree structure for APEC member-economies		Name of the tool	Comments
		formulation entities, Regulatory entities, Standardization entities, e.a.), theirs roles, responsibilities and patterns of relations (subordination) and communications on different stages and phases of NECS life cycle	
3. Program for NECS creation, covering its whole life cycle	Stages of the program: planning, realization and maintenance	EC Readiness Assessment, EC Strategic Planning Guide	World Bank proposes the necessary tools http://www.worldbank.org/ieg/ecd/tools/
	Phases of the realization stage: first, second, third, forth	EC Roadmap	
4. Program parallel tracks			
4.1. Program governance documents	Guidelines	EC Strategic Overview	Objectives pursued in development of the NECS. Strategies for the development of the NECS. Maximisation of EC benefits: • Economic and social impact • SME

NECS high level development toolkit tree structure for APEC member-economies		Name of the tool	Comments
			• Gender features • Education and training • ICT and territorial development • Cooperation with national and international donors • Participation in global EC • EC development measurement and benchmarking
	Legal, regulatory framework	• Laws and regulations governing NECS and e-commerce. • Scope (institutional coverage and exceptions) • Complaints and appeals: Procedures Responsible entities	
	Infoware	General information provided by the EC system to users: • Policies,	.

NECS high level development toolkit tree structure for APEC member-economies		Name of the tool	Comments
		strategies, laws and regulations. • List of buying entities and information on procurement planning, by entity. • Registration requirements for suppliers	
	Information systems (IS) creation methodology, ICT standards applicable to EC systems	EC system creation framework IS design and development methodology. EC Standards Framework	A lot of this kind of methodologies exists, including those standards approved by ISO for IS life cycle, quality, see http://en.wikipedia.org/wiki/System_Development_Life_Cycle
4.2. Human capital	Supportive, well-trained human resources	EC staff education framework	
4.3. ICT-technologies	Communication infrastructure	Requirements to EC communication infrastructure	
	Access infrastructure	Requirements to EC access infrastructure	
	Trust infrastructure	EC Authentication, EC PKI	

NECS high level development toolkit tree structure for APEC member-economies		Name of the tool	Comments
		EC PK Directory EC customer protection EC customer private data protection EC transparency EC security	
	Payment systems	Payment system framework	Paperless trade should be taken into account
	Information resources	Types of information resources	
	EC systems services	Requirements for the use of NECS. Auction systems. Buyer and Supplier Activation Guide	Should cover: • Publicity, clarification, reception of bids and information on purchases. • Tender notices -- publication and delivery of notices to suppliers. • Bidding documents and ways of accessing them. • Clarifications and minutes of bidders' conferences. • Reception of bids.

NECS high level development toolkit tree structure for APEC member-economies		Name of the tool	Comments
			• Contracts and records of award proceedings. Reports and user support: • Procurement reports and statistics. • User assistance Transactions: • Direct purchase. • Price quotations. • Tendering/bidding. • Payment
	Back office systems	Electronic document management system framework, Document archive management E-mail	
	Embedding EC systems into supply chains	Paperless trade chains framework Value chain framework	

ANEXES

Glossary of NECS's terms

Terms	Explanations
Authentication	**Authentication** is the act of establishing or confirming something or someone as authentic. In computer security, **authentication** (Greek: *αυθεντικός*, from 'authentes'='author') is the process by which a computer, computer program, or another user attempts to confirm that the computer, computer program, or user from whom the second party has received some communication is, or is not, the claimed first party. A blind credential, in contrast, does not establish identity at all, but only a narrow right or status of the user or program. In a Web of trust "authentication" is a way to ensure users are who they say they are—that the user who attempts to perform functions in a system is in fact the user who is authorized to do so. To distinguish authentication from the closely related term authorization, the short-hand notations **A1** (authentication) and **A2** (authorization) are occasionally used. The problem of authorization is often thought to be identical to that of authentication; many widely adopted standard security protocols, obligatory regulations, and even statutes are based on this assumption. However, there are many cases in which these two problems are distinct.

Terms	Explanations
	One familiar example is access control. A computer system supposed to be used only by those authorized must attempt to detect and exclude the unauthorized. Access to it is therefore usually controlled by insisting on an authentication procedure to establish with some established degree of confidence the identity of the user, thence granting those privileges as may be authorized to that identity. Common examples of access control involving authentication include: • withdrawing cash from an ATM. • controlling a remote computer over the Internet. • using an Internet banking system. However, note that much of the discussion on these topics is misleading because terms are used without precision. Part of this confusion may be due to the 'law enforcement' tone of much of the discussion. No computer, computer program, or computer user can 'confirm the identity' of another party. It is not possible to 'establish' or 'prove' an identity, either. There are tricky issues lurking under what appears to be a straightforward surface. It is only possible to apply one or more tests which, if passed, have been previously declared to be sufficient to proceed. The problem is to determine which tests are sufficient, and many such are inadequate. There have been many instances of such tests having been spoofed successfully; they have by their failure shown themselves, inescapably, to be inadequate. Many people continue to regard the test(s) -- and the decision to regard success in passing them—as acceptable, and blame their failure on 'sloppiness' or

Terms	Explanations
	'incompetence' on the part of someone. The problem is that the test was supposed to work in practice -- not under ideal conditions of no sloppiness or incompetence—and did not. It is the test which has failed in such cases. Consider the very common case of a confirmation email which must be replied to in order to activate an online account of some kind. Since email can easily be arranged to go to or come from bogus and untraceable addresses, this is just about the least authentication possible. Success in passing this test means little, without regard to sloppiness or incompetence. Source: wikipedia.
Backbone	The top level of a hierarchical network. The main pipes along which data is transferred.
Bandwidth	The amount of information or data that can be sent over a network connection in a given period of time. Bandwidth is usually stated in bits per second (bps), kilobits per second (kbps), or megabits per second (mps).
Broadband	A frequency band divisible into several narrower bands so that different kinds of transmissions such as voice, video, and data transmission can occur at the same time.
Certification Authority	Person who or entity which issues certificates or provides other services related to electronic signatures to the public.
Consumer Confidence	
Copyright	Is a set of exclusive rights granted by governments to regulate the use of a particular expression of an idea or information. At its most general, it is literally "the right

Terms	Explanations
	to copy" an original creation. In most cases, these rights are of limited duration. The international symbol for copyright: ©. Copyright may subsist in a wide range of creative or artistic forms or "works". These include poems, plays, and other literary works, movies, choreographic works (dances, ballets, etc.), musical compositions, audio recordings, paintings, drawings, sculptures, photographs, software, radio and television broadcasts of live and other performances, and in some jurisdictions industrial designs. Copyright is a type of intellectual property; designs or industrial designs may be a separate or overlapping form of intellectual property in some jurisdictions. Source: wikipedia.
Curriculum	In education, a curriculum (plural curricula) is the set of courses and their contents offered by an institution such as a school or university. In some cases, a curriculum may be partially or entirely determined by an external body (such as the National Curriculum for England in English schools). In the U.S., the basic curriculum is established by each state with the individual school districts adjusting it to their desires; in Australia each state's Education Department sets the various curricula. Note that the term curriculum may relate to the range of courses that students can select from (as defined above) but may also relate to a specific learning programme. In the latter context, the curriculum describes the collective teaching, learning and assessment materials that are available for that particular course.

