

E-Commerce in Southeast Asia: A Review of Developments, Challenges and Issues

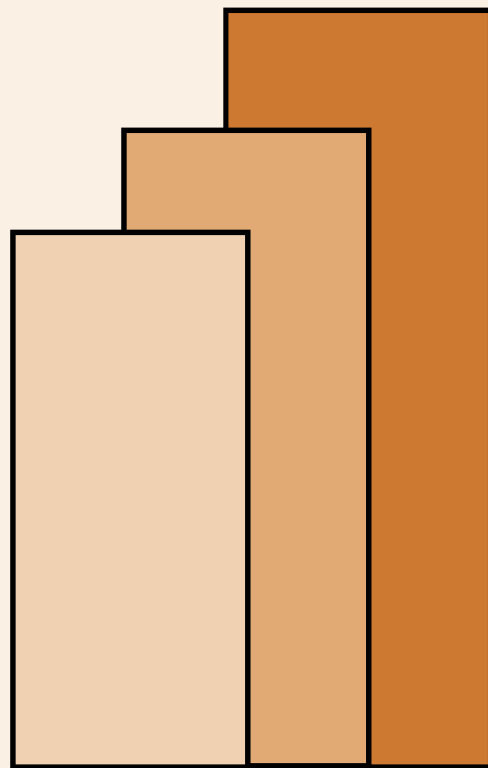
Aniceto C. Orbeta, Jr.

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For comments, suggestions or further inquiries please contact:

The Research Information Staff, Philippine Institute for Development Studies
3rd Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines
Tel Nos: 8924059 and 8935705; Fax No: 8939589; E-mail: publications@pidsnet.pids.gov.ph
Or visit our website at <http://www.pids.gov.ph>

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Aniceto C. Orbeta, Jr.
Philippine Institute for Development Studies
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Abstract

This paper reviews the developments, challenges and issues in e-commerce in Southeast Asian countries. Given its implications for public policy, it focuses on e-commerce using the Internet. The review covers the developments in transaction values, the state of infrastructure (communication systems, payment systems, distribution and delivery systems), socioeconomic, cultural and legal environment and the regional and national initiatives. It also discusses the benefits and impacts as well as the emerging challenges and issues in e-commerce using the Internet. It then summarizes by identifying the main opportunities and challenges in e-commerce for countries in the region.

Keywords: Electronic Commerce, Information and Communication Technologies,
Electronic Government, Internet, Southeast Asia

E-Commerce in Southeast Asia: A Review of Developments, Challenges and Issues*

Aniceto C. Orbeta, Jr.**

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A. Introduction

In 1998 Andy Grove, Chairman of Intel, was quoted as saying that “in 5 years all companies would be Internet companies or they won’t be companies at all.” While this may be an optimistic forecast, it is very difficult to ignore the fact that the growth of the Internet is exceeding forecasts. For example, the International Data Corporation (IDC) predicted a few years ago that the number of Internet users would reach 320 million by 2002.¹ The last count by Nua Internet Surveys² in July 2000, however, revealed that the number of on-line population is already 359.8 million. With this explosive growth, it is no longer possible to ignore the Internet. In fact, some even have the opinion that the Internet has the capacity to change anything (The Economist, February 2000³). Considering its explosive growth, it has become a very attractive platform for conducting business. Accompanying this real opportunity, however, are serious challenges. This paper reviews the developments, challenges and issues in e-commerce using the Internet and with particular focus on its implications for ASEAN countries.

Up to the present, there is no universally accepted definition of e-commerce (Mann, et al. 2000). OECD (1997a) and OECD (1999) provide a list of the various definitions. The most practical definition is given by Mesenbourg (1999) who defined e-commerce as “the transactions completed over a computer-mediated network that involves the transfer of ownership or rights of use of goods and services.” The definition is comprehensive as well as restrictive. It is comprehensive because it will include transactions such as those using the Automatic Teller Machine (ATM) and Electronic Data Interchange⁴ (EDI) using proprietary protocols and private lines but it is also restrictive because it requires change in ownership or rights of use excluding many partially computer-mediated transactions. As such, doing online transactions is not very new. What is new is the use of the Internet, a public network, as a platform where customers directly deal with producers/sellers and/or intermediaries offering a wide range of goods and services.

The widespread use of the Internet came with the introduction of the browser in 1994. With the introduction of the browser, the Internet, which used to be a limited network for

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** Senior Research Fellow, Philippine Institute for Development Studies. Email: aorbeta@pids.gov.ph.

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¹ “IDC’s Internet Commerce Market Model Predicts Buyers on the Web Will Increase Nearly Tenfold by 2002” (<http://www.idcresearch.com/F/HNR/08179ahn.htm>)

² http://www.nua.ie/surveys/how_many_online/.

³ “The Net Imperative,” The Economist, 26 June 1999.

⁴ It has been argued (e.g. OECD 1999) that these transactions should not be included because since these are private transactions between businesses using proprietary protocols, these are of limited public concern.

research institutions mainly in the US,⁵ became the infrastructure for user-friendly communication for a very fast growing number of people worldwide. The Internet became effectively available to everybody and not only to geeks. This led to the phenomenal growth of interconnected servers, and individuals connected through those servers. With this growth, the value of being connected to the Internet surged following Metcalfe's Law which says that the "value of a network increases exponentially with each additional node."⁶ With the growth of the Internet, it became a viable platform for doing e-commerce as well.

Given the widespread use of the Internet, not only is business looking at it as a platform for electronic transactions, governments are also starting to use it for delivering services or doing electronic procurement. This brings to three primary groups of actors that will be doing transactions over the Internet, namely: Business (B), Consumers (C) and Government (G). This would mean nine buying and selling transactions cells between these actors. Table 1 shows this matrix with some examples of applications using the Internet.

However, as pointed out by the Sacher Report, business transactions are only conducted after a certain level of threshold of trust is attained (OECD 1997b). For e-commerce to flourish, it has been argued that players should have achieved the level of confidence accorded to over the counter transactions. Producing this level of trust on e-commerce using the Internet as a platform, poses considerable challenge to governments and societies. EDI transactions using proprietary protocols and over private lines and involving a limited number of players, is relatively easier to handle. By keeping the network "closed," EDI has removed much of the problem that the Internet spawns when used as a platform for business transactions.

The paper is organized as follows. The next section present development and initiatives in the area of e-commerce worldwide and ASEAN in particular. The third section will outline the benefit and impact of e-commerce. The fourth section deals with issues and challenges. The last section provides a summary.

B. Developments and Initiatives

The description of developments and initiatives in e-commerce will be organized into four areas. First is the development in transaction values. Second is the development on the infrastructure aspects. Third is the economic, social and legal environment. Fourth is the initiatives undertaken by governments.

⁵ A good introduction to the history of the growth of the Internet is given in Shapiro and Varian (1997). "The Economic FAQs About the Internet." In L. McKnight and J. Bailey (1997). Internet Economics. (can also be found in <http://www-personal.umich.edu/~jmm/papers/FAQs/econ-faqs-mit96-net.pdf>).

⁶ After Bob Metcalfe former CEO of 3Com and inventor of the "Ethernet" networking technology. Paul Krugman ("Networks and Increasing Returns: A Cautionary Tale," <http://web.mit.edu/krugman/www/metcalfe.htm>) argues that the explosive growth will not happen forever because the profitability of connecting each node will not be the same which the Metcalfe Law implicitly assumes. He then argued that against Metcalfe's Law must be set DeLong's Law which states that in building a network the more profitable nodes will most likely be connected first.

