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**Telecommunications Working Group (TEL)
Business Facilitation Steering Group (BFSG)**

**SME Electronic Commerce Study
(TEL05/97T)**

Final Report

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1.0 Introduction

PricewaterhouseCoopers was selected by the Asia Pacific Economic Cooperation (APEC) Telecommunications Working Group (TEL) under its Business Facilitation Steering Group (BFSG) to undertake a survey and study on electronic commerce adoption, uptake and use by small and medium enterprises (SMEs) in all 21 APEC member economies. The following report provides the analysis and findings of this study.

1.1 CONTEXT AND RATIONALE

At the 1997 APEC Summit in Vancouver, the APEC Leaders and Ministers “recognized the importance of electronic commerce and accorded high priority to identifying ways to maximize its social and economic benefits for all APEC member economies.”¹

Companies around the world are acting on the same imperative. A recent report by PricewaterhouseCoopers points out that “the world’s leading organizations are reorienting themselves around e-business ... indeed, e-business promises to define the ground rules for commerce in the 21st Century.”²

But large multinational firms are only part of the e-commerce³ story. Many smaller firms have emerged to take prominent – even leading – positions in segments of the burgeoning global electronic marketplace. Indeed, one of the most important features of electronic commerce is the opportunity and promise it holds for SMEs to extend their capabilities and grow.

Moreover, SMEs are significant players in business-to-business (B-to-B) electronic commerce, which constitutes more than 80 percent of all e-commerce activity. SMEs that can demonstrate their capabilities to use electronic commerce will have a competitive advantage in the B-to-B marketplace. For example, most of the large firms currently developing and implementing B-to-B e-commerce strategies typically engage SMEs in their supply chains. For these large firms, the rate at which SMEs adopt e-commerce and enhance their capabilities could affect the scope and timing of their B-to-B e-commerce implementation. Alternatively, SMEs that do not keep pace with electronic commerce may become marginalized as suppliers.

Enhancing the role and participation of SMEs in the global marketplace through electronic commerce is of critical importance to APEC. SMEs are key to

The 21 APEC member economies are:

Australia
Brunei Darussalam
Canada
Chile
China
Hong Kong, China
Indonesia
Japan
Korea
Malaysia
Mexico
New Zealand
Papua New Guinea
Peru
Philippines
Russian Federation
Singapore
Chinese Taipei
Thailand
United States
Vietnam

“Small businesses don’t really have the brand recognition that bigger companies have. However, with electronic commerce SMEs can create a presence and compete in markets that were traditionally dominated by big business.”
SME (Sales and Marketing), United States

¹ APEC Leaders Statement: 1997 Vancouver APEC Summit (November 1997)

² PricewaterhouseCoopers, *E-Business Technology Forecast, 1999*, p.1.

³ The terms *electronic commerce* and *e-commerce* are used interchangeably throughout the text. The term *electronic business* or *e-business* is also used in this report to refer to the full range of business transformations brought about by the use of electronic networks. See Section 1.3.1 for definitions.

economic growth and productivity in all of the APEC member economies. Within the APEC region there are 40 million or more SMEs which together:

- comprise over 95% of all enterprises,⁴
- employ up to 84% of the workforce,
- contribute between 30% and 60% of GDP, and
- account for about 35% of all exports from the APEC region.⁵

Across the APEC region, SMEs embody the tremendous diversity and richness of experience, capabilities and productivity that characterize APEC itself.

This report explores the opportunities and benefits for SMEs in the APEC region to use electronic commerce. It identifies the obstacles and barriers to greater APEC SME participation in the global electronic marketplace. It also examines areas where measures or initiatives – by governments or by others – might effectively address the inhibitors to SME adoption of electronic commerce. These include measures to improve market conditions, build trust and confidence in the electronic marketplace, address gaps in the information infrastructure, and build firm-level SME capability to participate fully in electronic commerce.

“E-commerce will bring SMEs great opportunities, such as shortening cycle periods, reducing labour and inventory costs, developing potential new markets, and competing internationally.”
Key Informant
(Government), China

1.2 STUDY OBJECTIVES

The aim of this study was to undertake a qualitative assessment of the adoption, uptake and use of electronic commerce by small and medium enterprises (SMEs) across all twenty-one APEC member economies. It investigated the opportunities, benefits and the real and perceived barriers to the adoption and use of electronic commerce among SMEs in the region. In particular, this study focused on early adopters of electronic commerce on the assumption that these companies are the best situated to identify and evaluate the opportunities, benefits and inhibitors for e-commerce adoption and use by SMEs.

The main objectives of this study were to assess the following APEC SME characteristics with regard to electronic commerce:

- A general assessment of SME adoption of electronic commerce and future usage;
- An assessment of how the SME community uses electronic commerce, with an emphasis on the potential opportunities and perceived benefits of e-commerce by SMEs;
- An assessment of the perceived impediments and barriers to the adoption and use of electronic commerce by SMEs;

“There is not a single small business that cannot use information and communications technologies to redefine itself and prosper. Simple networking will lead to intelligence gathering and discovery of new business opportunities.”
Key Informant (Private Sector), Canada

⁴ APEC SME Policy Level Group, *APEC SME Indicators: A Feasibility Assessment*, 1998.

⁵ APEC, *The APEC Survey on Small and Medium Enterprises*, 1994.

- An assessment of how SMEs perceive security and legal issues, and their opinion as to their importance to the uptake of electronic commerce; and
- An assessment of how SMEs perceive economies' interventions to promote and support the adoption of electronic commerce.

The study results will help the TEL, BFSG and other APEC working groups develop future work plans and help guide their policy and analysis functions and technology pilot project selection. Publication of the study results should also help SMEs and their business partners in larger companies to fulfil the leading role which APEC expects them to play in the development of electronic commerce throughout the region.