Terms	Explanations
	A crucial part of the curriculum is the definition of the course objectives which are often expressed in terms of learning outcomes and normally includes the assessment strategy for the programme. These learning outcomes (and assessments) are often grouped into units (or modules) and the curriculum, therefore, comprises a collection of such units, each specialising on a specific part of the curriculum. So a typical curriculum would include units on communications, numeracy, information technology, inter-personal skills together with more specialised provision.
Deminimis (de minimis) level	An amount small enough to be of no concern. Source: http://web.em.doe.gov/takstock/glossary.html
Dedicated line	A telecommunications line that is reserved for the singular purpose, for example providing a data connection between two computers.
Dial-up	1. A temporary connection between computers established over a telephone line. 2. To establish a temporary connection to another computer.
Digital	A device or method that uses discrete variations in voltage,frequency, amplitude, location, etc. to encode, process, or carry binary (zero or one) signals for sound, video, computer data or other information. Digital communications technology generally permits higher speeds of transmission with a lower error rate than can be achieved with analog technology. When analog signals are received and amplified at each repeater station, any noise is also amplified. A digital signal, however, is detected and regenerated (not amplified). Unlike amplification, any noise (less than a valid signal) is eliminated by

Terms	Explanations
	digital regeneration.
Domain Name	The domain name identifies a Web site.
Domain Name System (DNS)	NS maps Internet addresses. To function as part of the Internet, a host needs a domain name that has an associated Internet Protocol (IP) address record. The DNS is a database system that looks up host IP addresses based upon domain names. For example if you ask for "www.thisismyhost.com" it will return "123.45.67.89". Top Level Domains (TLD) Domain names are derived from a hierarchical system, with a host name followed by a top-level domain category. A top-level domain name can either be an ISO country code (e.g. .th for Thailand) or one of the generic top level domains (gTLDs). Generic Top Level Domains (gTLD) Generic top-level domain categories are .com (for commercial enterprises), .org (for non-profit organizations), .net (for network services providers), .edu (for educational institutions), .mil (for the military), and .gov (for government). Domain registrations: Distribution of Internet hosts under gTLD (.com, .org, etc) registrations according to the number of gTLD registrations from the respective countries (rather than allocating all hosts under gTLD registrations to the United States).
Digital Subscriber Line (DSL)	Is a family of technologies that provide digital data transmission over the wires used in the "last mile" of a local telephone network. Typically, the download speed of DSL ranges from 128 kilobits per second (Kbps) to 24,000 Kbps depending on DSL technology

Terms	Explanations
	and service level implemented. Upload speed is lower than download speed for asynchronous ADSL and symmetrical for SDSL. Source: wikipedia
Electronic Data Intergange (EDI)	**Electronic Data Interchange** (**EDI**) is the computer-to-computer exchange of structured information, by agreed message standards, from one computer application to another by electronic means and with a minimum of human intervention. In common usage, EDI is understood to mean specific interchange methods agreed upon by national or international standards bodies for the transfer of business transaction data, with one typical application being the automated purchase of goods and services. Despite being relatively unheralded, in this era of technologies such as XMLservices, the Internet and the World Wide Web, EDI is still the data format used by the vast majority of electronic commerce transactions in the world. Source: wikipedia
Electronic commerce (EC)	Electronic commerce, e-commerce or ecommerce consists primarily of the distributing, buying, selling, marketing, and servicing of products or services over electronic systems such as the Internet and other computer networks. The information technology industry might see it as an electronic business application aimed at commercial transactions. It can involve electronic funds transfer, supply chain management, e-marketing, online marketing, online transaction processing, electronic data interchange, automated inventory management systems, and automated data-collection systems. It typically uses electronic communications technology such as the

Terms	Explanations
	Internet, extranets, e-mail, E-books, databases, and mobile phones. Source: wikipedia
Electronic signature	In recent years, the terms *electronic signature* and digital signature have come into widespread, and somewhat confused, use. **Electronic signature** is often used to mean either a signature imputed to a text via one or more of several electronic means, or cryptographic means to add non-repudiation and message integrity features to a document. *Digital signature* usually refers specifically to a cryptographic signature, either on a document, or on a lower-level data structure. The confusion in terminology is unsatisfactory in many respects, and will remain so until usage, especially in statutes and regulations, becomes more standardized. Source: wikipedia
e-mail	Electronic mail, the computer-based exchange of mail.
Encryption	In cryptography, **encryption** is the process of obscuring information to make it unreadable without special knowledge. While encryption has been used to protect communications for centuries, only organizations and individuals with an extraordinary need for secrecy had made use of it. In the mid-1970s, strong encryption emerged from the sole preserve of secretive government agencies into the public domain, and is now employed in protecting widely-used systems, such as Internet e-commerce, mobile telephone networks and bank automatic teller machines. Encryption can be used to ensure secrecy, but other techniques are still needed to make communications secure, particularly to verify the integrity and authenticity of a message; for example, a

Terms	Explanations
	message authentication code (MAC) or digital signatures. Another consideration is protection against traffic analysis. Encryption or software code obfuscation is also used in software copy protection against reverse engineering, unauthorized application analysis, cracks and software piracy used in different encryption or obfuscating software. Source: wikipedia
Host	A computer that provides data, applications and other services, and that allows users to communicate with other host computers on a network.
Information and Communications Technology (ICT)	**Information technology** (IT) or **Information and communication(s) technology** (ICT) is a broad subject concerned with technology and other aspects of managing and processing information, especially in large organizations. In particular, IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and retrieve information. For that reason, computer professionals are often called **IT specialists**, and the division of a company or university that deals with software technology is often called the **IT department**. Other names for the latter are information services (IS) or management information services (MIS). Source: wikipedia
Integrated Services Digital Network (ISDN)	is a type of circuit switched telephone network system, designed to allow digital transmission of voice and data over ordinary telephone copper wires, resulting in better quality and higher speeds than available with analog systems. More broadly, **ISDN** is a set of protocols for establishing and breaking circuit switched connections, and for advanced call features

Terms	Explanations
	for the user. The English term is a "backronym", thought better for English-language advertisements than the original, "Integriertes Sprach- und Datennetz" (German for "integrated voice and data net"). In a videoconference, ISDN provides simultaneous voice, video, and text transmission between individual desktop videoconferencing systems and group (room) videoconferencing systems. Source: wikipedia.
Interconnection/Interconnection charge	A charge levied by network operators on service providers for interconnection with their network.
Internet	A worldwide network of networks that all use the TCP/IP communications protocol and share a common address space. First incarnated as the ARPANET in 1969, the Internet has metamorphosed from a military internetwork to an academic research internetwork to the current commercial internetwork. It commonly supports services such as email, the World Wide Web, file transfer, and Internet Relay Chat. The Internet is experiencing tremendous growth in the number of users, hosts, and domain names.
Internet Service Provider (ISP)	1. A business that delivers access to the Internet, usually for a monthly fee. PSI, UUNET, and Netcom are examples of established ISPs but there are thousands of smaller ones all around the world. 2. A business that provides Internet services, such as web site hosting, or web site development
Interoperability	The ability of software and hardware on multiple machines from multiple vendors to communicate meaningfully.
Kilobites per second (Kbps)	See "Bandwidth"
Liability	In the most general sense, a **liability** is anything that is a hindrance, or puts one at a disadvantage. Source:

Terms	Explanations
	wikipedia
Leased line	A two-way link for the exclusive use of a subscriber regardless of the way it is used by the subscriber (e.g. switched subscriber or non-switched, or voice or data). They can be either national or international in scope.
Local Area Network (LAN	A group of connected computers at a single location (usually an office or home).
Megabites per second (Mbps)	See "Bandwidth"
Modem	A modulator/demodulator. A device that converts analogue signals to digital and vice versa. Can be used to connect computers via the phone lines. It can also be used to connect them through cable networks etc.
Mobile commerce	**Mobile commerce, m-commerce** or **mcommerce** stands for electronic commerce made through mobile devices. M-commerce is currently mainly used for the sale of mobile phone ring-tones and games, although as 3G/UMTS services roll out it is increasingly used to enable payment for location-based services such as maps, as well as video and audio content, including full length music tracks. Other services include the sending of information such as football scores via SMS. Currently the main payment methods used to enable m-commerce are: • premium-rate calling numbers, • charging to the mobile telephone user's bill or • deducting from their calling credit, either directly or via reverse-charged SMS. 'M-commerce' was coined in the late 1990s during the

Terms	Explanations
	dot-com boom. The idea that highly profitable M-commerce applications would be possible though the broadband mobile telephony provided by 2.5G and 3G cellphone services was one of the main reasons for hundreds of billions of dollars in licensing fees paid by European telecommunications companies for UMTS and other 3G licenses in 2000 and 2001. Other examples of M-commerce applications are information-on-demand systems like news services or stock tickers, banking and stock brokerage applications by SMS, WAP or iMode. Source: wikipedia.
Network	A configuration of data processing devices and software connected for information interchange.
Packet	A block of data sent across a network. When a large quantity of data is to be sent over a network, it is broken up into several packets, sent, and the reassembled at the other end. Packets often include checksum codes to detect transmission errors. The exact layout of an individual packet is determined by the protocol being used.
Personal Computer (PC)	A desktop, freestanding, or portable microcomputer that usually consists of a system unit, a display, a keyboard, one or more diskette drives, internal fixed-disk storage, and an optional printer. PCs are designed primarily to give independent computing power to a single user and are inexpensively priced for purchase by individuals or small businesses
Privacy	Is the ability of an individual or group to stop information about themselves from becoming known to people other than those whom they choose to give the information. Privacy is sometimes related to