Trends in Transaction Value⁷. Forrester Research predicted that e-commerce revenues⁸ will grow to 6.7 trillion US\$ in 2004 or about 8.6% of total sales (Table 2). In Asia/Pacific this will be 1.6 trillion US\$ or 8% of total sales in 2004. In addition, Asia/Pacific is expected to exhibit higher growth rates of 86.5% compared to the world's 58.4%. There are several patterns can be gleaned from these figures. One is the a US-centric geographic distribution of the transactions value with the US accounting for almost three-fourths (74%) in 2000. This dominance, however, is expect to decline to less than half (47%) by 2004⁹. Another feature that has been pointed out by OECD (1999) as evident in immediate past trends is that even if e-commerce is growing very rapidly, it is still at its embryonic stage. For example, in 1996/97 it is only 3% of credit card purchases and 2% of direct purchases. For the whole of OECD countries this is just 0.5% of total retail sales. By 2003/05, this proportion will increase to 54% of US credit card sales and 42% of direct purchases and 15% of total retail sales in OECD countries (Table 3). So that even in countries where large online transaction values are expected, it is still relatively small when compared to common benchmarks. In addition, Table 2 shows that even by 2004 e-commerce will only amount to only 13% of total sales in the US and 8.6% in the world.

Still another feature of current e-commerce is that even if B2C is growing at phenomenal rates, currently it is still heavily dominated by B2B transactions (OECD 1999). Table 4 shows the estimated relative size of the B2B relative to B2C transactions in 1995-1997. Almost all of these are done using proprietary protocols and private lines EDI. The Economist predicted that once these big players are convinced that the Internet has become a secure and reliable alternative and big business transfer their transactions to the Internet, this will have a tsunami effect on transactions values flowing through the public Internet (The Economist, 26 June 1999¹⁰).

There is almost no estimate of the transaction values for ASEAN countries except the estimate given by GS Research and IDC for 2005 which puts the value at 11 billion US\$ for Singapore, Thailand and Indonesia, 10 billion US\$ for Malaysia and 7 billion US\$ for the Philippines (FEER, Aug 24, 2000). Of course, there is no indication that the pattern mentioned earlier will not hold for for ASEAN countries.

Finally, it should be mentioned that currently a substantial proportion of the websites is not yet equipped with online payment systems but only provide information on products which can then be purchased using orders via telephone or fax or normal over the counter transactions. This can be inferred from the low proportion of the hosts that employs encrypted transactions that will be described later.

Infrastructure Trends. Mann, et al. (2000) identified three infrastructure systems on which the growth of e-commerce depend. These are: (1) communications systems; (2)

⁷ OECD (1999) admonishes that estimates provided by private market research and consulting firms has to be taken with caution because they may have the incentives to give overoptimistic values (Box 1.2).

⁸ It must be noted that revenues is a not a very good indicator of the financial importance of a sector because it is prone to double counting. Value added is less prone to double counting (Haltiwanger, et. al. 1999).

⁹ Another similar projection is given by the IDC which predicts that the US share will go down to 44% by 2003 from 62% in 1999.

¹⁰ "The real revolution," The Economist, 26 June 1999.

financial payment systems; and (3) distribution and delivery systems. Only when these systems are dependable and safe will conducting business electronically flourish.

Communications Infrastructure. The ease of online ordering depends on the state of the communications infrastructure. In examining the developments in the communication infrastructure for e-commerce, it is useful to organize this from the sellers and buyers points of view. From the sellers' point of view, one would look at servers from where goods and services can be offered. It is often argued that the number of secured servers -- those that use encrypted transactions over the web -- is a much better indicator because these are more likely to be used for business purposes. Of course, it must be noted that this underestimates the actual number of servers used for e-commerce because this does not include the hosts doing EDI which are using proprietary protocols and private lines. Estimates showed unprecedented growth of hosts both throughout the world, in general, and ASEAN, in particular. As of the latest count in July 2000, the Software Consortium's Internet Domain Survey,¹¹ put the hosts count at more than 93 million.¹² It has been growing at more than 50% between 1995 and 2000 (Table 5). In Southeast Asia, the growth rates are even higher than the average world growth rate. Singapore, Malaysia and Brunei lead the other ASEAN countries in terms of number of hosts per 10,000 population (Table 6). In terms of secured servers, Netcraft¹³ does a regular survey of secured servers through its Secure Socket Layer (SSL) Survey. In 1998¹⁴, the proportion of servers is highest in the US with 72%. In ASEAN, Singapore has the highest rates of 0.33% followed by Malaysia at 0.12% (Table 7).

Consumers have several platform options in accessing the Internet. These can either be PCs connected via fixed lines, dial-up connections or cable connections, Web-enabled TV, Web-enabled game consoles, or mobile phones using wireless application protocol (WAP). Infrastructure indicators, then, from the consumer side would include measures of PC ownership, telephone connections, TV ownership, cable connections and, mobile phones. In addition, the number of internet users would also provide an indication of infrastructure availability. Of course, the number of PCs connected to the Internet would be a better measure than the total number of PCs. Similarly, the number Internet users would be a better indicator compared to the total number of computer users. In terms of the online population, the best measure obviously would be proportion that actually do buying or selling in the Internet. Unfortunately, data on this aspect is much more harder to obtain. While hosts connected to the Internet can be probed by a software agent, estimating users need well-designed surveys.

As of the last count of the Nua Internet Surveys¹⁵ in July 2000, the number of online population is 359.8 million or 5.9% of the world population. Again the Asia/Pacific online population is the fastest growing with a CAGR between 1998-2000 of 46% while the average growth for the world is only 31%(Table 8). The PC density per population in

¹¹ <http://www.isc.org/ds/>

¹² It must be noted that this represents a conservative estimate because this does not include hosts behind firewalls.

¹³ <http://www.netcraft.com/>

¹⁴ This is a free sample of the survey result. One has to be a subscriber to the service to get current survey results.

¹⁵ http://www.nua.ie/surveys/how_many_online/.

ASEAN countries is also growing faster than the world average. Leading the pack is Singapore with 46 per 100 inhabitants (Table 5). In terms of dial-up accounts, again Singapore leads the five countries that Pyramid Research provided a forecast. Singapore is expected to have 3.2 million dial-up accounts (86% of the population) in 2004 from 992 thousand (28% of the population) in 2000 (Table 9) the highest density among ASEAN countries. In terms of telephone connections, the highest connection density per 100 population in 1999 is also found Singapore (58%) followed by Brunei (25%) and Malaysia (20%) (Table 10). In term of cellular phones, again the highest density per 100 population is exhibited by the same three countries. Table 11 shows television densities in ASEAN countries. Since cable wiring is currently used to web-enable a TV, cable subscription will an indicator for potential Internet access. Table 12 provides the pattern for cable subscription. Singapore shows the highest proportion (21%) of those who have cable connection among TV owners.

Ultimately, it is the number of users who used the Internet to make a purchase that count. A recent survey done by ACNielsen NetWatch show that this proportion does not go beyond 12% (Hong Kong and Philippines) and go as low as 6% (Taiwan and PRC) (Figure 1). This low percentage reflects the current level of mistrust users have on on-line transactions.

These trends points to a large disparity in communication infrastructure among ASEAN countries.

Payments Infrastructure. Once consumers decide to buy, the next hurdle is whether payments can be made in an orderly, timely and secured manner. The absence of a reliable and secured payments system will render the servers to become mere information booths rather than being venues where business transactions are consummated. Online sales are usually paid for through simple credit cards or with the more advanced “smart” cards. Thus credit card usage rate is an indicator of the potential for growth of e-commerce. It should be noted, however, that this is a weak indicator since credit cards are also used in over the counter transactions. The more fragmented the relationship between consumers, their bills, and the banks that clear the payments, the slower the up take of e-commerce (Mann, et. al (2000)).

Bettoni’s (1999) presentation at the 1999 International Telecommunications Union (ITU) meeting identified four requirements of business in a payment system, namely: (1) confidentiality – to ensure that card and payment information cannot be read by others; (2) integrity – to ensure that information cannot be altered; (3) authentication – to allow cardholder to know if the merchant is valid and to allow the merchant to know if the cardholder has a valid card; and (4) interoperability – that transactions the can be done between vendors, between borders and between brands. It has been claimed that these are addressed the by the Visa / MasterCard Secure Electronic Transactions (SET)¹⁶ protocol.

¹⁶ “Credit card data and a digital certificate (for authentication) is stored in a plug-in to the user's Web browser. The order is received by a SET-enabled merchant server that passes encrypted payment information to the bank. Approval is electronically sent to the merchant “(TechEncyclopedia, <http://www.techweb.com/encyclopedia/>).