1.3 OVERVIEW OF THE METHODOLOGY

This study employed qualitative methods, reinforced by quantitative techniques, to elicit the views and perceptions of SMEs with regard to potential opportunities, perceived benefits and barriers to the adoption and use of electronic commerce in the APEC economies. The study was not intended to make a statistical measurement of e-commerce uptake by SMEs in each APEC economy.

This study sought the opinions of early adopters and users of electronic commerce in the SME community. This approach was then used to identify measures, in terms of policies, programs or initiatives, that might be taken by APEC member economies – individually or collectively – to address the barriers identified by early adopters and thus enable the next wave of SMEs to adopt e-commerce without facing the same barriers.

1.3.1 Definitions

In conducting a study of this nature it was important to define a consistent set of terms for broad application across APEC member economies.

Electronic Commerce – Several definitions of electronic commerce have been developed and used in different contexts and for varying purposes.⁶ It has been recognized within APEC that “there are a number of levels of engagement in electronic commerce that require different levels of infrastructure and involve different costs. Electronic commerce needs to be recognized as covering a broad range of activity.”⁷

⁶ For example, the OECD has adopted a policy driven definition of electronic commerce as that of “business occurring over open, non-proprietary networks such as the Internet.” See: *The Economic and Social Implications of Electronic Commerce*. OECD, 1999.

⁷ APEC Electronic Task Force. *Co-Chairs' Summary*. 4th Meeting, 21-22 October 1998.

For the purposes of this study, electronic commerce is defined as *the use of computers and electronic networks to conduct business over the Internet or another electronic network*. In this definition, the term “business” means all activity that generates value both within the firm and with suppliers and customers. This broad definition for electronic commerce is similar to the term *e-business* as used by PricewaterhouseCoopers and others to denote the value that is added to internal and external business processes by the use of electronic networks.

Small and Medium Enterprise – The definition of what constitutes an SME varies widely among APEC member economies.⁸ For the APEC-wide context and purpose of this study, a common definition was required. Our definition of SME for this study is based on the number of persons employed by the firm, and includes companies with up to 500 employees.

“Electronic commerce includes the whole cycle from pre-transaction information gathering and order placement, to the transaction or delivery of the goods, and to the post-transaction steps of transferring funds and offering service and support.”
Key Informant (Private Sector), United States

1.3.2 Multiple Lines of Evidence

This study employed multiple lines of evidence – focus groups, multilingual web surveys, key informant interviews and desk research – to assess the perceptions of SMEs regarding the real and potential future benefits of electronic commerce, the obstacles and inhibitors to their use, and appropriate measures that may be employed to enable more rapid adoption of electronic commerce by the SME community.

PricewaterhouseCoopers conducted this study using four primary data-gathering techniques:

- **Focus groups** - Focus groups with SMEs were organized through local PricewaterhouseCoopers offices in each of the APEC economies, in collaboration with SME-oriented organizations and/or associations. The group discussions were facilitated by local PricewaterhouseCoopers consultants experienced in planning, recruiting and delivering focus groups, and in analyzing and reporting the results. SMEs were selected for the focus group sessions based on the objective of achieving a mix of factors, such as firm size, sector, level of e-commerce capability and degree of export orientation. Two focus groups were scheduled in each APEC economy, with SMEs from the goods sector generally in one session and those from the services sector in the other. The questions were, for the most part, open-ended, but participants were also asked to complete a workbook during the session and a questionnaire (similar to the web-based survey described below) at the end of the session to document specific points. In a few cases, the focus groups were supplemented by larger workshops carried out in conjunction with other events, such as trade association meetings. **More than 42 focus groups were conducted with SMEs in all 21 APEC member economies for this project.**

⁸ APEC SME Policy Level Group, *APEC SME Indicators: A Feasibility Assessment*, 1998.

- **Multilingual web survey** - A multilingual web-based survey provided an additional opportunity for input by SMEs that are already Internet users. The survey was distributed to SMEs via e-mail, based on lists provided through local SME organizations and industry associations. The survey was conducted in ten languages widely used in the APEC region to ensure that local SMEs were able to understand the questions and respond accordingly. These questions were generally multiple choice due to language considerations, but there was also a provision for textual comments. The inclusion of a web-based component, which is beginning to emerge as an important feature in survey assignments, provided additional information, and it demonstrated APEC's commitment to using electronic commerce and the Internet. Focus group participants and other interested SMEs in various APEC member economies also completed a paper-based version of the questionnaire. This extra step increased the coverage of the survey and provided additional responses from those locations where a response to the web-based survey was expected to be relatively low. The multilingual web survey was located on the Internet at apcc.pwcglobal.com. *More than 1,300 responses to the survey were received from SMEs, representing practically all 21 APEC member economies.*
- **Key informant interviews** – Interviews were conducted with government officials, industry leaders and other key informants in each of the APEC economies. In general, these interviews were conducted in person, with the telephone used as a substitute when required. In a few cases, interviews were conducted with a small group of people from the same organization, rather than with a particular individual. These interviews provided a contextual understanding through the insights and expert opinions of experienced electronic commerce practitioners throughout the region. *Over 75 interviews were conducted in all 21 APEC member economies for this assignment.*
- **Desk research** – Desk research was also conducted in the APEC member economies to supplement information obtained from the interviews, focus groups and web survey. This desk research included collection of documents and studies related to SMEs and electronic commerce in various APEC economies.

1.4 ANALYTICAL FRAMEWORK

The analytical framework employed in this study was designed to address the wide differences in the economic structures and levels of development among APEC member economies relevant to the adoption, uptake and use of electronic commerce. It also aimed to address the diverse opinions and perspectives of SMEs with varying levels of e-commerce development and capability.