Terms	Explanations
	anonymity although it is often most highly valued by people who are publicly known. Privacy can be seen as an aspect of security—one in which trade-offs between the interests of one group and another can become particularly clear. The right against unsanctioned intrusion of privacy by the government, corporations or individuals is part of many countries' laws, and in some cases, constitutions or privacy laws. Almost all countries have laws which in some way limit privacy, for example taxation normally requires passing on information about earnings. In some countries individual privacy may conflict with freedom of speech laws and some laws may require public disclosure of information which would be considered private in other countries and cultures. Privacy may be voluntarily sacrificed, normally in exchange for perceived benefits, but often with little benefit and very often with specific dangers and losses. An example of voluntary sacrifice is entering a competition; a person gives personal details (often for advertising purposes), so they have a chance of winning a prize. Another example is where information voluntarily shared is later stolen or misused such as in identity theft. Source: wikipedia.
Public Key Infrastructure (PKI)	In cryptography, a **public key infrastructure** (**PKI**) is an arrangement which provides for third-party vetting of, and vouching for, user identities. It also allows binding of public keys to users. This is usually carried out by software at a central location together with other coordinated software at distributed locations.

Terms	Explanations
	The public keys are typically in certificates. The term is used to mean both the certificate authority and related arrangements as well as, more broadly and somewhat confusingly, the use of public key algorithms in electronic communications. The latter sense is erroneous since PKI methods are not required to use public key algorithms. Source: wikipedia
Public Switched Telephone Networks (PSTN)	Most widespread type of telecommunications network. It was originally set up for voice telephony, which is reflected in its bandwidth, coding techniques and switching capacity. Digitalization of the PSTN significantly increases its capacity.
Readiness	Is the degree to which an economy or community is prepared to participate in the digital economy. Every economy, regardless of its level of development, presents a *readiness profile* on the global stage, composed of its national policies, level of technology integration, and regulatory practices. Readiness is assessed by determining the relative standing of the economy in the areas that are most critical for e-commerce participation
Secure Electronic Transaction (SET)	Is a standard protocol for securing credit card transactions over insecure networks, specifically, the Internet. SET was developed by VISA and MasterCard (involving other companies such as GTE, IBM, Microsoft and Netscape) starting in 1996. SET makes use of cryptographic techniques such as digital certificates and public key cryptography to allow parties to identify themselves to each other and exchange information securely. SET was heavily publicised in the late 1990's as the

Terms	Explanations
	credit card approved standard, but failed to win market share. Reasons for this include; need to install client software (an eWallet), cost and complexity for merchants to offer support and comparatively low cost and simplicity of the existing, adequate SSL based alternative. Source: wikipedia
Secure electronic Commerce Environment (SECE)	SECE will enable secure and reliable EC transactions between companies and consumers over open networks, such as the Internet. Source: Hitachi
Secure Sockets Layer protocol (SSL)	Security protocol for encrypted transmission over the Internet. The protocol allows client/server applications to communicate in a way that cannot be easily eavesdropped. Servers are always authenticated and clients are optionally authenticated. It sets up a secure end-to-end link over which http or any other application protocol can operate. **SSL with third party certification:** Third party certification provides the additional security (authentication) to the SSL required for electronic commerce. Self-generated certificates are not considered to provide the necessary level of security. By making a survey of SSL-based sites, excluding those without third party certification makes it possible to get an indication of the number of electronic commerce sites (e.g. Netcraft Web Surveys, http://www.netcraft.com/Survey/)
Security	Is the condition of being protected against danger. In the general sense, security is a concept similar to safety. The nuance between the two is an added emphasis on being protected from dangers that originate

Terms	Explanations
	from outside. Individuals or actions that encroach upon the condition of protection are responsible for the breach of security. Source: wikipedia
Server	A computer that provides information to client machines. For example, there are web servers that send out web pages, mail servers that deliver email, list servers that administer mailing lists, FTP servers that hold FTP sites and deliver files to users who request them, and name servers that provide information about Internet host names
Small and Medium Enterprises (SMEs)	Are companies whose headcount or turnover falls below certain limits. The abbreviation SME occurs commonly in the EU and in international organizations, such as the World Bank, the United Nations and the WTO. The term Small or Medium sized Business or SMB has become more standard in a few other countries. EU Member States traditionally had their own definition of what constitutes an SME, for example the traditional definition in Germany had a limit of 500 employees, while (for example) in Belgium it could have been 100. But nowadays the EU has started to standardise the concept. Its current definition categorises companies with fewer than 50 employees as "small", and those with fewer than 250 as "medium". As of 2005, Germany will use the definition of the European Commission. Business enterprises of fewer than 10 employees often class as SOHO (for Small office/home office). In most economies, smaller enterprises predominate.

Terms	Explanations
	In the EU, SMEs comprise approximately 99% of all firms and employ between them about 65 million people. SMEs, in contrast to big business, have a reputation for innovation. For this reason, and because of their difficulties in attracting capital, national and regional fostering of SMEs commonly occurs. In the United States there is no standard definition for a small business. Generally it is determined by the industry in which it competes, where income and number of employees will determine whether a company is a small business or not. Many government contracts are "set aside" (i.e., competition is limited to small businesses only, most often involving services or minor construction). Source: wikipedia
Symmetric bandwidth services	Services where the available bandwidth for upload and download are equal.
Telecommunications	The sending of signals representing voice, video, or data through telephone lines
Trust to e-commerce	Trust is based on experience over time; it can either strengthen or weaken. The process of trust begins when one perceives indications that an online company maybe trustworthy. These indications are known as "forms" (Cheskin, 1999). Manners, professionalism, and sensitivity are examples of these indications. Once the forms representing trustworthiness are strengthened over time, they are transformed into "character traits". These traits include dependability, honesty, and reliability. Once an online company possesses the "character", one will be more likely to purchase items from them. The experience over time is very important in a commercial

Terms	Explanations
	relationship(Cheskin, 1999). Internet security and privacy are issues that must be first addressed. In satisfying people on these issues, the most important step is to building trust with e-commerce. There are six types of forms for e-commerce trust: 1) Seals of Approval Symbols of security, such as MasterCard, reassure that proper security measures have been put into place. 2) Brand The credibility of the online company based on reputation, the promise to deliver certain criteria and a person's previous experience dealing with the company. 3) Navigation The ease of finding what you want 4) Fulfillment Clear explanations of how orders are processed and what to do if there are any problems 5) Presentation The design of the site must present professionalism and quality. 6) Technology The site uses new technology to indicate

Terms	Explanations
	professionalism. **Three Forms are Key for E-Commerce Trust** Navigation, the ease of finding information, is the key form needed for e-commerce trust. A well-known brand and fulfillment are the other two forms involved in e-commerce trust. Navigation must be associated with one or both of the other forms in order for an online business to be consider trustworthy. Strong navigation increases a user's perception that a web site will meet a user's needs. If an online business is strong in all three forms, it does not mean it will be perceived the most trustworthy. For example, Barnes and Noble is considered to be strong in all three forms but was considered less trustworthy than a Amazon.com, whose site lacks fulfillment (Cheskin, 1999). For online businesses with lesser-known or newer brands, navigation and fulfillment are key to gaining e-commerce trust. These businesses must have sites with strong navigation and strong fulfillment in order to compete with the well-known brands. As navigation and fulfillment improve, so does e-commerce trust.Source: Fred Lee
United Nations Commission on International Trade Law (UNCITRAL)	Established by the United Nations General Assembly in 1966 to reduce or remove obstacles to international trade created by disparities in national laws. Its mandate is to work towards a progressive harmonization and unification of the law of international trade
Universal Access	Derivative from the Universal Service concept, which

Terms	Explanations
	states that every individual within a country should have basic telecommunication service available at an affordable price. The precise definition of this concept varies among countries
Universal Service	In telecommunications, *universal service* was conceived by Theodore Vail, at AT&T, in the late 1800s; any user could connect. This concept has been extended to users on the Internet. Universal service is an evolving level of telecommunications services that : (A) are essential to education, public health, or public safety; (B) have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers; (C) are being deployed in public telecommunications networks by telecommunications carriers; and (D) are consistent with the public interest, convenience, and necessity. The Universal Service Principles are: (1) Quality and rates.--Quality services should be available at just, reasonable, and affordable rates. (2) Access to advanced services.--Access to advanced telecommunications, broadband and information services (Internet) should be provided in all regions of the territory. (3) Access in rural and high cost areas.--Consumers in all regions of the territory, including low-income consumers and those in rural, insular, and high cost