From surveys conducted, there are clear indications that is still a considerable fear in doing online transaction. A Yahoo survey points to a very low percentage (5%) of people who trust sending credit card information over the internet when 57% will agree to sending the same information using a public phone (cited in Bettoni, 1999). The China Internet Network Information Center reports that lack of transaction security bothered 30% of the survey respondents and only less than 10% do e-commerce related transactions over the Internet (eMarketer 2000).

Considering the low credit card ownership in Asia, it has been argued that there might be a need for developing a different mode of payment besides a credit card based system (ebusinessforum, 17 April 1999)¹⁷.

Several initiatives in ASEAN countries are underway to provide electronic payments solutions. The emerging model involves a foreign electronic payment company teaming up with a local service provider. For example, PT eSecure Indonesia was launched in April 2000 (Paul Budde Communication 2000). eSecure uses Secured Electronic Transactions (SET) standard designed by Visa and MasterCard. The services include secure applications for credit cards and merchants, a merchant and payment gateway and security application for banks and financial institutions handling payment and financial transactions. In 1998, Telekom Malaysia signed an agreement with Orion Technologies, Inc. (Canada) to provide e-commerce services. The services include web-based electronic trading. In Singapore, the National Computer Systems Pte Ltd., the IT services arm of SingTel, teamed up with internet payments solution company Netlife (Germany) in September 1999 to provide a combined e-commerce and Internet payment solution. Another initiative in Singapore is Commerce Exchange which is a product of the collaboration between the National Computer Board and Visa International. The exchange links companies, suppliers and financial institutions. Still another initiative in Singapore is the Internet based e-cheques. These are online transactions exchanged by e-mail which allow secure direct transfer of payments. Behind the facility is the Network For Electronic Transfers (NETS) composed of 5 largest banks. Together with SingTel, NETS also launched CashCards based on the SmartCard¹⁸ technology. In Thailand, online payment is provided by Bank of Asia to online trading website initiated by the Department of Business Economics of the Commerce Ministry.

Distribution and Delivery Infrastructure. Once the payments are cleared, the next concern is whether the goods are delivered fast and in good shape. The speed of electronic ordering and payment systems will be negated by an inefficient and unreliable delivery system. This will depend on the delivery system. The Economist (February 26, 2000)¹⁹ even argued that the tale-tale sign that e-commerce has taken off is not the number of PC users clicking at their desk but “automated warehouses and thousands of little vans delivering little

¹⁷ “E-Commerce: Asia Online,” ebusinessforum, 17 April 1999. (<http://www.ebusinessforum.com/>).

¹⁸ “A credit card with a built-in microprocessor and memory used for identification or financial transactions. When inserted into a reader, it transfers data to and from a central computer. It is more secure than a magnetic stripe card and can be programmed to self-destruct if the wrong password is entered too many times. As a financial transaction card, it can be loaded with digital money and used like a travelers check, except that variable amounts of money can be spent until the balance is zero” (TechEncyclopedia, <http://www.techweb.com/encyclopedia/>).

¹⁹ “Distribution Dilemmas,” The Economist, 26 February 2000).

packets to households". Thus, e-commerce increases the importance of an efficient delivery system. It has been argued that the dominance of the US in e-commerce, as mentioned earlier, is largely because of a well-developed catalogue sales delivery system (OECD 1999).

Of course, this hurdle does not exist for goods that can be digitally delivered, such as stock trading, software, electronic books, or music in electronic files. It can be argued that this type of goods will dominate e-commerce until the distribution systems become sufficiently reliable and efficient. This is evident in the OECD estimate of the proportion of the trading that will be done online between 2000-20005 (Figure 2). The clear winners are goods that can be delivered electronically like stock trading, paying bills, software, adult entertainment (OECD 1999). Boston Research Group also estimates that the biggest proportion of US online transactions involves computer hardware and software, travel and financial transactions (Economist, Feb 2000). Forrester predicted that digital delivery is be as much as 25% of the Internet purchases (Mann (2000) citing ECommerce Times, 24 January 2000).

One of the distinct contributions of the Internet to the delivery system is the facility to track in real time the movement of ordered goods from source to destination. This has advance by several notches supplier and consumer confidence that goods that has been paid for online is moving toward the intended destination. Not only major international carriers (FedEx, UPS, DHL) have this facility in their websites but also small operators as well.

In another vein, the National Transportation Exchange (NTE)²⁰ of the US exemplifies what the Internet can do to transportation systems. Using the Internet it connects buyers and sellers of transportation capacity. It handles both contracting and payments. By moving it from a proprietary network to the Internet it has extended its reach down to individual lorry drivers who can use wireless Internet access devices to tap into the NTE (The Economist, 26 June 1999²¹).

This early, Forrester Research already expressed doubts that the current delivery system will be able to handle the more than US\$6.8 trillion expected to traded on-line by 2004 (Traffic World, 3 October 2000²²).

To the author's knowledge, this is the area where there is little information in ASEAN countries. Of course, ASEAN businessmen can use major international carriers like UPS, FedEx and DHL for international and to a limited extent local deliveries.

Socioeconomic, Cultural and Legal Environment. Over and above the three infrastructure systems is the social and legal environment within which these activities occur. The Sacher Report (OECD 1997b) argues that commercial transactions are to large extent shaped by social and cultural attitudes.

²⁰ <http://www.nte.net/>.

²¹ "The Rise of Infomediaries," The Economist, 26 June 1999.

²² <http://www.trafficworld.com/news/dailynews/05.html>, 3 October 2000.

One way of characterizing the socioeconomic and cultural dimension of e-commerce is through the level of access and acceptance of electronic transactions by the population. There are several aspects of to this. One, is the affordability of being online. This one is related to the cost of getting online relative to per capita income. It is obvious that connectivity, however defined, is a positive function of the level of income. Another aspect is the level of comfort in doing electronic transactions. This is associated with the level of education and diffusion of the use of the Internet amongst the population.

The state of the communications infrastructure in ASEAN countries described above reflects the extent of connectivity. It is obvious that there are large disparities in access which understandably emanate from disparities in levels of development. Cultural acceptability is much more difficult to measure. But to a large extent, this is dependent on the introduction of information and communication technologies (ICT) in the educational system as well as the leadership government is providing in the use of ICT in its operations. It has been mentioned that Asians, in general, prefer face-to-face transactions and that there is low card ownership (eBusinessForum, 17 April 1999). There is just too many corner convenience stores in this part of the globe to be able to deny this.

Finally, there is the legal environment governing electronic transactions. The ASEAN countries with who have enacted e-commerce related laws include Singapore, Malaysia, and the Philippines. Thailand is on the verge of enacting an e-commerce legislation. Indonesia is also currently working on an e-commerce legislation. E-ASEAN taskforce is predicting that by 2003 all member countries would have UNCITRAL-based e-commerce legislation.

Regional Initiatives. In ASEAN, a regional coordinated effort had been launched with the creation of the e-ASEAN taskforce²³ in November 1999. The taskforce is joint public sector-private sector advisory body composed to representatives from 10 ASEAN member countries. The overall mandate of the task force is develop a comprehensive action plan for ASEAN to plug into the global e-space. The elements of the plan include: (1) Evolving a regional ASEAN Information Infrastructure (AII); (2) Create an E-commerce friendly legal environment; (3) facilitate the freer flow of trade and investment in ICT goods and services within ASEAN; (4) Addressing societal concerns; and (5) Government to lead by example.

The pilot projects proposed by the taskforce include: (i) for e-commerce: Dot Com Incubator, Industry/Business Exchange, ASEANWorld master portal, and regional tradenet; (ii) ASEAN School Network; (iii) e-Entrepreneurship seminar (Romulo, 2000). The important milestones include, for 2001: (1) enhancing interconnectivity and interoperability; begin applying Mutual Recognition Agreements (MRA) on telecoms equipment; and mutual recognition of digital signatures and electronic documents. For 2002, the establishment of a regional payment mechanism. For 2003, begin the implementation of ICT common marketplace and all members would have enacted UNCITRAL-based e-commerce legislation.