1.4.1 A Framework for Examining Differences among APEC Economies

A prominent feature of APEC is the wide diversity in economic and social development among its 21 members that includes developed, developing and transition economies. In broad terms, this study distinguishes between two groups of APEC economies – those with GNP per capita above US\$10,000 and those with GNP per capita near or below US\$5,000.

This distinction, based on World Bank statistical tables, has been selected because it correlates strongly with other key indicators that reveal important differences in per capita information infrastructure availability among the APEC economies. Indicators such as computer density, telephone mainline density, and Internet host density are widely considered to be fundamental prerequisites for the uptake and use of electronic commerce in a given economy.

Exhibit 1.1: GNP Per Capita and Key Information Infrastructure Indicators in APEC Economies

(Penetration rate, per 100 inhabitants, of computers, Internet hosts and telephone lines, 1996)

Group	APEC Member Economy	GNP Per Capita (US\$)	Computer Density	Internet Host density	Telephone Main line Density	Population (millions)
Higher-GNP Economies	Australia	20,540	31.1	3.82	51.9	19
	Brunei Darussalam	25,090	N/A	N/A	N/A	0.3
	Canada	19,280	19.3	2.28	60.2	30
	Hong Kong, China	25,280	15.1	0.75	54.7	7
	Japan	37,850	12.8	0.76	48.9	126
	Korea	10,550	13.1	0.29	43.0	46
	New Zealand	16,480	26.6	4.24	49.9	4
	Singapore	32,940	21.6	1.96	51.3	3
	Chinese Taipei	N/A	N/A	N/A	N/A	22
	United States	28,740	36.2	4.42	64.0	268
Lower-GNP Economies	Chile	5,020	4.5	0.131	15.6	15
	China	860	0.3	0.002	4.5	1,227
	Indonesia	1,110	0.5	0.005	2.1	200
	Malaysia	4,680	4.3	0.193	18.3	21
	Mexico	3,680	2.9	0.037	9.5	95
	Papua New Guinea	940	N/A	0.002	1.1	5
	Peru	2,460	0.6	0.026	6.0	25
	Philippines	1,220	0.9	0.006	2.5	73
	Russian Federation	2,740	2.37	0.055	17.5	147
	Thailand	2,800	1.67	0.021	7.0	61
	Vietnam	320	0.3	0.00	1.6	77

Source: World Bank, *World Development Report 1998/1999*

Any effort to assess current and future electronic commerce use in APEC must begin with the recognition of significant differences in information infrastructures among APEC members. Exhibit 1.1 shows the GNP per capita and penetration rate per 100 inhabitants for three key information infrastructure

indicators that are prerequisites for wider uptake of electronic commerce in the Asia Pacific region: computers, Internet hosts and telephone lines.

Level of development is also an important factor in determining the extent of the domestic market available for electronic commerce and the potential for success of any SME's domestically driven e-commerce strategy. Furthermore, core and periphery relations influence the relative penetration of electronic commerce in a given economy and the differential rate of adoption, uptake and use by SMEs.

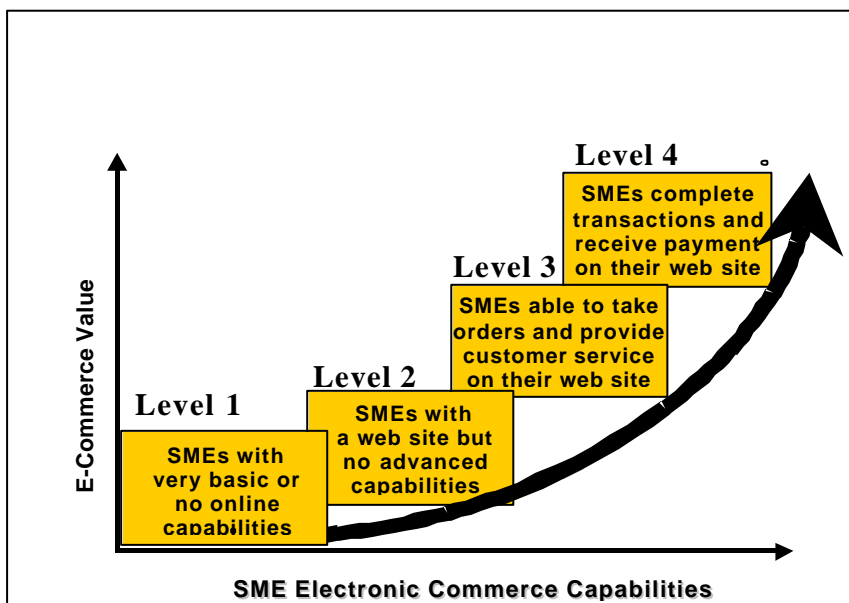
1.4.2 A Framework for Examining Differences in SME Levels of E-Commerce Capability

This study explicitly sought the opinion of SMEs that were early adopters and users of electronic commerce. While these firms may still be a minority among SMEs in many APEC economies, they are in the best position to assess the benefits and barriers to e-commerce adoption and the measures that would be most helpful. The study also aimed to examine the unique perspectives of firms at varying levels of e-commerce capability and development.

Based on the experience of PricewaterhouseCoopers in working with SMEs and in conducting similar e-commerce assignments, we employed the categorization shown in Exhibit 1.2 to examine the differences in perception between firms with different levels of e-commerce capability. These capability levels recognize that firms typically evolve through successive stages of e-commerce development, confronting different issues as they progress to higher levels of e-commerce capability and activity.