Terms	Explanations
	areas, should have access to telecommunications and information services, including interexchange services, broadband and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas. (4) Equitable and nondiscriminatory contributions.--All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service. (5) Specific and predictable support mechanisms.--There should be specific, predictable and sufficient public mechanisms to preserve and advance universal service. (6) Access to advanced telecommunications services for schools, healthcare and libraries.--Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services. (7) Additional principles.--Such other principles as the Joint Board and the Commission determine are necessary and appropriate for the protection of the public interest, convenience, and necessity. In the United States, universal telecom service is implemented by the Universal Service Administrative Company. A small amount is charged to most telephone bills to support the FCC's universal service

Terms	Explanations
	programs. Part of the developing nations (e.g. South Africa) which can not implement a centralized Universal Service Fund (USF) mechanism, which includes funds redistribution scheme, fair tenders between the Service suppliers, rate control etc., are implementing Universal Serivice Obligations (USO). USO are the obligations to provide basic telecom services in certain areas at the fixed prices, which are imposed by the goverenment on the network operators (both mobile and fixed). In terms of corporate finance, such services become a burden for the operators, so virtually USO appears to be a tax. Alternatively, goverenment may impose such obligations on the one single operator dominating the market. Other market players not burdened with the USOs are paying Access Deficit Charges (ADC), compensating the dominating operator for the losses caused by the USO. This method, however, is criticized for it's anticompetitive effect. Source: wikipedia.
World Intellectual Property Rights Organization (WIPO)	Specialized intergovernmental organization of the United Nations system of organizations. Responsible for the promotion of the protection of intellectual property throughout the world through cooperation among States, and for the administration of various multilateral treaties dealing with the legal and administrative aspects of intellectual property. The main texts adopted by WIPO are the Trademark Law Treaty, the WIPO Copyright Treaty and the WIPO

Terms	Explanations
	Performances and Phonograms Treaty and the Agreement between the World Intellectual Property Organization and the World Trade Organization.
World Trade Organization (WTO)	International organization dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible. **WTO Information Technology Agreement (ITA)** WTO Ministerial Declaration on Trade in Information Technology Products, Singapore, 13 December 1996. The Declaration provides for the elimination of customs duties and other duties and charges on information technology products. **WTO Basic Telecom Agreement** - Results of the 3-year WTO negotiations on market access for basic telecommunications services. Annexed to the Fourth Protocol of the General Agreement on Trade in Services. Includes market opening commitments and commitments on regulatory principles of 72 countries across the globe. WTO Members were able to decide individually whether or not to file a Most Favored Nation (M.F.N) exemption on measures affecting trade in basic telecommunications services. **WTO Standstill Agreement for Tariffs** During the Geneva Ministerial Declaration on Global Electronic commerce held in May 1998, the Ministers declared that members would continue their current practice of not imposing customs duties on electronic transmissions, at least until the Third Session of the General Council in December 1999

Electronic Commerce questionnaire matrix

1. Access to Basic Infrastructure

The measures below are intended to give an indication of the availability of basic infrastructure in your area.

1.1 What is the teledensity (number of telephone lines per 100 people) in your economy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
11-20%	16,7%	0-5 %	about 55%	59-79%	11-20%

1.2 What percent of the area of your economy has access to digital wireless or other system such as Direct PC?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
51-75%	>80%	1-25%	76-100%	100%	1-25% 26-50%

1.3 What percentage of the population in your economy has digital wireless or Direct PC Internet access?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
50%	21-50%	1-5%	51-100%	51-100%	21-50%

1.4 What percent of your economy has access to cable?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
26-50%	N/A	1-24%	about 59%	76-100%	26-50%

1.5 What percentage of the population currently has access to the Internet via the cable network?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
6-20%	14%	1-5%	14%	2-52%	51-100%

1.6 Has your economy already started to license radio spectrum for voice, data and video network access as an alternative to the wire line "local loop" or "last mile"?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Yes	Yes	No	Yes	Yes	Yes

Speed and functionality of the infrastructure

The following questions will give an indication of the extent to which your economy is facing or risks facing a capacity bottleneck.

1.7 What is the highest connection speed supported by your infrastructure available to your consumer users?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
1.6-45Mbps	385kbps-1.5Mbps	57-384kbps	>45Mbps	>45Mbps	>45Mbps

1.8 What is the average connection speed available to your consumer users?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
57-384kbps	385kbps-1.5Mbps	56Kbps	1.6-45Mbps	>45Mbps	56Kbps

1.9 What is the highest connection speed supported by your infrastructure available to business users?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
1.6-45Mbps	_____	56-384 kbps	>45Mbps	>45Mbps	>45Mbps

1.10 What is the average connection speed available to your business users?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
385kbps-1.5Mbps	1.6-45Mbps	57-384 kbps	>45Mbps	>45Mbps	1.6-45Mbps

1.11 What is the highest connection speed available for wireless Internet access?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
57-384 kbps	385kbps-1.5Mbps	57-384 kbps	1.6-45Mbps	1.6-45Mbps	>45Mbps

1.12 Which users have dedicated or other high-speed (>1.5Mbps) digital access to the Internet?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Available to a broad array of large users	Widely available	Limited to certain categories of users (e.g. military, research institutions or major international businesses)	Widely available	_____	Widely available

1.13 How many ISDN or DSL subscribers are there per 1000 mainlines?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
>100	1-10	1-10	11-50	_____	1-10

1.14 Of the total number of residential lines, what percent represents additional (non-primary) lines?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
0-5%	0-5%	0-5%	Figures not available as our statistics indicated all exchange lines without distinguishing between primary and (non-primary) lines.	_____	0-5%

1.15 Are cable network upgrades underway to permit the interactive applications necessary for electronic commerce?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Some	Yes	Some	Not applicable as the cable operator has already upgraded at the network to digital to allow the provision of broadband services and applications including e-commerce.	_____	Some

Price

The following questions will give an indication of whether your economy enjoys competitive infrastructure prices.

1.16 What is the pricing structure charged to connect to the Internet on a dial-up basis:

a. For dial-up telecommunications services purchased by consumer/residential customers?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Minutes of Use	Minutes of Use	Minutes of Use	Minutes of Use	Minutes of Use	Flat-rate

b. For dial-up telecommunications services purchased by business customers?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Minutes of Use	Minutes of Use	Minutes of Use	Minutes of Use	Minutes of Use	Flat-rate

c. For charges levied by Internet Service Providers?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Flat-rate	Minutes of Use	Minutes of Use	Minutes of use	Minutes of Use	Flat-rate

1.17 What is the price level and structure charged to connecting to the Internet via leased line?

a. What is the standard list or retail price for a 2 km 2Mbps leased line?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
US$500-1000	_____	<US$500	US$500-1000	<US$500	US$500-1000

b. What is the predominant pricing structure charged by Internet Service Providers to connect via leased line connections?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Flat-rate	Flat-rate	Quantity of data transmitted	Flat-rate	Flat-rate	Flat-rate

Reliability

The following questions will give an indication of the current reliability of the infrastructure network in your economy.

1.18 How many dial-up attempts/connections fail because they are busy or interrupted?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
<1%	_____	>6%	Information not available.	<1%	5-6%

1.19 How often are local websites and/or addresses inaccessible?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Rarely	_____	Sometimes	_____	Rarely	Sometimes

1.20 How high is the rate of packet loss?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
<5%	_____	<5%	_____	<5%	<5%

Availability of terminal equipment

The following questions will give a perspective of whether the lack of availability of terminal equipment is an impediment to the growth of e-commerce in your economy.

1.21 What proportion of the population has access to PCs – through the home or from school or work?

Peru	Malaysia	Indonesia	Hong Kong,China	Chinese Taipei	Thailand
21-30%	>30%	<5%	58.8%	>30%	11-20%

1.22 What percent of the population has a PC at home?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
11-20%	_____	<5%	70.1%	>30%	11-20%

1.23 TVs as percent of the population?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
>60%	>60%	<30%	55%	>60%	>60%

1.24 Mobile / cell phones as percent of the population?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
11-20%	>30%	5-10%	125%	>30%	>30%

Infrastructure Market Conditions

The questions below are intended to give an indication of whether the market conditions for infrastructure services and terminal equipment are likely to have a favorable effect on the uptake of electronic commerce.