²³ <http://www.e-aseantf.org>

National Initiatives. Several significant national initiatives in ASEAN countries have been launched in recent years. Expectedly, some are much more advanced than others.

In Singapore, the almost fully-implemented IT2000 Masterplan is the existing blueprint for using IT in all government departments. It spawned SingaporeOne,²⁴ which was formally launched in June 1996. It aims to deliver a new level of interactive, multimedia applications and services to homes, business and schools throughout Singapore. It promises to go beyond what the Internet can deliver. The plan was to deliver two distinct but integrated levels of information services. The first is the broadband infrastructure of high capacity networks and switches. The second is the advanced applications and services using these high capacity networks. The government is currently preparing to put together ICT21 Masterplan which has the objective of “transforming Singapore into a vibrant and dynamic global ICT (information and communication technologies) capital with a thriving and prosperous net economy by the year 2010.” In terms of applications, the popular eCitizen Center²⁵ has been recognized as the “most developed integrated service delivery in the world” by the America’s General Services Administration (Economist, June 24, 2000). Another application is the GeBiZ²⁶ which aims to be a one-stop-shop for all government dealings. This is expected to be fully operation by the end of the year.

Malaysia, for its part has, launched in June 27, 1998 the Multimedia Super Corridor (MSC).²⁷ It envisioned to create a “perfect global multimedia climate” in 15 kilometers by 50 kilometers strip between Kuala Lumpur City Center to the Kuala Lumpur International Airport. The initial applications include: Electronic government, Smart Schools, Telemedicine, R&D Cluster, Worldwide Manufacturing Webs, Borderless Marketing.

The Philippine IT21²⁸ envisions the country to be the IT human resource center in the region. The poor state of telecommunications infrastructure will continue to be a challenge. The recently passed E-Commerce Act (RA8792), among others, mandates government agencies to use e-commerce solutions in their operations asking them to prepare implementation plans. In July 2000, the government launched the Government Information System Plan (GISP)²⁹ dubbed as the Philippine Government Online. It provides a framework for the utilization of IT in government operations.

Thailand³⁰ is about to finish its E-Commerce Plan by end of October this year (asia.biz.yahoo.com). The existing monopoly of Communications Authority of Thailand (CAT) has been cited a major roadblock in the progress of diffusion of Internet use in Thailand (FEER, Sept 21, 2000). CAT’s response to this criticisms is published on their website.³¹

²⁴ <http://www.s-one.gov.sg>.

²⁵ <http://www.gov.sg/#ecitizen>

²⁶ <http://www.gebiz.gov.sg>

²⁷ <http://www.mdc.com.my/msc/index.html>

²⁸ <http://www.neda.gov.ph/IT21/>

²⁹ <http://www.neda.gov.ph/GISP/>

³⁰ <http://www.ecommerce.or.th/> is the website of the E-Commerce Resource Center. Most of the documents, however, are in Thai including the “Thailand Framework for Electronic Commerce Development.”

³¹ <http://www.cat.or.th>.

Vietnam appears to have similar problems with Thailand regarding the monopoly of Vietnam Posts and Telecommunications (VNPT) of vital international gateways.

C. Benefits / Impacts

It is useful to organize the discussion of the benefits of e-commerce from three points of view, namely: supplier, consumer, and society.

Suppliers. From the suppliers point of view the benefits include: (1) worldwide reach; (2) a 24x7 presence; (3) potential to eliminate intermediaries; (4) updating catalogue in real time and potential personalized offerings; (5) lower transaction costs; and (6) in terms of customer support: order tracking, self-service information retrieval and individualized dialogue (Goelzer,1999).

The elimination of intermediaries is not that clear cut, at least not yet. From Figure 3 the Internet enables all players in the supply chain to deal directly with the final consumers which can lead to disintermediation. Dealing directly with final consumer is the key revolution that the Internet brings to business transactions. Note that the EDI using proprietary protocols and private lines have all the facilities except that it stops short of dealing directly with consumers. The flipside of this, however, is that consumers will be inundated with information so that they would be willing to pay for sorting services. This is what The Economist (June, 1999) dubbed as the rise in “infomediaries.” The popularity of portals, like Yahoo, is testimony to this tendency. It should be noted that this mean greater access to information on preferences of consumers as well at every node in the supply chain.

The lowering of transactions costs is well established. Mann et al. (2000, p59), for example, cited a study a 1997 study done by Booz and Allen which found that transactions over the teller window cost \$1.07, with an ATM \$0.27 and with Internet banking \$0.01. This result was subsequently corroborated by Andersen in 2000. For securities trading, the full-brokerage service charge is \$150 while E*Trade only charges \$10. Finally, OECD (1999) reports substantial impact on distribution costs of e-commerce in the US. For instance, the savings between traditional and internet-based sales for airline tickets will be as much as 87%, 89% for banking, 67-71% for bills payment, 60% for life insurance and 97-99% for software distribution (Table 13).

Given direct contact with consumers, customer relations management is also revolutionized by the Internet. Orders can be tracked in real time so inquires can be answered as accurately with very little effort. Consumers’ questions can be answered individually even without human intervention with well designed online help systems. Finally, the potential for individualized dialogue with customers is greatly enhanced. The rise of offshore call centers (e.g. AOL in Clark, Philippines) where costs are lower is testimony to this trend (FEER, 2 September 1999).³²

³² “At Your Service,” FarEastern Economic Review, 2 September 1999.

Electronic commerce through the Internet provides both lower market entry and transaction costs and the ability to extend geographic reach to a much larger market (Alliance of Global Business 1999). This makes it available for Small and Medium Enterprises. Since the setup cost are low, large volumes are not required to justify putting up a website for even modest size firms. The usual model is availing of rapidly proliferating application service providers for a very small fee.

Consumers. The benefits for consumers include: (1) shopping from the comfort of the home; (2) shopping anytime; (3) access to worldwide choices; (4) access to cost competition; (5) access to marketing information; (5) test of digital products (e.g. music); (6) immediate download of digital products; (7) personalized service; (8) no waiting line; (9) no sales person; (10) intelligent agents to facilitate sale. It has been argued that the “the bargaining power is shifting from sellers to buyers” (Goelzer, 1999).

The virtual shop facilities with intelligent software agents enhances the ability of consumers to browse and choose from a wide range of goods and services and thereby facilitating price comparison. It also facilitates personalized ordering for those who are not very much concerned about the price. Finally, innovative ways of product delivery has also emerged enhancing the ability of consumers to test the product before buying.

Society. OECD (1999) summarizes the economic and social impact of the e-commerce into five broad themes, namely: (1) it transforms the market place; (2) it has a catalytic effect; (3) it vastly increase interactivity in the economy; (4) it is based on openness; and (5) it alters the relative importance of time. These themes reveal the vastness of the impact of e-commerce. Underlying these themes is the increase in interactivity between producers, intermediaries and final consumers brought about by allowing these three to interact with each other directly.

With the aid of intelligent software agents, e-commerce increases the interactivity between producers, intermediaries and final consumers. It is now easier to ask as well as provide information about products and preferences. Servers can also be programmed to record click streams and transactions conducted in its premises. This constitutes a system of low cost generation of important transactions data that will contribute to the understanding consumer preferences. This is expected to enable suppliers to address directly specific market segments that were previously uneconomical. In addition, this will likely spawn new activities that will not only lead to new job creation, but will also result in the demand for new skills (AGB 1999). Furthermore, this means increasing participation of consumers in the design of new products. This represents opportunities for customization to better suit consumer preferences as against standardization that is the trademark of the old economy. Finally, this is expected to breed a culture of openness that is the basic feature of the Internet.

Unfortunately, using a public network also opens up a the proverbial Pandora’s box because the transactors are no longer limited to a small number of producers, suppliers and distributors but now include numerous final consumers as well. For one, without proper

security systems, transactions also become vulnerable to being captured by parties beyond the ones doing the transactions. In addition, consumers may lose some privacy in the process.