"Often SMEs equate having a web-site with electronic commerce. They set up a web-site and then don't know what to do with it. It sits there as a reminder of their failure."
Key Informant (Private Sector), Singapore

Exhibit 1.2: Four Levels of SME Electronic Commerce Capabilities



Source: PricewaterhouseCoopers

This study distinguishes between firms with lower e-commerce capabilities (Level 1 and Level 2) and those with higher capabilities (Level 3 and Level 4) as shown in Exhibit 1.2 above. These categorizations, as well as the grouping of economies by level of GNP, are used throughout this report.

Exhibit 1.3: Steps toward Enabling SME Electronic Commerce Adoption

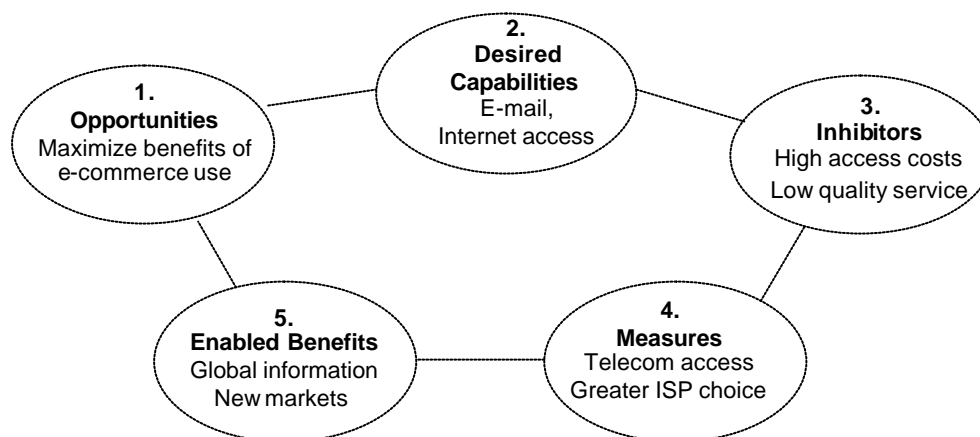


Exhibit 1.3 shows how we have looked at the adoption of electronic commerce by SMEs. This cycle has five steps, which underlie the structure of this report:

1. The cycle begins with the perception by SMEs of the opportunities and benefits offered by e-commerce, such as greater access to international markets. These perceived **opportunities and benefits** are addressed in Chapter 2 of this report.
2. Based on their perceptions of these opportunities and benefits, SMEs develop e-commerce **capabilities**. The framework we have used in categorizing e-commerce capability is described in Section 1.4.2 of this document and in Exhibit 1.2.
3. As SMEs attempt to use the e-commerce capabilities that they have developed, they experience a number of **inhibitors** to realizing the potential of these capabilities. Alternatively, their perception of these inhibitors may lead SMEs to develop less e-commerce capability than they might have done based solely on an assessment of opportunities and benefits. Inhibitors could include poor telecommunications infrastructure or gaps in the e-commerce capabilities of business partners. These inhibitors are described in Chapter 3.
4. The experiences or perceptions SMEs have with respect to opportunities and inhibitors influence what **measures** they believe should be taken by governments or other stakeholders to facilitate e-commerce adoption – such measures as improvements to the legal structure or telecommunications systems. The views of participating SMEs on required measures are described in Chapter 4.

5. Previous stages in the cycle lead to the **enabled benefits** that SMEs actually experience. These experiences, in turn, influence their perception of the potential opportunities and benefits of e-commerce usage and contribute to another cycle of e-commerce development. Specific actions to enable these benefits are suggested in Chapter 5.

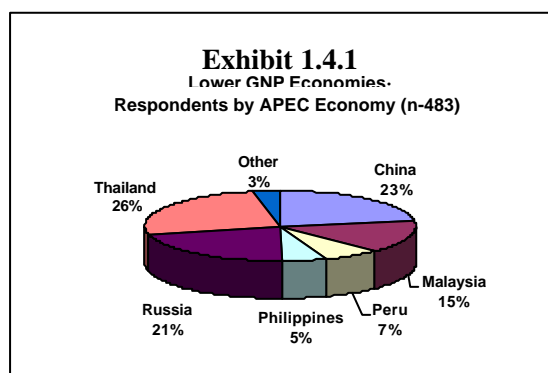
1.5 PROFILE OF SURVEY AND STUDY RESPONDENTS

As described in the previous sections, this study employed a methodology that sought the opinion of a diverse range of SMEs through multiple lines of evidence, including surveys, focus groups, key informant interviews and desk research. The result is a more comprehensive study of the perceptions and opinions of SMEs in all 21 APEC member economies than could have been accomplished using any single research technique. Throughout this report we use the results of the focus groups and surveys, complemented, supported and verified by key informant interviews and desk research, to demonstrate key findings of the study.

The exhibits below profile SME survey respondents in four ways: by economy, by sector, by size and by level of SME electronic commerce capability. These categories give a broad profile of the respondents in both lower-GNP and higher-GNP economies.

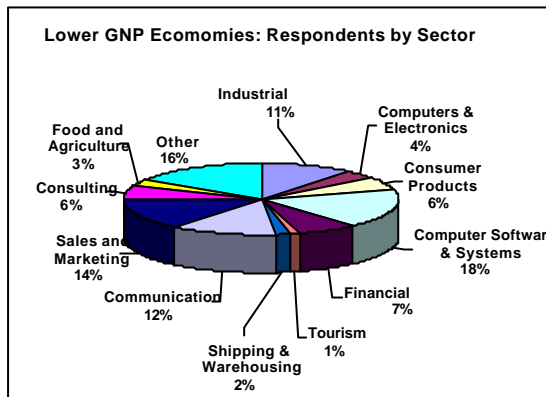
It should be recognized that the survey participants were far from a random sample, so numerical results cannot be extrapolated to the whole SME population. Many factors influenced participation in the survey, including the extent of collaboration by business associations. The specific numerical results should not be given undue weight, but they provide a convenient way of summarizing our qualitative research using quantitative analytical techniques.