1.25 How would the market for basic telecommunications infrastructure be best characterized?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Open and effective competition	Multiple licensed companies	Multiple licensed companies	Open and effective competition	Multiple licensed companies	Multiple licensed companies

1.26 How is the market for basic telecommunications infrastructure regulated?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
There is a truly independent regulator for basic telecommunications	There is a truly independent regulator for basic telecommunications	There is a clear separation between the telecommunications	There is a truly independent regulator for basic telecommunications	There is a truly independent regulator for basic telecommunications	There is a truly independent regulator for basic telecommunications

services. There is a clear separation between the telecommunications operator and regulator. The regulator has the authority to enforce pro-competitive principles regarding interconnection, and unbundling of network infrastructure, and other regulatory safeguards to prevent abuse of market power	services. There is a clear separation between the telecommunications operator and regulator. The regulator has the authority to enforce pro-competitive principles regarding interconnection, and unbundling of network infrastructure, and other regulatory safeguards to prevent abuse of market power	operator and regulator. However, the regulator has limited real authority to prevent the abuse of market power.	services. There is a clear separation between the telecommunications operator and regulator. The regulator has the authority to enforce pro-competitive principles regarding interconnection, and unbundling of network infrastructure, and other regulatory safeguards to prevent abuse of market power	services. There is a clear separation between the telecommunications operator and regulator. The regulator has the authority to enforce pro-competitive principles regarding interconnection, and unbundling of network infrastructure, and other regulatory safeguards to prevent abuse of market power	services. There is a clear separation between the telecommunications operator and regulator. The regulator has the authority to enforce pro-competitive principles regarding interconnection, and unbundling of network infrastructure, and other regulatory safeguards to prevent abuse of market power

1.27 To which extent does the government adopt international principles that facilitate the development of global services, and ensure a level playing field for all providers?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Made full and immediate market-opening commitment under WTO Basic Telecom Agreement. Complete adoption of regulatory principles.	Made market-opening commitment under WTO Basic Telecom Agreement, but with certain limited exceptions in scope of services or timing. Regulatory principles fully adopted.	Made market-opening commitment under WTO Basic Telecom Agreement, but with certain limited exceptions in scope of services or timing. Regulatory principles fully adopted.	Made market-opening commitment under WTO Basic Telecom Agreement, but with certain limited exceptions in scope of services or timing. Regulatory principles fully adopted.	Made full and immediate market-opening commitment under WTO Basic Telecom Agreement. Complete adoption of regulatory principles.	The economy made market-opening commitments under the WTO Basic Telecom Agreement (or equivalent), but maintained substantial exceptions regarding the scope of services or the timeframe. Only limited adoption of the regulatory principles.

1.28 Has your economy acceded to the WTO Information Technology Agreement to enable optimal market conditions and prices for terminal equipment?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Implementing ITA with delays	Implementing ITA with delays	Implementing ITA with delays	Fully implemented ITA	Fully implemented ITA	Implementing ITA with delays

1.29 Does your economy allow foreign providers to participate in the market of wireless communication services?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
No discrimination between local and foreign providers.	Individual licensing requirements with discrimination against foreign vendors.	Individual licensing requirements with discrimination against foreign vendors.	No discrimination between local and foreign providers.	Ans: According to the Telecommunications Act, basically all telecom service providers shall get telecom licenses before they provide services. In other words, at present all the service providers are domestic, and there is no foreign provider in our telecom market. However, in order to introduce Mobile Satellite Services, there is an exception written in the "Administrative Regulations on Satellite Communication Services". I.e. if a	No discrimination between local and foreign providers.

				foreign Mobile Satellite Service provider could find a domestic Type I operator operating satellite or international business as a partner and could use the domestic operator's name to provide the service, then the foreign provider is allowed to participate in the market of Mobile Satellite Services	

1.30 Is licensed spectrum used for Internet access in your economy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Yes	Yes	Yes	Yes	No	Yes

1.31 How many spectrum bands are being used for Internet access?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Few	Many	Few	Many	_____	Many

1.32 Is your economy open to foreign investment in wireless telecommunications?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
No discrimination against foreign investment in	Foreign investment allowed, but discriminatory	Foreign investment allowed, but discriminatory	No discrimination against foreign investment in	Ans: Foreign investment is allowed, but total direct	Foreign investment allowed, but discriminatory

wireless services	treatment of foreign investors. **X** **(Subject to Equity conditions)**	treatment of foreign investors.	wireless services.	shareholding by foreigners shall not exceed 49%, and the sum of direct and indirect shareholding by foreigners shall not exceed 60%	treatment of foreign investors.

1.33 How many licensees are there in your economy in the

a. Cellular network?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Few	Few	Many	Many	Many	Few

b. PCS network?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Many	N/A	Many	Many	Many	Few

c. Packet data network?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Few	Many	Few	Many	_____	One

Interconnection and interoperability

Many of the benefits of electronic commerce stem from its global nature. To maximize its potential, networks need to be fully interoperable, and interconnection needs to be guaranteed.

1.34 Standards:

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Government imposed, mainly open standards with little industry participation in their development.	Open standards limited to those necessary to assure network integrity, protect health and safety, and protect the environment. Standards voluntary and industry-led	Open standards limited to those necessary to assure network integrity, protect health and safety, and protect the environment. Standards voluntary and industry-led	Open standards limited to those necessary to assure network integrity, protect health and safety, and protect the environment. Standards voluntary and industry-led	Open standards limited to those necessary to assure network integrity, protect health and safety, and protect the environment. Standards voluntary and industry-led	Open standards limited to those necessary to assure network integrity, protect health and safety, and protect the environment. Standards voluntary and industry-led

1.35 To which extent is the interoperability of networks enabling user choice?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Users able to choose between variety of fixed line and mobile infrastructure	Users able to choose between variety of fixed line and mobile infrastructure	Users able to choose between variety of fixed line and mobile infrastructure	Users able to choose between variety of fixed line and mobile infrastructure	Users able to choose between variety of fixed line and mobile infrastructure	Users able to choose between variety of fixed line and mobile infrastructure

providers	providers.	providers.	providers.	providers.	providers.

2. Access to Necessary Services

The adoption of electronic commerce will also depend on the capacity, availability and pricing of value-added services which provide applications such as access to the basic infrastructure, and content hosting.

2.1 What is the capacity of access services available to most users in your economy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
>1 Mbps	129Kbps-1Mbps	57-128 Kbps	>1 Mbps	>1 Mbps	129Kbps-1Mbps

2.2 What is the average capacity of access for most ISPs?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Dedicated/Burstable T1 (1.5 Mbps)	T3 Octet Stream (46 Mbps)	Dedicated 56Kbps leased lines	T3 Octet Stream (46 Mbps)	Dedicated/Burstable T1 (1.5 Mbps)	ISDN (64 kbps/128kbps) Dedicated/Burstable T1 (1.5 Mbps)

2.3 What types of services are available to large business users to access the Internet?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Leased lines or dedicated access channels <1.5 Mbps available for most users	Most users can obtain symmetric bandwidth services >1.5 Mbps	Need to build own network to connect to backbone within region	Most users can obtain symmetric bandwidth services >1.5 Mbps	Most users can obtain symmetric bandwidth services >1.5 Mbps	Leased lines or dedicated access channels <1.5 Mbps available for some users

2.4 Is non-telephone or non-wireline access available to business users to enable Internet connection?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	YES	YES	YES	YES

2.5 How would you describe the market for Internet Service Providers (ISPs) in your economy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Several providers offering individual and business access services.	Several providers offering individual and business access services.	Several providers offering individual and business access services.	Large number of providers offering access, content and other services. Range of prices and speeds available.	Large number of providers offering access, content and other services. Range of prices and speeds available.	Large number of providers offering access, content and other services. Range of prices and speeds available.