There is the concern that e-commerce will usher in a new source of inequity which is popularly called the “digital” divide. From the production side, the Internet provides opportunity for small and medium enterprises to sell their products online which was only available to players dealing in large volumes before. This will mitigate inequalities. From the consumer side, however, the reality is that only those who can afford to own a PC and a telephone line can tap into the Internet unless extensive array of public Internet kiosks are installed. In addition, countries with better telecommunication facilities would have distinct advantage at exploiting the benefits of online transactions.

Another benefit is e-government. There are at least two areas where society can benefit from the use of the Internet in government operations. One is electronic delivery of services. Another is through electronic procurement system. On both aspects, Singapore is the trailblazer not only in this part of the globe but worldwide.

For ASEAN, all of these effects should also apply. However, considering the low PC densities and low Internet access, direct consumer benefits may take some time to be realized. What may be distinctly important for ASEAN today are the opportunities that e-commerce via the Internet provides to SMEs which abound in this part of the globe. One business model is being started in the Philippines. The International Finance Corporation together with, the PlantersBank, and local development bank, eVicom a Silicon Valley engineering and consultancy firm and Philippine Chamber of Commerce and Industry, and Asian Institute of Management collaborated to set up a portal for SMEs called ePlanters³³. Services include web hosting and payments systems. The service is being paid for on a commission basis.

ASEAN has seen also its share of business exchanges. Government only need to support the establishment of business exchanges between large corporation and their suppliers with appropriate legal environment. Only when these exchanges will include SMEs that may require capability-building investments will government need to go beyond the provision of proper business environment.

D. Challenges and Issues

The challenges and issues brought about by e-commerce can be organized into two groups: (1) infrastructure – including communications, payments and distribution; and (2) socioeconomic, cultural and legal environment.

On the infrastructure aspect of e-commerce, the business side is less of a problem compared to the consumer side of the communication infrastructure. Business will put up more e-commerce servers as necessary when they feel they can benefit from them. The consumers, however, will be limited by their capacity to pay. It should be noted that except

³³ <http://plantersbankecommerce.com/>

for Singapore, there is still low PC penetration rates and even much lower proportion who have access to the Internet among ASEAN countries. Since this is directly related to the level of development, nothing much can be done except to promote rapid growth and development. It should be mentioned, however, that one of the recognized ways of promoting access, given the level of development, is provision of public Internet kiosks to provide access to those who cannot afford their own connection at home.

Another aspect of the access issue is affordability. The high cost of Internet access is one of the biggest obstacles to expanding access (e.g Mann, et al. (2000)). It is well known that competition brings down access rates. As noted earlier, some of the member countries are still saddled with restrictions on ownerships and other barriers to entry in the ICT sectors. Measures to promote competition should be put in place to bring down access rates.

All over the world, surveys show that there is still a lot of anxiety over the extent of protection e-commerce players have given the existing legal environment. The Sacher Report (OECD 1977) argues that for e-commerce to flourish, the level of confidence must approximate those accorded to normal over the counter transactions. As mentioned, there is already consistent move toward enacting so called cyberlaws. At least three countries in ASEAN have already enacted e-commerce laws protecting various aspects of the transactions. The e-ASEAN taskforce predicted that by 2003 all ASEAN member countries will have e-commerce laws in place. Given that e-commerce facilitates trans-border transactions, cross-country harmonization will be a continuing challenge.

In addition to the high costs and anxiety due to lack of protection, is the doubtful cultural acceptance of electronic transactions. A large proportion of people in ASEAN may have not done or even witnessed business transactions other than those done over the counter. Even catalogue selling is not that popular in this part of the globe. This represents a substantial cultural hurdle to overcome. Again governments can do a lot to improve the acceptance of electronic transactions in peoples' lives by introducing ICT in their operations.

Credit card ownership, which is the prevailing form of payment for electronic transactions, is said to be low in Asia. If credit card ownership cannot be increased, some other electronic forms of payment need to be developed. Without electronic payments, much of e-commerce will be difficult to consummate. Without electronic payment facilities, websites will remain to be information booths rather becoming venues where business transactions are consummated.

There is not much information on the reliability and efficiency of the distribution and delivery systems in many of the ASEAN countries. Even if trans-border shipments can be handled by big international carriers, this has to be complemented by reliable and efficient domestic distribution systems in each of the countries. It cannot be overemphasized that the benefits of speed of electronic transactions will be negated by an unreliable and inefficient distribution systems.

Taxation poses another formidable challenge. Since tariffs are going down with liberalization, governments are looking for new forms of tax base. E-commerce poses the

challenge of a rapidly growing but largely “invisible” transactions. This is particularly true for goods that are “digitally” delivered. Confusion that may arise due to the nature of E-commerce transactions may lead to inappropriate taxation that can inadvertently stifle the growth of e-commerce. A preview of what this mean is shown in the example given in Lallana et al. (n.d.) that goes like this: “Suppose a piece of music is composed by a German-citizen artist residing in the United States. The music is then produced and copyrighted in France. That particular music not sits on a server/seller in Japan. A copy of that particular music is subsequently purchased by a Filipino in Manila using his credit card which he has sent to the server. After the credit card has been verified, the music is now downloaded into the Filipino’s computer. The sale is then completed. Which jurisdiction has the right to collect sales taxes for this and other similar transactions?”

Governments have a lot of leadership roles to play in the promotion of e-commerce. Unfortunately, as the e-ASEAN taskforce has pointed out, they are failing in the most elemental role with the low utilization of ICT in government operations. The taskforce has called on ASEAN governments to lead by example. Just as big corporations can encourage their suppliers to go electronic through online exchanges using EDI, government can also encourage thousands of small business to go electronic by setting up electronic procurement systems. In addition, governments can also lead in the use of the Internet to deliver services like Singapore’s eCitizen website.

E. Summary

There are a lot opportunities created by ECommerce through the Internet. However, being a public network, there are also accompanying risks that need to be understood and dealt with properly. For many of the ASEAN countries where PC penetration is low and credit card ownership is thin, consumer benefits will be limited for sometime. This will go on, at least, until the average level of access has improved, means of electronic payments are installed and widely accepted and delivery systems become more reliable. There are real opportunities, however, that are doable right away even under this poor infrastructure conditions. One, is providing platforms for connecting SMEs, which abound in ASEAN, to be plugged into the Internet and to the global supply chain. This does not need the extensive infrastructure required for more diffused consumer benefits. It must be noted, however, that this presumes production efficiencies exists. If SMEs cannot sell over the counter, they cannot also expect to sell electronically. Second, are two opportunities for governments not only to provide leadership in the use of ICT but also improve the efficiency of their operations. One is using the Internet to provide many basic public services. Another is the setting up of an electronic procurement system, again using the Internet. Government should also support the establishment of big business exchanges using the Internet rather than proprietary protocols and private lines so that even small players can participate. Finally, one efficient way of dealing with low consumer access rates is providing public Internet kiosks.

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Table 1: E-Commerce Matrix

Seller\Buyer	Business	Consumer	Government
Business	<p>B2B <i>(Businesses offering to sell or buy goods and services to other businesses)</i></p> <p>GM/Ford (with suppliers and dealers)</p> <p>National Transportation Exchange (Buyer and sellers of trucking space)</p> <p>Philippines: SVINet/Macro (Shopping mall and suppliers) PhilBX</p>	<p>B2C <i>(Businesses offering to sell goods and services to consumers)</i></p> <p>Amazon (retail bookselling) Dell (direct computer selling)</p> <p>Philippines: Estore-Exchange (retail, various items)</p>	<p>B2G <i>(Business offering to sell goods and services to government)</i></p> <p>Singapore: GeBiz (One-stop, round-the-clock center for gov't business dealings)</p>
Consumer	<p>C2B <i>(Consumer offering to sell goods and services to business)</i></p> <p>Priceline (consumers bid for airline tickets)</p> <p>JobsDB(businesses posting job vacancies) Consultants' web pages</p>	<p>C2C <i>(Consumers offering to buy and sell goods and services to other consumers)</i></p> <p>Ebay (consumer auctions)</p>	<p>C2G <i>(Consumers offering to sell goods and services to government)</i></p>
Government	<p>G2B <i>(Government offering to sell goods and services to businesses)</i></p> <p>Philippines: Customs (Importation) PhilJobNet (Employment facilitation)</p>	<p>G2C <i>(Government offering to sell goods and services to consumers)</i></p> <p>US ServiceArizona (renew motor vehicle registrations, ordering personalized plates to replacing lost ID cards, etc.)</p> <p>Singapore: eCitizen Center (integrated gov't service delivery)</p> <p>Philippines: PhilJobNet (Employment Facilitation)</p>	<p>G2G <i>(Government offering to buy or sell goods and services to other government agencies)</i></p>