1.5.1 Profile of Respondents from Economies with Lower Per Capita GNP



As shown in Exhibit 1.4.1, the response rate to the survey among lower-GNP economies was highest from Thailand, China, Russia, Malaysia, Peru and the Philippines. Survey responses were also received from Chile, Indonesia, Mexico and Papua New Guinea.

Exhibit 1.4.2

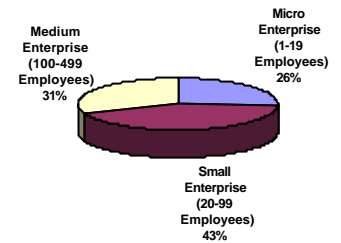


As shown in Exhibit 1.4.2, survey respondents from lower-GNP economies were widely distributed among all sectors. These sectors included: industrial products manufacturing, computers and electronics manufacturing, consumer products manufacturing, computer software and systems, financial services, tourism, shipping and warehousing (freight and passenger),

communications (telecommunications, entertainment, media and advertising), sales and marketing (retail, wholesale, distribution), consulting (engineering and business consulting), and food and agriculture. About 16% of respondents indicated they belonged to a sector other than those listed.

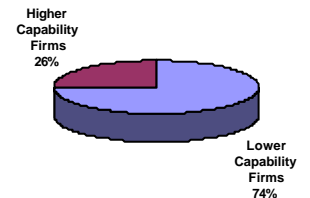
As shown in Exhibit 1.4.3, survey respondents from lower-GNP economies were broadly distributed in terms of firm size. Micro- enterprises represented 26% of the respondents and consisted of firms with between 1-19 employees. Small enterprises were the largest group of respondents, representing 43% of responses, and consisted of firms with between 20-99 employees. Medium enterprises represented 31% of respondents and consisted of firms with between 100-499 employees.

Exhibit 1.4.3
Lower GNP Economies: Respondents by Firm Size (%)



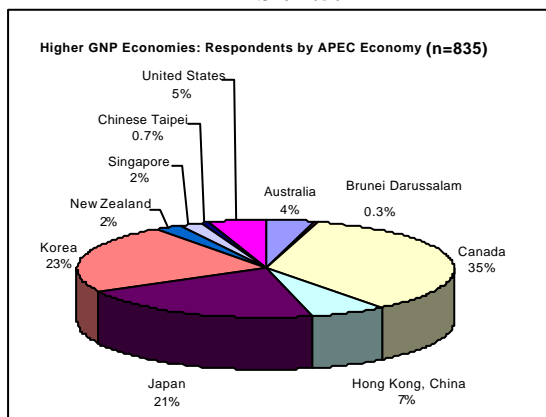
As shown in Exhibit 1.4.4, about three quarters of responding SMEs in the lower-GNP economies exhibited lower levels of electronic commerce capability while one quarter of respondents were at higher capability levels.

Exhibit 1.4.4
Lower GNP Economies: Respondents by Level of Firm E-Commerce Capability (%)



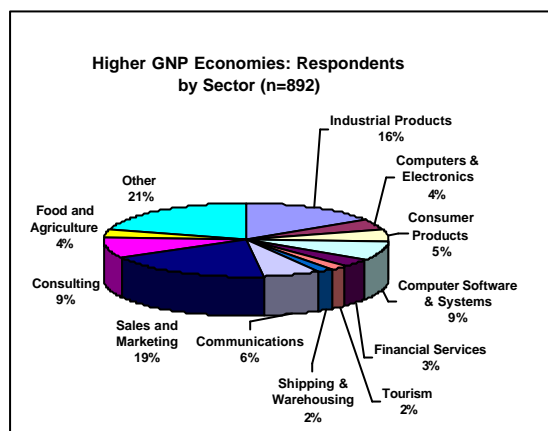
1.5.2 Profile of Respondents from Economies with Higher Per Capita GNP

Exhibit 1.5.1



As shown in Exhibit 1.5.1, the response rate for the survey from higher-GNP economies was greatest from Canada, Korea, Japan, Hong Kong-China, United States and Australia. Survey responses were also received from New Zealand, Singapore, Chinese Taipei and Brunei Darussalam.

Exhibit 1.5.2



As shown in Exhibit 1.5.2, survey respondents from higher-GNP economies were widely distributed among all sectors. Again, these sectors included: industrial products manufacturing, computers and electronics manufacturing, consumer products manufacturing, computer software and systems, financial services, tourism, shipping and warehousing (freight and passenger), communications

(telecommunications, entertainment, media and advertising), sales and marketing (retail, wholesale, distribution), consulting (engineering and business consulting), and food and agriculture. About 21% of respondents indicated they belonged to a sector other than those listed.

As shown in Exhibit 1.5.3, survey responses from higher-GNP economies were greatest from micro enterprises representing 59% of all respondents, followed by small enterprises representing 31%. Medium enterprises comprised the final 10% of total respondents.

As shown in Exhibit 1.5.4, responding SMEs in the higher-GNP economies were similar to respondents in lower-GNP economies in terms of electronic commerce capability. Firms with lower capabilities dominated the overall results, but one-quarter of respondents had higher capabilities. The apparent similarity between firms in lower- and higher-GNP economies in levels of e-commerce development is likely accounted for by the fact that survey participants in higher-GNP economies tended to come from smaller firms.

1.5.3 Focus Groups, Key Informant Interviews and Desk Research

Responses and input from focus groups and surveys provided the basis for the study results. Focus group results were particularly important in those economies where there were fewer survey responses. Key informant interviews and desk research complemented the survey and focus group results and in most instances supported and verified study data. Focus groups brought forward important issues that were not incorporated in the survey, such as the importance of payment and distribution systems as supporting infrastructure for wider adoption of electronic commerce. Research and data from the focus groups, desk research and key informant interviews are incorporated throughout this report in the form of explanations or interpretations, examples and quotes from participants.