2.6 How restricted is the market for ISPs in your economy?

a. From the ISP perspective:

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Competitive ISP market, interim rules regarding inter-connectivity	ISPs subject to class license requirements	ISPs subject to individual license requirements	ISPs subject to individual license requirements/ISPs subject to normal competition rules	ISPs subject to individual license requirements	ISPs subject to individual license requirements

b. From the customer perspective

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Customers enjoy full freedom to choose ISP, access network and types of service.	Customer free to choose ISP and pricing policy, but no choice between alternative access networks.	Customers enjoy full freedom to choose ISP, access network and types of service.	Customers enjoy full freedom to choose ISP, access network and types of service.	Customers enjoy full freedom to choose ISP, access network and types of service.	Customers enjoy full freedom to choose ISP, access network and types of service.

2.7 To what extent do ISPs enjoy equal access to network facilities, at the same rates, terms and conditions as those utilized by telecommunication companies themselves, for the provision of their own competing ISP services?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Same rates and terms and conditions	Same rates and terms and conditions	Similar terms and conditions	Similar terms and conditions	Same rates and terms and conditions	Similar terms and conditions/ Same rates and terms and conditions

2.8 Is access provided to elements of the system in an unbundled fashion (i.e. without being tied to purchase of other services from the network provider?)

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	YES	Subject to market and commercial negotiations, information not readily available.	YES	YES

2.9 Is local content widely available?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Local content industry booming. Both private and public sectors have an important presence on the Net	Market for local and local language content developing rapidly.	Government provides virtually the only local content/local language content available.	Local content industry booming. Both private and public sectors have an important presence on the Net	Market for local and local language content developing rapidly.	Local content industry booming. Both private and public sectors have an important presence on the Net

2.10 What is the availability for end user organizations of skilled IT support in the form of service provider businesses and contractors?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
A wide and sophisticated range of services is available at world competitive prices.	A wide and sophisticated range of services is available at world competitive prices	Little commercial availability of IT support services. Firms are dependent on own resources.	A wide and sophisticated range of services is available at world competitive prices.	Services becoming more widespread and affordable but lack sophistication in application of latest technologies	Services becoming more widespread and affordable but lack sophistication in application of latest technologies./ A wide and sophisticated range of services is available at world competitive prices.

Non-IT Services and Distribution Channels

The following question is designed to determine how ready the physical infrastructure in your economy is for the development of electronic commerce.

2.11 Which description most adequately reflects your distribution environment?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Private delivery services available as alternative to traditional postal service. Roads to most locations in good condition. Regular and continuous door-to-door air express and airfreight services.	Delivery services widely available. Airfreight well developed. Cities and towns well connected by highways and/or secondary roads. Sophisticated, specialized, distribution services	Postal services well developed. Main cities linked by reliable road infrastructure Door-to-door air express and airfreight services regular though still infrequent	Delivery services widely available. Airfreight well developed. Cities and towns well connected by highways and/or secondary roads. Sophisticated, specialized, distribution services	_____	Private delivery services available as alternative to traditional postal service. Roads to most locations in good condition. Regular and continuous door-to-door air express and airfreight services.

2.12 Have the International Express Carriers Conference Guidelines on handling procedures been adopted and implemented? (The IECC classify shipments into four categories with procedures for each: (1) documents; (2) low value non-dutiable consignments; (3) low value dutiable consignments; (4) high value consignments.

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	_____	YES	NO Note: Hong Kong, China is a free port and our handling procedure focuses mainly on the nature of the contents of the shipment rather than the value of the contents of the shipment. The IECC Guidelines, which classify shipment according to its value, are therefore not applicable.	_____	NO

2.13 Is there a paperless customs environment, in which all documents are transmitted in the form of e-certified images?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO	YES	YES	NO	_____	YES

2.14 To what extent are shipments pre-cleared through EDI, so that shipments are either released or their status is notified at least two hours before arrival?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
25%	N/A	25%	0 Note: At present, air cargo can be pre-cleared through Hong Kong Customs' Air Cargo Clearance System. However, Customs sends out the customs clearance codes to the Cargo Operator upon the arrival of the flight.	_____	0

2.15 Has a deminimis level been established?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
US$100-500	US$100-500	<US$100	No	_____	<US$100

2.16 Does customs operate 24 hours a day, seven days a week?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	NO	YES	_____	YES

2.17 Does e-commerce result in a reduction of physical inspection by Customs?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	NO	YES	_____	YES

2.18 Does export require physical inspection or declaration?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	YES	YES	_____	YES

2.19 If export requires a declaration, will EDI suffice?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	NO	YES	_____	NO

2.20 Are financial institutions allowed to issue credit cards to consumers?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	YES	YES	_____	YES

2.21 Are there financial limits imposed by government on credit card usage?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO	NO	YES	NO	_____	NO

2.22 Do foreign exchange restrictions prevent or restrict consumer purchases from international web sites

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO	NO	YES	NO	_____	YES

2.23 Is the technology infrastructure of commercial financial institutions capable of supporting online authorization and settlement of e-commerce transactions?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	YES	YES	_____	YES

2.24 Do government regulations restrict electronic settlement of e-commerce transactions or the use of electronic payment technologies?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO	NO	NO	NO	_____	YES

3. Current level and type of use of the Internet

3.1 Number of Internet hosts under the domain of your country as a percentage of the population?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
0.6-1.5%	_____	0-0.5%	0.6-1.5% Note: The number of Internet hosts under HKDNR is 103,475 up to 1 Apr 2006 (Source: http://www.hkdnr.hk/eng/stat/index.html). The HK population is 6,970,800 (Source: http://www.censtatd.gov.hk/hong_kong_statistics/statistics_by_subject/index.jsp) Therefore, the answer is about 1.48%	>3%	0-0.5% 1.6-3%

3.2 Number of Internet hosts as percentage of the population (including TLDs weighted by domain registrations)?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
1.6-3%	_____	0-1.5%	Information not available.	>6%	0-1.5% >6%

3.3 What is the estimated number of people who access the Internet per account?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
4-5	4-5	1	1.4% Note: 3.48 million Internet users and 2.52 Internet subscriptions in 2005.		2-3

3.4 What percent of business accesses directly?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
51-75%	_____	26-50%	51-75% Note: The percentage of business accesses Internet directly is 54.7% according to the "Annual Survey on Information Technology Usage and Penetration in the Business Sector" in 2005 (http://www.info.gov.hk/digital21/eng/statistics/download/itsurveysummary2005.pdf)	_____	10-25% 51-75%

3.5 What percentage of users accesses the net from home (vs. work)?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
10-25%	_____	<10%	>75% Note: According to the "2005 Household Survey on IT Usage and Penetration", percentage of persons aged 10 and	>75%	10-25% 26-50%

			over who had used Internet service via non-mobile web device at least once a week in the past twelve months by place of using Internet service - at home 89.6% - at place of work 39.9%		

3.6 How many Internet sites have secure socket layer (SSL) with third party certification (indicator of electronic commerce)? Secure web servers per 100000 inhabitants:

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
>6	_____	1-2	Information not available. According to the "Report on 2005 Annual Survey on Information Technology Usage and Penetration in the Business Sector" : Of the 2,968 establishments having provided authentication and/or secure access for the clients, 32.3% had used SSL.	_____	1-2 3-4

3.7 Are there any Secure Electronic Transaction (SET) and/or Secure electronic Commerce Environment (SECE) services offered or undergoing tests?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	YES	YES	YES Note: There is secure Electronic Transaction services offered in HK.	_____	NO

3.8 The type of use of the Internet becomes more sophisticated, as consumers grow more confident in electronic commerce. For which purpose do individual users in your economy use the Internet?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Random surfing	_____	Catalogue/lookup info on products	E-mail/Random surfing/ Catalogue/look up info on products/ Low value transactions (e.g. book)	Random surfing	Random surfing/ Low value transactions (e.g. book)

3.9 At the first stage of Internet use, the demography of the group of users tends to be quite homogeneous, consisting mainly of males between 10 and 35 years old. As Internet use becomes more widespread, the proportion of this group of users tends to decline. What proportion of the people who access the web in your economy are NOT men between 10 and 35?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
10-25%	_____	26-50%	26-50%	10-25%	10-25% 51-75%

3.10 How does the government use Internet technologies?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
+On-line Publishing and information provision	+Transforming government or E-Government	+Transforming government or E-Government	Basic internal use for communication and information research/+On-line Publishing and information provision/+Provision of services to the public and e-procurement/+Transforming government or E-Government	+Transforming government or E-Government	Basic internal use for communication and information research/+Transforming government or E-Government

3.11 What percent of businesses uses the Internet in your economy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
10-25%	26-50%	26-50%	54.7%	_____	10-25% 51-75%

3.12 For which purposes does the business community in your economy use the Internet?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Marketing communication customer support	Total Business transformation	_____	E-mail/basic communication/ +Marketing communication customer support/ +Basic tool for sales function, work organization and form processing/ Electronic commerce	_____	E-mail/basic communication Electronic commerce

4. Promotion and Facilitation Activities

A key means of facilitation is through the promotion and use of technical standards. The means and processes by which these standards are implemented and adopted have a significant effect on facilitating electronic commerce.