Table 2
Worldwide E-commerce Growth
in US\$ Billion

	2000		2004		CAGR (%) 2000-2004	% of total sales in 2004
	Level	%	Level	%		
Total	657.0	100.0	6,789.8	100.0	58.4	8.6
North America	509.3	77.5	3,456.4	50.9	47.9	12.8
United States	488.7	74.4	3,189.0	47.0	46.9	13.3
Canada	17.4	2.6	160.3	2.4	55.5	9.2
Mexico	3.2	0.5	107.0	1.6	87.7	8.4
Asia Pacific	53.7	8.2	1,649.8	24.3	85.6	8.0
Japan	31.9	4.9	880.3	13.0	82.9	8.4
Australia	5.6	0.9	207.6	3.1	90.3	16.4
Korea, Republic of	5.6	0.9	205.7	3.0	90.1	16.4
Taiwan	4.1	0.6	175.8	2.6	94.0	16.4
All Other	6.5	1.0	197.1	2.9	85.3	2.7
Western Europe	87.4	13.3	1,533.2	22.6	71.6	6.0
Germany	20.6	3.1	386.5	5.7	73.3	6.5
United Kingdom	17.2	2.6	288.8	4.3	70.5	7.1
France	9.9	1.5	206.4	3.0	75.9	5.0
Italy	7.2	1.1	142.4	2.1	74.6	4.3
Netherlands	6.5	1.0	98.3	1.4	67.9	9.2
All Other	25.9	3.9	410.8	6.1	69.1	6.0
Latin America	3.6	0.5	81.8	1.2	78.1	2.4
Rest of the World	3.2	0.5	68.6	1.0	76.6	2.4

Source: Forrester, April 2000

Note: Totals may not equal sum of rows due to rounding

Table 3
Estimates of e-commerce sales compared to various benchmarks

	E-commerce estimates (US\$ billion)	US catalogue sales (percentage)	US credit card purchases (percentage)	Direct marketing (percentage)	OECD-& total retail sales (percentage)
Current (1996/97)	26	37	3	2	0.5
Near-term (2001/02)	330	309	24	18	5
Future (2003/05)	1000	780	54	42	15

Source: Table 1.3 of "Economic & Social Impacts of Electronic Commerce, Preliminary Findings and Research Agenda", OECD (1999)

Table 4
Selected individual firm e-commerce revenues by activity
US\$ million

Activity	% to Total	1995-97
E-commerce: business-to-business		
CSX		3,000
GE		1,000
NEC		16,528
Cisco (e-commerce sales)		2,496
Computers: Dell		730
Computers: Gateway		150
Computers: NECX		35
Images: Photodisc		4
Total business-to-business	90.12	23,943
E-commerce: business-to-consumer		
Autos: Auto-By-Tel		14
Flowers: 1-800-Flowers		48
Books: Amazon		148
Books: Barnes & Noble		14
Groceries: Peapod		60
Groceries: NetGrocer		78
Gardening: Garden Escape		1
Misc.merchandise: AoL		464
Misc.merchandise: Onsale.com		100
Misc. merchandise: NetMarket.com (Cendant (CUC))		1,000
Misc. merchandise: Internet Shopping Network		15
Misc. merchandise: eBay		100
Toys: eToys		10
Newspapers: Wall Street Journal		7
Travel: Expedia		104
Travel: Preview		12
Travel: EasySABRE and Travelocity		100
Ticket sales by Ticketmaster		60
Pornography: Virtual Dreams		8
Pornography: Internet Entertainment Group		20
Pornography: Persian Kitty		1
Pornography: CyberErotica		9
Pornography: Playboy		4
On-line gambling: Sports International		6
On-line gambling: Interactive Gambling and Communications		58
Music: CDnow		15
Music: Tower Records		8
Music: N2K		12
Consumer stock brokerage: E*Trade		148
Total business-to-consumer	9.88	2,624
Total	100.00	26,567

Source: Table 1.2 of "Economic & Social Impacts of Electronic Commerce, Preliminary Findings and Research Agenda", OECD (1999)

Table 5
Distribution by Top-Level Domain by Host Count
January 1995 to January 2000

Domain	Country	CAGR (%)		Number of Hosts		Host per 10,000 Pop.	
		1995-2000*	1995	2000	1995-2000*	1995	2000
	World	54.06	4,851,843	72,398,092	52.73	8.56	119.566
sg	Singapore	66.81	5,252	148,249	65.38	15.815	415.613
my	Brunei Darussalam	54.82	-	1,398	52.63	0.000	42.622
th	Malaysia	72.08	1,606	59,012	70.06	0.799	26.529
id	Thailand	62.93	1,728	40,176	62.00	0.295	6.543
ph	Philippines	72.28	334	12,394	70.16	0.049	1.631
bn	Indonesia	95.57	177	21,052	94.14	0.009	0.993
kh	Cambodia	58.61	-	155	56.37	0.000	0.139
vn	Vietnam	107.56	-	126	106.01	0.000	0.016
mm	Myanmar	138.63	-	4	137.39	0.000	0.001

Source: Network Wizards, Internet Domain Survey

Population Division, Department of Economic and Social Affairs, UN. World Population Prospects, The 1998 Revision.

Note: * Cambodia figure refers to growth rate 1998-2000; Vietnam growth rate 1997-2000; Myanmar growth rate 1999-2000

** Medium Assumption

Table 6
Internet Hosts and Estimated Number of PCs

Country/Region	Internet												Estimated PCs					
	Internet Hosts						Users						Total			Per 100 inhab.		
	Total			per 10'000 inhab. (k)			Total			per 10,000 inhab.			(k)		Growth Rates %	Per 100 inhab.		Growth Rates %
	(k)		Growth Rates %			Growth Rates %	(k)		Growth Rates %			Growth Rates %	1996	1999	1996-1999	1996	1999	1996-1999
Brunei Darussalam	206	1,399	-	6.87	43.49	-	3.4	10.0 [98]	54.07	113.03	317.46	34.42	8	-	-	2.87	-	-
Cambodia	-	155	-	-	0.14	-	-	0.7 [97]	-	-	0.67	-	-	9 [97]	-	-	0.09	-
Indonesia	9,591	21,052	26.21	0.49	1.01	24.11	80.0	300.0 [98]	66.09	4.06	14.54	42.52	940	1,700 [98]	29.63	0.48	0.82	17.85
Lao P.D.R.	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	0.11	-	-
Malaysia	25,200	59,012	28.36	12.24	27.03	26.41	63.9	800.0 [98]	126.33	31.07	367.82	82.38	880	1,300 [98]	19.51	4.28	5.98	11.15
Myanmar	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Philippines	3,628	12,394	40.95	0.50	1.66	40.00	40.0	150.0 [98]	66.09	5.56	20.56	43.59	670	1,100 [98]	24.79	0.93	1.51	16.16
Singapore	28,892	148,249	54.51	94.91	459.72	52.59	150.0	950.0	61.53	492.72	2,945.92	59.61	660	1,450 [98]	39.35	21.68	45.84	24.96
Thailand	9,245	40,176	48.97	1.54	6.60	48.51	80.0	200.0 [98]	45.81	13.33	33.17	30.39	1,000	1,300 [98]	13.12	1.67	2.16	8.58
Vietnam	5	126	-	-	0.02	-	0.1	10.0 [98]	230.26	0.01	1.29	161.99	250	500 [98]	34.66	0.33	0.64	22.08
Asia	1,042,738	4,212,758	46.54	3.04	11.74	45.04	9,209.7	36,954.9	46.31	29.08	107.47	43.57	38,608	67,909	18.82	1.26	2.07	16.55
World	16,252,758	71,825,360	49.53	28.14	119.70	48.26	50,089.3	243,817.8	52.75	91.89	418.62	50.55	234,200	345,053	12.92	4.65	6.26	9.91

Source: ITU (Internet host data: Internet Software Consortium, RIPE).