Exhibit 1.5.3

Higher GNP Economies:
Respondents by Firm Size (%)

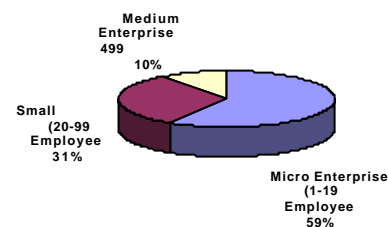
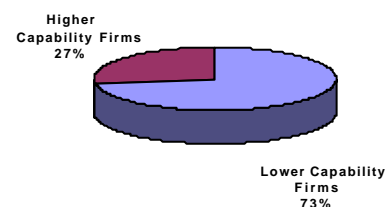


Exhibit 1.5.4

Higher GNP Economies:
Respondents by Level of Firm E-Commerce



2.0 Opportunities and Benefits of Electronic Commerce

The potential opportunities and benefits of electronic commerce for SMEs include strengthening customer relationships, reaching new markets, optimizing business processes, reducing costs, improving business knowledge, attracting investment and creating new products and services. Raising the awareness and understanding of these and other opportunities and benefits is an important means of increasing the uptake and use of electronic commerce among SMEs.

For many SMEs, electronic commerce is an exciting new opportunity with tremendous potential. It represents an opportunity to compensate for their traditional weaknesses in areas such as access to new markets and gathering and diffusing information on a broad and international scale. For others, e-commerce remains a curious notion reported in the media that, in their view, has little significance for their own enterprises and business plans. For example, key informants in Mexico suggested that one of the main factors inhibiting the adoption of electronic commerce among SMEs in Mexico is that they are not aware of the potential benefits that e-commerce can afford. Growing the awareness and understanding of the benefits and uses of electronic commerce among SMEs can positively influence their desire and interest in adopting e-commerce in their business practice.

Many SMEs identified increasing competition and expanding customer expectations as important factors influencing the development of their electronic commerce capabilities. The fear of competitors gaining an advantage through e-commerce, either by enhancing their company image or providing better customer service, was often cited as a catalyst for action in developing their capabilities. Many SMEs also noted that e-commerce could enable them to compete against larger, more established firms and in new and previously untapped markets. Many SMEs suggested that the Internet and other electronic networks were creating more sophisticated and demanding customers with higher expectations, in terms of 24-hour access to company and product information and quicker response times to information requests.

Some SMEs also noted the prominent role that government has played in encouraging and influencing the adoption of electronic commerce in their economies. For example, key informants in Singapore suggested that SME electronic commerce in Singapore is clearly being driven by the government. As part of its vision to develop Singapore into an “intelligent island”, the government has developed an electronic commerce master plan and a series of initiatives to take it forward. These include the establishment of a “cyberlaw” framework and provision of grants aimed at encouraging e-commerce uptake by local companies, as well as tax incentives for foreign companies to use Singapore as their base for their e-commerce activities in Asia. Further, key informants said that government agencies are making a coordinated effort to make Singaporeans realize its vision. Government suppliers are required to submit electronic bids

“A key factor driving the development of electronic commerce capabilities is having a good understanding of the benefits and opportunities that e-commerce can offer.”

Key Informant (Private Sector), Philippines

“Major competitors have been most influential on our efforts to develop electronic commerce capabilities. If our competitors provide e-commerce service, we have to offer it in order to compete.”

SME (Financial Services - IT Consulting), Thailand

“Customers expect 24-hour availability and faster delivery of goods and services, which is expected to be realized through the use of e-commerce.”

SME (Goods Manufacturing), Philippines

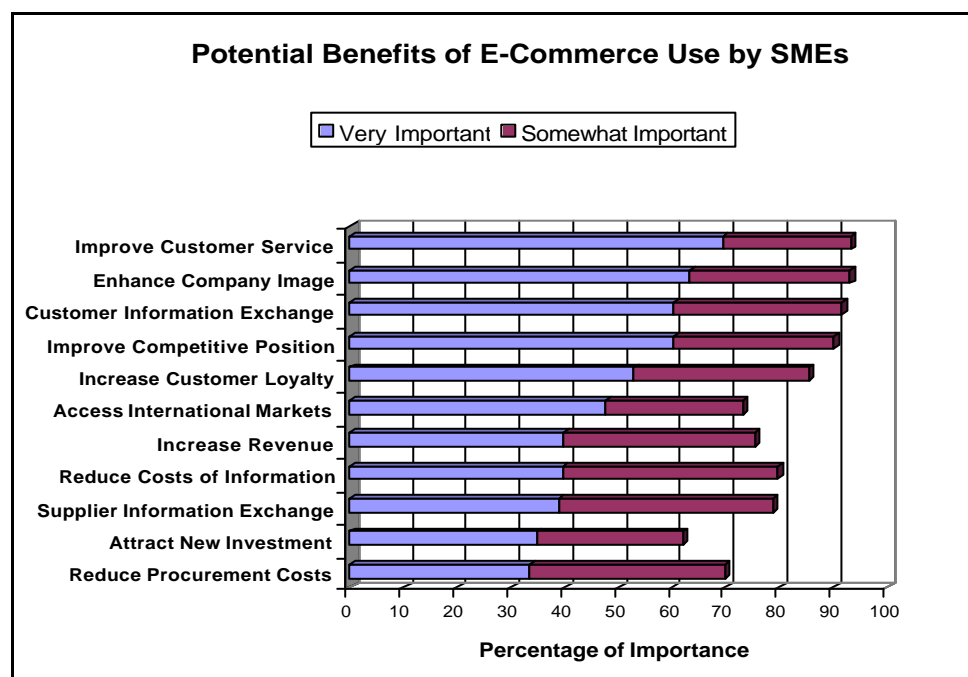
for government contracts. Households are being linked to the SingaporeONE broadband network and measures are being introduced to familiarize consumers with the use of plastic money. Educational institutions are also on board, with the two main polytechnics launching e-commerce courses and setting up centers to carry out thought leadership and research on the industry. The Department of Statistics has also been charged with measuring the performance of the e-commerce sector in terms of overall contribution to GDP.