4.1 Assessment of the level of e-commerce awareness/network literacy: What is the proportion of people who access the web who are not students, academics or active in the Information Technology (IT)/Communications area:

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
10-25%	51-75%	26-50%	<10%	_____	10-25% 26-50%

4.2 Is your economy taking initiatives to raise awareness and disseminate best e-commerce practice among Small and Medium Enterprises (SMEs)?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Several larger projects	The government has adopted and is implementing an ambitious integrated program	The government has adopted and is implementing an ambitious integrated program	The government has adopted and is implementing an ambitious integrated program	_____	The government has adopted and is implementing an ambitious integrated program

4.3 Are any studies or agencies gauging the effects of e-commerce on employment - both job creation and dislocation?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
YES	NO	YES	NO	_____	YES

4.4 Any initiatives underway or planned to address retraining or social implications of the Internet on the workplace (this includes the positive effects of telecommuting, more flexibility and new entrepreneurship as well as issues of job dislocation)?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Small, isolated initiatives	Small, isolated initiatives	The government has adopted and is implementing an ambitious integrated program	The government has adopted and is implementing an ambitious integrated program	_____	Small, isolated initiatives/ The government has adopted and is implementing an ambitious integrated program

4.5 What is your economy's policy with regard to standards?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Encourage industry led standards development. Accept de facto standards. No safeguard against abuse of proprietary de facto standards.	Encourage industry led standards development. Accept de facto standards. No safeguard against abuse of proprietary de facto standards.	Encourage industry to cooperate internationally for the development and adoption of global, open standards Competition policy	Encourage industry led standards development. Accept de facto standards. No safeguard against abuse of proprietary de facto standards.	_____	Encourage industry to cooperate internationally for the development and adoption of global, open standards Competition policy safeguards the abuse of proprietary standards.

4.6 Is there a targeted public budget (Universal Service plan) that helps the needy pay for local phone calls, without creating market distortions?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Universal access addressed by intervening in the market	Public budget administered in a competitively neutral manner	Public budget administered in a competitively neutral manner	Public budget administered in a competitively neutral manner	Public budget administered in a competitively neutral manner	Universal access addressed by intervening in the market

4.7 Does your economy support the development of adaptive technologies (e.g. touch screens, special keyboards, speech technologies, etc.) for electronic commerce, to alleviate the isolation and increase the independence of people with physical or cognitive disabilities?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Small, isolated initiatives	Yes, an ambitious integrated program	Several larger projects	Several larger projects	_____	Small, isolated initiatives/ Yes, an ambitious integrated program

4.8 What is the extend of independent sources of advice to users and consumers?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Government is working with business to encourage the setup of independent sources of advice. Some independent organizations are emerging.	Government is working with business to encourage the setup of independent sources of advice. Some independent organizations are emerging. Independent sources of advice exist on-line an off-line which enable evaluation and comparison. Independent user organizations are active	Government is working with business to encourage the setup of independent sources of advice. Some independent organizations are emerging.	Independent sources of advice exist on-line an off-line which enable evaluation and comparison. Independent user organizations are active.	_____	Government is working with business to encourage the setup of independent sources of advice. Some independent organizations are emerging.

4.9 What is the current year-to-year growth rate in number of Internet users in your economy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
21-35%	5-20%	5-20%	<5%	_____	5-20%

5. Skill and Human Resources

Developing the necessary skills in society through schools, higher education, on-the-job training and adult education will be essential for the citizens of an economy to be able to participate in, and benefit from, electronic commerce.

5.1 What proportion of schools has access to the Internet?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
<30%	>90%	<30%	>90%	>90%	<30% 30-50%

5.2 Schools and other educational institutions have a special role to play in providing students (and parents) who do not necessarily have access to a computer and/or the communications network at home with access to the networked world. Is your economy taking initiatives to increase access of schools to the Internet?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Small, isolated initiatives	Yes, an ambitious integrated program	Several larger Projects	Several larger Projects	Yes, an ambitious integrated program	Yes, an ambitious integrated program

5.3 Is your economy taking initiatives to integrate the Internet and e-commerce in its education and training policy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Small, isolated initiatives	Small, isolated initiatives	Several larger projects	Yes, an ambitious integrated program	Yes, an ambitious integrated program	Small, isolated initiatives/ Several larger projects

5.4 Do schools and educational institutions have access to the most recent technology and technological applications?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Most universities	Yes, most schools and educational institutions	Most universities and higher education institutions	Yes, most schools and educational institutions	Yes, most schools and educational institutions	Most universities and higher education institutions

5.5 Is the education system being reviewed to take advantage of the most recent technology and technological applications?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Only for specific distance learning needs	Yes, both to improve student engagement and enhance teachers' skills	To facilitate learning by students and give them greater access to the world's knowledge base	Yes, both to improve student engagement and enhance teachers' skills	Yes, both to improve student engagement and enhance teachers' skills	To facilitate learning by students and give them greater access to the world's knowledge base Yes, both to improve student engagement and enhance teachers' skills

5.6 Is there close cooperation in your country between educational institutions and businesses to develop up-to-date curricula?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Only cooperation on an ad-hoc basis for specific programs	Yes, as an integral part of the education policy	Only cooperation on an ad-hoc basis for specific programs	For higher education only	Yes, as an integral part of the education policy	Only cooperation on an ad-hoc basis for specific programs Yes, as an integral part of the education policy

5.7 What percent of schools have some computer/IT education as part of the curricula?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
26-50%	>75%	1-25%	>75%	>75%	26-50% 75%

5.8 Electronic commerce has a major impact on human resources by facilitating the internationalization of businesses and increasing the mobility of workers. Does your country have regulatory barriers that restrict the free movement of workers, by setting country-specific requirements and avoiding mutual recognition?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Only restrictions remaining in very specific sectors.	Only restrictions remaining in very specific sectors.	General restrictions minor, but specific regulations restricting access in most sectors.	No restrictions; or mutual recognition agreements for the recognition of foreign qualifications.	_____	General restrictions minor, but specific regulations restricting access in most sectors. Only restrictions remaining in very specific sectors.

5.9 Electronic commerce also facilitates the distance provision of services. This can help stem rural exodus and increase the integration of distant areas, and allows a more efficient use of global resources and expertise. Does your country have regulatory barriers to the free provision of services across borders?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Only restrictions in very specific sectors	Only restrictions in very specific sectors	General restrictions minor, but specific regulations for most sectors.	No restrictions or mutual recognition agreements for the provision of services by providers located abroad.	_____	Yes, establishment is required to provide services No restrictions or mutual recognition agreements for the provision of services by providers located abroad.

6. Positioning for the Digital Economy

Government decisions can act as a stimulant, or as a significant inhibitor. Traditional heavy handed regulation is too rigid to support the speed of technology and market developments that characterize electronic commerce. Industry self-regulation can provide a flexible and effective alternative to government regulation.

6.1 Is your economy promoting industry self-regulation to address e-commerce policy issues?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Industry is consulted before the government acts.	Industry is consulted before the government acts.	Industry not encouraged to participate in policy-making	Industry self-regulatory solutions considered as primary part of Internet policy	_____	Industry not encouraged to participate in policy-making Industry self-regulatory solutions

					considered as primary part of Internet policy

Taxation:

The issues of taxation in the on-line world are many and complex. Technological solutions will help governments address some of these. However, governments must also ensure that electronic commerce is not put at a disadvantage compared to traditional commerce by additional taxation.