Table 7
SSL Server Survey * July 1998

Location	Sites	Percentage
United States (US)	14,674	71.74
Japan (JP)	429	2.10
Singapore (SG)	67	0.33
Malaysia (MY)	24	0.12
Indonesia (ID)	11	0.05
Thailand (TH)	6	0.03
Philippines (PH)	3	0.01
Cambodia (KH)	1	0.00

Source: Netcraft (<http://www.netcraft.com/>)

*The Netcraft Secure Server Survey examines the use of encrypted transactions on the Web through extensive automated exploration of the Internet.

Table 8
Estimated Number of People Who are On-Line*
In Millions

	Mar-1998	Mar-1999	Mar-2000	CAGR (%)
World	119	171.3	304	31.3
Africa	1	1.1	2.6	31.9
Asia/Pacific**	17.27	27	68.9	46.1
Europe	23	40	83.4	42.9
Middle East	0.75	0.9	1.9	31.0
North America	70	97	136.9	22.4
South America	7	5.3	10.7	14.1

Source: NUA Internet Surveys

*figures represent both adults and children who have accessed the Internet at least once during the 3 months prior to being surveyed

** includes Australia and New Zealand

Table 9
Internet dial-up account forecast

Year	1995	2000	2004	CAGR (%)	
				1995-2000	2000-2004
Number					
Indonesia	18,000	300,000	1,300,000	56.3	36.7
Malaysia	20,000	666,000	1,400,000	70.1	18.6
Philippines	5,000	495,000	2,900,000	91.9	44.2
Singapore	17,500	992,000	3,200,000	80.8	29.3
Vietnam*	-	74,600	210,100	155.6	34.5
Per 10,000 pop.					
Indonesia	0.91	14.14	58.37	54.8	35.9
Malaysia	9.95	299.41	588.31	68.1	15.0
Philippines	0.73	65.16	354.10	89.8	41.2
Singapore	52.69	2,781.05	8,611.80	79.3	32.4
Vietnam*	-	9.34	25.29	154.1	33.2

Source: For Dial-up accounts (Pyramid Research); for population (UN Population Division)

* 2004 values are for 2003

Table 10
Telephone Lines and Cellular Subscribers

Country/Region	Main Telephone Lines						Cellular mobile subscribers					
	Total (k)		Growth Rate %	per 100 inhabitants		Growth Rate %	Total (k)		Growth Rate %	Per 100 Inhabitants		Growth Rate %
	1996	1999	1996-1999	1996	1999	1996-1999	1996	1999	1996-1999	1996	1999	1996-1999
Brunei Darussalam	78.8	77.7 [98]	-0.70	26.26	24.68	-2.07	36 [95]	49 [98]	10.44	12.63	15.60	7.04
Cambodia	8.1	27.7	40.99	0.08	0.25	37.98	20	89	49.63	0.20	0.81	46.62
Indonesia	4,186.0	6,080.2	12.44	2.13	2.91	10.40	513	2,221	48.85	0.26	1.06	46.84
Lao P.D.R.	26.3	28.5 [98]	4.02	0.56	0.55	-0.60	4	7 [98]	26.84	0.08	0.12	13.52
Malaysia	3,771.3	4,433.0	5.39	18.32	20.31	3.44	1,520	2,200 [98]	18.48	7.39	10.11	10.45
Myanmar	178.6	229.3 [98]	12.49	0.39	0.52	9.59	7	9 [98]	7.61	0.02	0.02	0.00
Philippines	1,787.0	2,700.0 [98]	20.64	2.49	3.70	13.20	959	1,734 [98]	29.61	1.33	2.38	19.40
Singapore	1,562.7	1,860.6	5.82	51.33	57.70	3.90	306 [95]	1,532	53.68	10.25	47.50	51.12
Thailand	4,200.2	5,037.5 [98]	9.09	7.00	8.35	5.88	924	1,957 [98]	37.51	1.54	3.25	24.90
Vietnam	1,186.4	2,000.0 [98]	26.11	1.58	2.58	16.35	69	187 [98]	49.92	0.09	0.24	32.69
Asia	206,647.2	279,151.5	10.02	6.02	7.83	8.76	46,659	156,020	40.24	1.36	4.38	38.99
World	743,661.7	878,037.3	5.54	12.88	14.73	4.47	139,529	472,683.40	40.67	2.41	8.02	40.08

Source: ITU

Table 11
Television Statistics

Country/Region	Television Households*					
	Total (k)		Growth Rate %	As a % of total households		Growth Rate %
	1996	1998	1996-1998	1996	1998	1996-1998
Brunei Darussalam	50	...		98.0	...	
Cambodia	75	90	9.12	4.5	5.0	5.27
Indonesia	25,500	26,000	0.97	57.9	55.3	-2.30
Lao P.D.R.	33	...		4.1	...	
Malaysia	3,100	3,200	1.59	75.8	72.7	-2.09
Myanmar	237	261	4.82	2.6	2.8	3.71
Philippines	7,600	6,850	-5.19	56.7	47.2	-9.17
Singapore	671	695	1.76	89.4	85.8	-2.06
Thailand	9,000	12,300	15.62	62.9	85.4	15.29
Vietnam	11,500	11,850	1.50	75.7	75.5	-0.13
Asia	410,959	478,399	7.60	53.8	65.0	9.46
World	856,799	937,771	4.52	66.0	73.1	5.11

Source: ITU

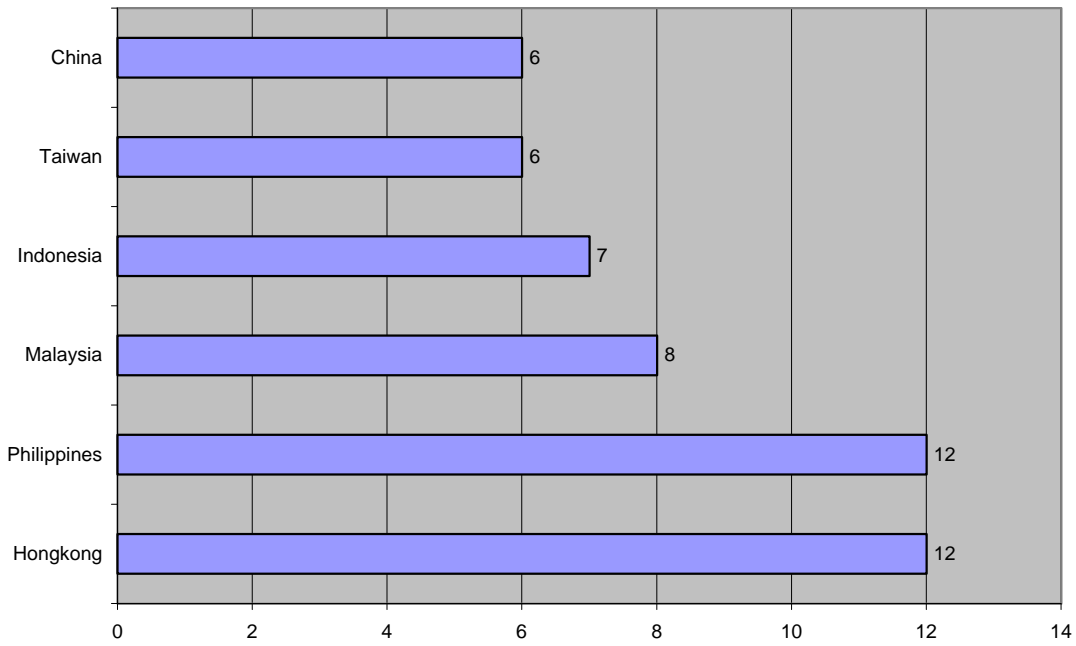
* Television households is the number of households that have television receivers.