“Government programs have been impressive in increasing the level of understanding of electronic commerce in Singapore.”
Key Informant (Research Sector), Singapore

By making electronic commerce a priority, governments are actively encouraging the diffusion of electronic commerce as a way to improve firm competitiveness and access to new markets. Initiatives reported included raising awareness, developing visions for e-commerce, cyber laws, establishing development centers and pilot projects, creating business access points, and providing education and training programs. These and other measures are discussed further in Chapter 4.

The adoption of electronic commerce by SMEs depends largely on their perception of the opportunities and benefits afforded by electronic commerce and the relevance of these opportunities to their business. As shown in Exhibit 2.1, most SMEs participating in the survey are optimistic about the potential benefits that electronic commerce can bring to their business.

Exhibit 2.1: Perceived Benefits of Electronic Commerce Use by SMEs



The most significant potential benefits of electronic commerce for SMEs include:

- Customer-focused service and information exchange is a top priority for SMEs;
- enhancing the company image and improving its competitive position is very important;
- using e-commerce to reach international markets is important for some, but not all firms; and
- increasing revenue and reducing costs through e-commerce channels is of moderate overall importance.

In Exhibit 2.2 the priority benefits of electronic commerce adoption and use are mapped according to four groups of SMEs as follows:

**Exhibit 2.2: Perceived Benefits of Electronic Commerce:
Mapping of Priorities**

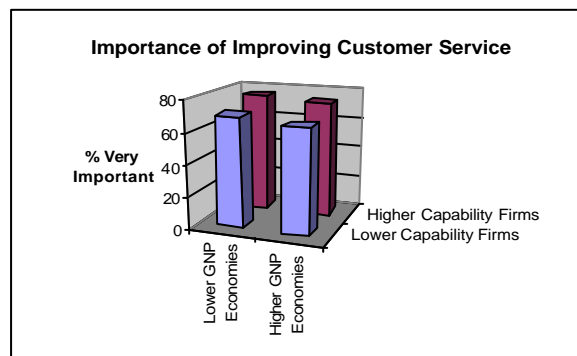
	Firms with Lower Capabilities	Firms with Higher Capabilities
Higher-GNP Economies	<ul style="list-style-type: none"> • Improve Customer Service • Enhance Company Image • Competitive Position • Better Info Exchange with Customers • Enhance Customer Loyalty 	<ul style="list-style-type: none"> • Improve Customer Service • Enhance Company Image • Better Info Exchange with Customers • Competitive Position • Access International Markets
Lower-GNP Economies	<ul style="list-style-type: none"> • Improve Customer Service • Better Info Exchange with Customers • Competitive Position • Enhance Company Image • Enhance Customer Loyalty 	<ul style="list-style-type: none"> • Better Info Exchange with Customers • Improve Customer Service • Competitive Position • Enhance Company Image • Access International Markets

“Our company is very concerned about giving our customers the information they need in the fastest way we can. Our customers must be constantly informed about new product lines, discounts and other promotions. It is important that this information reach the customer quickly, so that we can have an immediate response.”
SME (Goods Manufacturing, Medium Size), Peru

2.1 CUSTOMER SERVICE AND INFORMATION EXCHANGE

Customer-focused service and information exchange is a very important benefit of e-commerce and a top priority for nearly all participating SMEs. (See Exhibit 2.3)

Exhibit 2.3



Electronic commerce enables firms to be more responsive to customer needs and more efficient in interacting with and servicing business and consumer needs. SMEs value the fact that e-

“The Internet provides thousands of ‘virtual outlets’ to service customers.”
SME (Sales and Marketing, Micro Enterprise), Singapore

commerce enables them to offer 24-hour per day information to customers through their Internet web site and respond more quickly to customer inquiries and requests for information by email. E-commerce allows SMEs to be more targeted in their customer communications and realize more cost reductions in their advertising and product promotion. They value the ability to standardize customer information digitally and update it efficiently and at lower cost. SMEs believe that e-commerce will enable them to gather and compile better market intelligence on their customers, suppliers and competitors through Internet research and better develop and update customer databases, including online databases. By providing a higher quality of service and better information exchange with customers, SMEs believe that e-commerce will offer important benefits in improving longer-term customer loyalty and retention.

As shown in Exhibit 2.1, improving the company image and competitive position is a very important perceived benefit of electronic commerce. Many participating SMEs believe that e-commerce can enable firms to develop a presence and compete in markets that were previously untapped by SMEs. Traditional barriers such as distance, communications costs and access to international markets that prevented SMEs from competing with larger firms are not as significant. Electronic commerce can remove some of these barriers and SMEs recognize this as an important benefit of developing their e-commerce capabilities.