6.2 General Taxation Principles

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Government has not yet developed a clear policy regarding the fiscal treatment of e-commerce. Taxation principles are consistent with internationally agreed principles. Taxation policy transparent, easy to apply and predictable.	_____	Government has not yet developed a clear policy regarding the fiscal treatment of e-commerce. Taxation principles are consistent with internationally agreed principles. Taxation policy transparent, easy to apply and predictable.	Taxation system promotes tax neutrality between on and off-line transactions and taxation policy is consistent with internationally agreed principles.	_____	Government considering the implementation of a tax on electronic commerce. Taxation principles inconsistent with internationally agreed principles. Government has not yet developed a clear policy regarding the fiscal treatment of e-commerce. Taxation principles not fully consistent with internationally agreed principles. Taxation policy not transparent, difficult to apply and unpredictable

6.3 Tariffs on electronic commerce

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
The government openly supports the short-term extension of the WTO Standstill on electronic commerce tariffs.	_____	The government has not yet taken a position re. the extension of the WTO Standstill on electronic commerce tariffs.	The government openly supports the short-term extension of the WTO Standstill on electronic commerce tariffs.	_____	The government openly supports the short-term extension of the WTO Standstill on electronic commerce tariffs.

6.4 Legal Framework:

Legal insecurity can be an important inhibitor to the development of electronic commerce. The great patchwork of different legal environments across the globe is in itself a major source of insecurity, which will need to be overcome by the development of internationally agreed principles.

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
The government is participating in work in international fora such as WIPO, UNCITRAL and OECD to develop internationally coherent and legal principles for electronic commerce, and	The government does not rush into the adoption of new regulation. It is participating in and supporting work in international fora such as WIPO, UNCITRAL and OECD to develop internationally coherent and legal principles for electronic	The government is taking quick regulatory action in isolation, with the aim to control to the maximum extent all the Internet activities that can be accessed from within its geography. It does not aim to coordinate issues of jurisdiction and applicable law with	The government does not rush into the adoption of new regulation. It is participating in and supporting work in international fora such as WIPO, UNCITRAL and OECD to develop	_____	The government is taking quick regulatory action in isolation, with the aim to control to the maximum extent all the Internet activities that can be accessed from within its geography. It does not aim to coordinate issues of jurisdiction and

takes these into account when developing its regulations. Where an international solution has not yet been found, it adopts measures that can still lead to conflict of laws and jurisdiction.	commerce. It has adopted the principle of non-discrimination between on-and off-line transactions, and takes international principles into account when developing its e-commerce policy	other countries.	internationally coherent and legal principles for electronic commerce. It has adopted the principle of non-discrimination between on-and off-line transactions, and takes international principles into account when developing its e-commerce policy Note: The Government all along participates in various international fora, such as WTO, APEC, W3C, ICANN, etc. to discuss various topics including wide range of economic and trade issues. Under the ETO, electronic record and electronic signature have the same legal		applicable law with other countries. The government is participating in work in international fora such as WIPO, UNCITRAL and OECD to develop internationally coherent and legal principles for electronic commerce, and takes these into account when developing its regulations. Where an international solution has not yet been found, it adopts measures that can still lead to conflict of laws and jurisdiction.

			status as that of their paper-based counterparts.		

6.5 Electronic authentication:

An appropriate legal framework for electronic commerce also requires the legal recognition of electronic documents and signatures. However, this legal recognition should not be tied to inflexible government regulation or specific technological requirements.

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
The government has adopted regulation to recognize electronic signatures and ensure non-discrimination, but gives special treatment to those that follow a specific technology (e.g. PKI).	The government has adapted its legislation to explicitly ensure non-discrimination between electronic and handwritten documents and signatures.	The government has adopted rules regarding the legal recognition of electronic signatures that are not technology neutral, linking legal recognition to the use of a specific technology (e.g. PKI). Certification Authorities are subject to a licensing regime if their certificates are to be legally recognized. Recognition of signatures from abroad is not implied.	The government has adapted its legislation to explicitly ensure non-discrimination between electronic and handwritten documents and signatures. Note: The ETO accords electronic record and electronic signature the same legal status as that of their paper-based counterparts.	The government has adapted its legislation to explicitly ensure non-discrimination between electronic and handwritten documents and signatures.	The government has adopted regulation to recognize electronic signatures and ensure non-discrimination, but gives special treatment to those that follow a specific technology (e.g. PKI). The government implicitly accepts electronic documents and signatures. No rules or preferences related to any particular technology. Still requirements in legislation requiring hand-

					written signatures or other form requirements for specific transactions.

6.6 Security and Encryption:

Users will not engage in electronic commerce if they have doubts about the security of the information they transfer on line. For different types of transactions and activities, users will want to be able to choose between different types of products/services offering different levels of security.

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Government allows users to choose the most appropriate solution for encryption (incl. strong encryption), no export or import restrictions.	Government allows users to choose the most appropriate solution for encryption (incl. strong encryption), no export or import restrictions.	Government allows users to choose the most appropriate solution for encryption (incl. strong encryption). Only limited trade restrictions.	Government allows users to choose the most appropriate solution for encryption (incl. strong encryption). Only limited trade restrictions.	Government allows users to choose the most appropriate solution for encryption (incl. strong encryption), no export or import restrictions.	Government testing and certification requirements for encryption, which represent an important de-facto restriction on use, production and/or import of encryption.

6.7 Copyright

What is the status of your economy's intellectual property rights legislation and record of IP protection?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
Signed and implemented WIPO Treaties on Copyright and Related Rights	Country has not signed WIPO Treaties on Copyright and Related Rights	Country has not signed WIPO Treaties on Copyright and Related Rights	Country has not signed WIPO Treaties on Copyright and Related Rights Note : Hong Kong is not a signatory to the WIPO Treaties on Copyright and Related Rights, which are open to sovereign states only. Nonetheless, we have already incorporated into our Copyright Ordinance the essential provisions on the protection of copyright in the digital environment.	_____	Country signed but not implemented WIPO Treaties on Copyright and Related Rights Signed and implemented WIPO Treaties on Copyright and Related Rights

6.8 Liability

What is your economy's approach to liability? Is liability relief contemplated for ISP/access providers - notice takedown solutions?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO APLICA	Balanced liability solutions limiting ISP responsibility combined with an effective system of notice takedown solutions for ISPs.	Balanced liability solutions limiting ISP responsibility but systematic control requirement.	Balanced liability solutions limiting ISP responsibility but systematic control requirement.	_____	ISPs responsible for all Internet content carried. Extensive control requirements. Balanced liability solutions limiting ISP responsibility combined with an effective system of notice takedown solutions for ISPs.

6.9 Content:

Very strict content control regulations will have an adverse effect on electronic commerce. ISP self-regulation combined with user-empowering technologies will provide a balanced and flexible solution to content control.

Which situation best describes your economy's approach to content?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO APLICA	Effective system of self-regulation complemented by user-empowering technologies.	Balanced liability solutions limiting ISP responsibility or systematic control requirement.	Effective system of self-regulation complemented by user-empowering technologies.	_____	ISPs responsible for Internet content carried. Balanced liability solutions limiting ISP responsibility or systematic control requirement.

6.10 Privacy:

Strict regulatory solutions that do not recognize different systems (self-regulation, contractual solutions, etc.) of privacy protection will cause barriers to electronic commerce.

Which situation best describes your country's approach to privacy?

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
NO APLICA	N/A	Established self-regulatory system for privacy protection, based on self-regulatory codes and/or seal programs.	Companies well aware of privacy issue, most companies publish their privacy policy on their website - Light-handed or no involvement government.	_____	Strict government rules or standards for privacy protection with little involvement industry for their development and/or enforcement. Companies well aware of privacy issue, most companies publish their privacy policy on their website - Light-handed or no involvement government.

6.11 Consumer Confidence:

Peru	Malaysia	Indonesia	Hong Kong, China	Chinese Taipei	Thailand
An independent agency dedicated to the oversight and redress of	A variety of industry initiatives (e.g. codes of conduct, accreditation	Traditional geographically determined government	A variety of industry initiatives (e.g. codes of conduct, accreditation systems, etc. are in	_____	An independent agency dedicated to the oversight and redress of

consumer protection complaints is established. Industry has started to develop self-regulatory mechanisms such as accreditation systems etc.	systems, etc. are in place to enhance consumer confidence. Alternative dispute resolution and/or mediation mechanisms are available for resolving consumer complaints. Plus existing legislation. No independent agency.	regulations are the only measures to protect consumers in electronic commerce transactions.	place to enhance consumer confidence. Transparency in the market is enhanced by independent agencies/companies dedicated to making and publicizing market evaluations. Alternative dispute resolution and/or mediation mechanisms are available for resolving consumer complaints.		consumer protection complaints is established. Industry has started to develop self-regulatory mechanisms such as accreditation systems etc.