Table 12
Households in Asia with Cable, 1998
Millions

Country	Television HHs	Cable Subscribers	Percentage
Singapore	0.83	0.18	21.6
Philippines	7.95	0.68	8.6
Malaysia	3.73	0.19	5.1
Thailand	13.69	0.28	2.0
Indonesia	28.09	0.04	0.1
Taiwan	5.89	4.40	74.7
India	59.55	18.25	30.6
New Zealand	1.25	0.35	28.0
Hong Kong	1.85	0.48	26.0
China	309.80	68.80	22.2
Japan	42.59	6.34	14.9
Australia	6.22	0.90	14.5
South Korea	14.13	0.75	5.3
Total	495.57	101.63	20.5

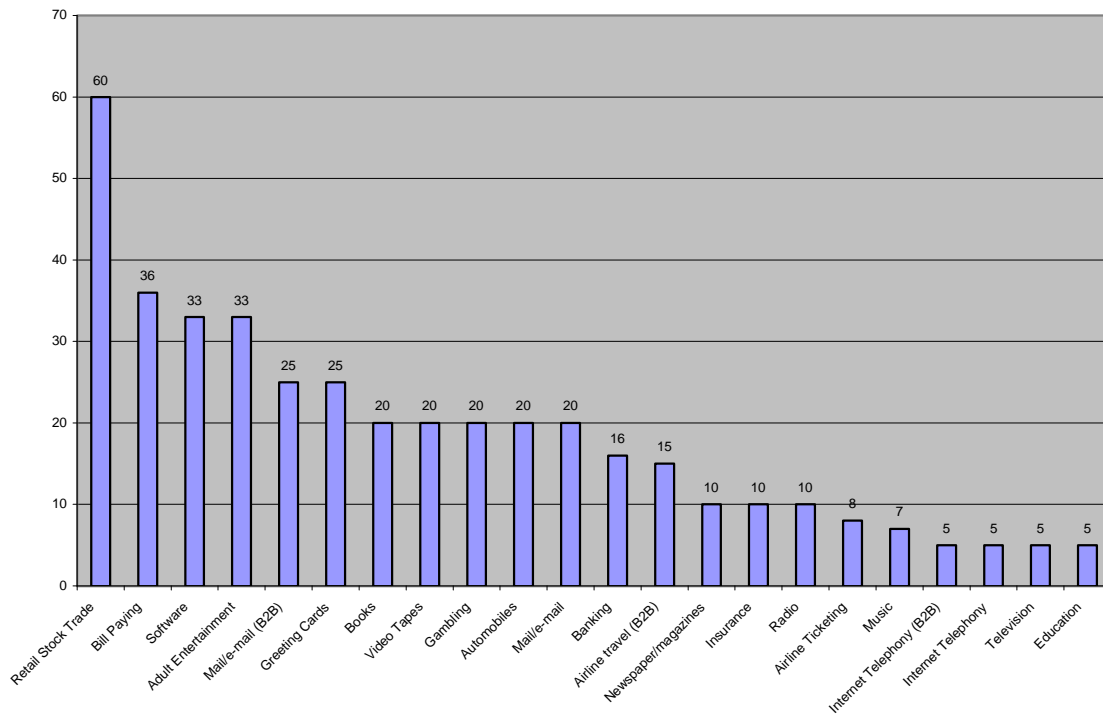
Source: Baskerville Communications Corp cited in eAsia report of Emarketer, 2000

Figure 1. Percentage of Users in Major Asian Economies who Reported Ever Using the Internet to Make a Purchase



Source: ACNielsen NetWatch, 1999

**Figure 2. Impact of E-Commerce on a Product Basis, 2000-05
Estimates of Online Shares in Percentages**



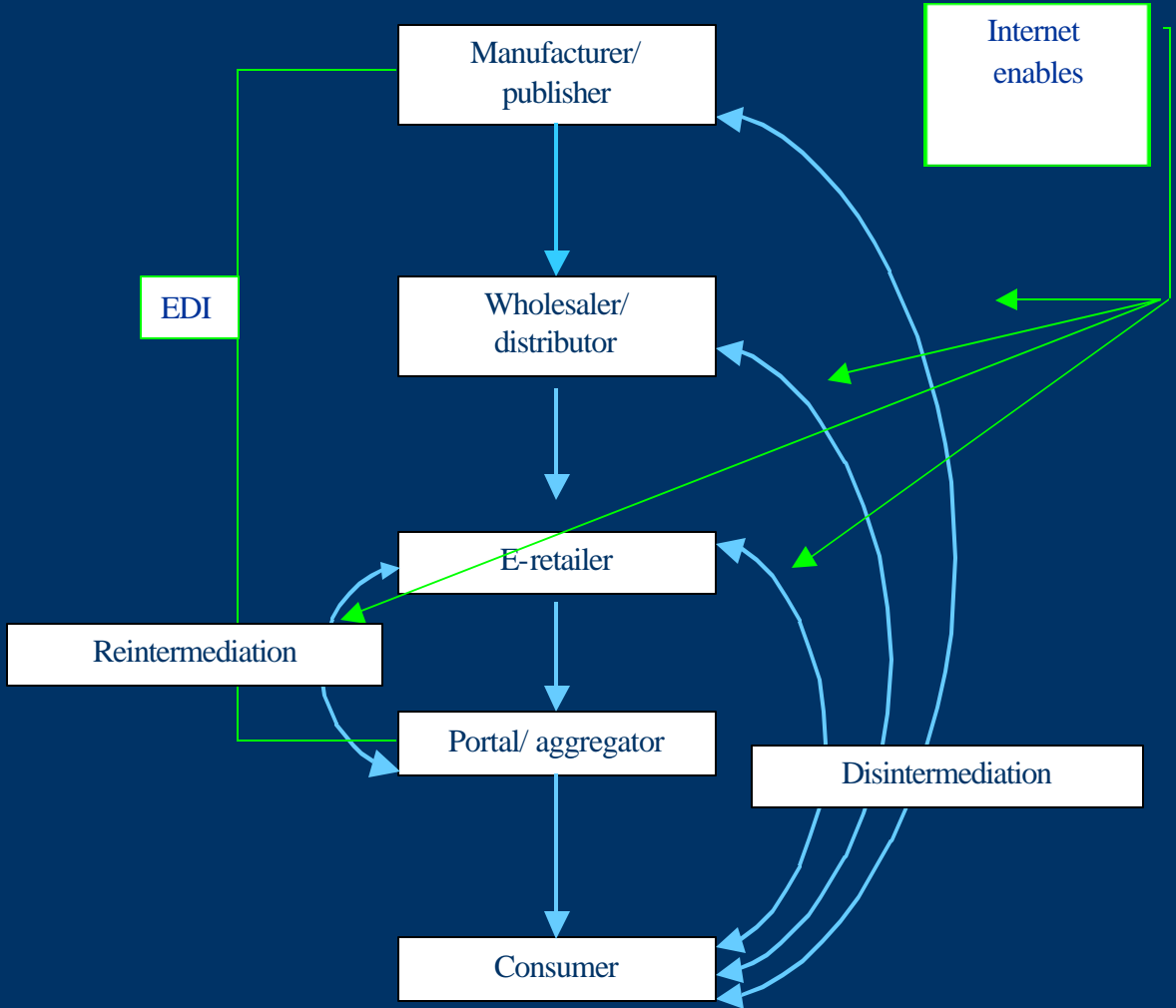
Source: OECD, 1999

Table 13
E-Commerce impact on various distribution costs
US\$ per transaction

	Airline Tickets	Banking	Bill Payment	Term Life Insurance Policy	Software Distribution
Traditional System	8	1.08	2.22 to 3.32	400-700	15
Telephone-based		0.54			5
Internet-based	1	0.13	0.65 to 1.10	200-350	0.20 to .50
Savings (%)	87	89	71 to 67	50	97 to 99

Source: Table 2 of the "Economic & Social Impacts of Electronic Commerce, Preliminary Finding and Research Agenda, Executive Summary", OECD (1999)

Figure 3: Rebuilding the Value Chain



Adopted from The Economist (February 2000); Benchmark Capital