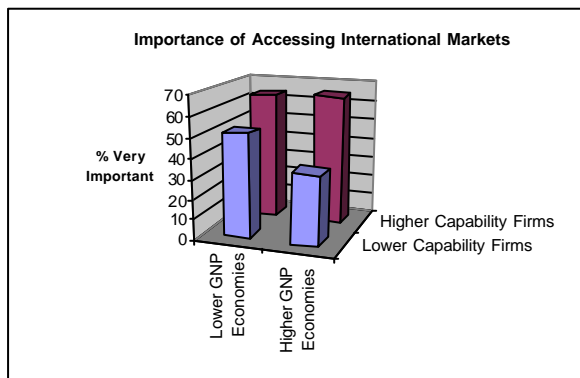
“E-Commerce provides SMEs with global reach – allowing them to reach 100 million people globally rather than just 100,000 Thai people.”
SME (Goods Manufacturing), Thailand

2.2 ACCESSING INTERNATIONAL MARKETS

As suggested earlier, using e-commerce to reach international markets is important to many participating SMEs, particularly in lower-GNP economies. (See Exhibit 2.4)

“Electronic Commerce is developing very fast in other countries. This rapid development will positively influence SMEs in Vietnam who want to do business with companies in foreign countries.”
Key Informant (Private Sector), Vietnam

Exhibit 2.4



Participating SMEs with higher levels of e-commerce capabilities were more likely to identify using e-commerce to reach international markets as an important benefit. This suggests that for many SMEs, the desire to access international markets may have an important influence on promoting the rapid

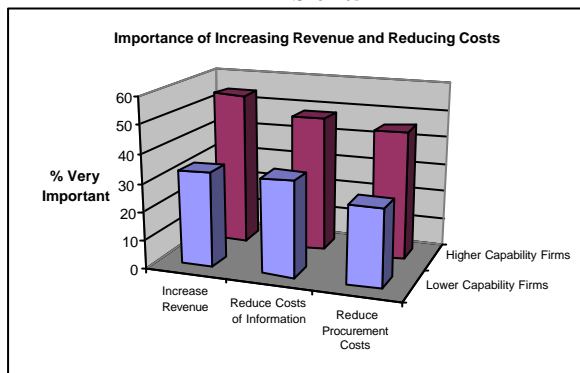
development of more advanced e-commerce capabilities. Many of these firms further noted that they were using e-commerce strategically to access international markets and had integrated the development of e-commerce capabilities as an important priority of this strategy.

“E-commerce has the potential of facilitating and speeding up export and import activities. Therefore it is expected to be a requirement if Indonesian firms are to increase their export volumes.”
Key Informant (NGO Sector), Indonesia

2.3 INCREASING REVENUES AND REDUCING COSTS

Increasing revenues through e-commerce distribution channels and reducing purchasing and information maintenance costs are of moderate importance to participating SMEs. (See Exhibit 2.5)

Exhibit 2.5



SMEs with higher levels of e-commerce capability identified using e-commerce to increase revenues and reduce procurement and information costs as a more important benefit than firms with lower capability. This suggests that SMEs with higher e-commerce capability levels may be more advanced in

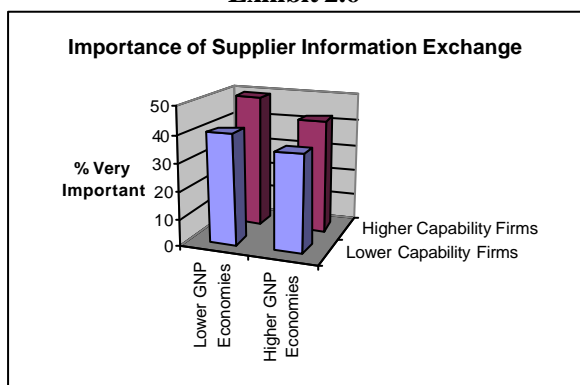
“Electronic commerce enables disintermediation. Significant cost reductions can be realized by SMEs as vendors become closer and closer to both suppliers and customers.”
SME, Australia

integrating e-commerce into their overall business models, and thus have higher expectations on revenue and cost benefits derived through e-commerce than do SMEs with lower levels of capability. Firms of this type typically use e-commerce to reduce product inventory, decrease warehousing costs or shorten sales and distribution cycles.

2.4 IMPROVING INFORMATION EXCHANGE WITH SUPPLIERS

Using electronic commerce to enhance supplier relationships and improve information exchange is of moderate importance to participating SMEs.

Exhibit 2.6



As shown in Exhibit 2.6, participating SMEs with higher levels of e-commerce capability identified using e-commerce to improve information exchange with suppliers to be a more important benefit than firms with lower levels of capability. The data suggests that this group may see better future opportunities in

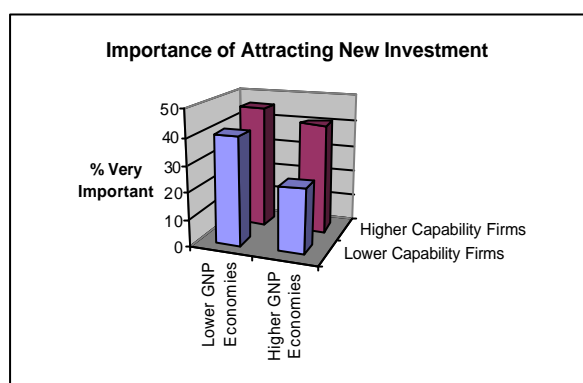
“The most advanced SMEs include the small subsidiaries and suppliers of large international companies.”
Key Informant (Government), Brunei Darussalam

business-to-business e-commerce through enhanced and more efficient supplier relationships.

2.5 ATTRACTING NEW INVESTMENT

Using electronic commerce to attract new investment to the company is of moderate importance to participating SMEs. (See Exhibit 2.7)

Exhibit 2.7



SMEs in lower-GNP economies and those with higher levels of e-commerce capability were more likely to identify using e-commerce to attract new investment as an important benefit.

In the focus groups, firms that identified attracting new investment as more important were often larger enterprises that viewed e-commerce as an opportunity to modify or significantly enhance their business model and value chain thereby enabling the firm to attract new investment more effectively. Some smaller firms, usually in the higher-GNP economies also were interested in attracting new investment in information systems (hardware, software) through e-commerce related funding programs.

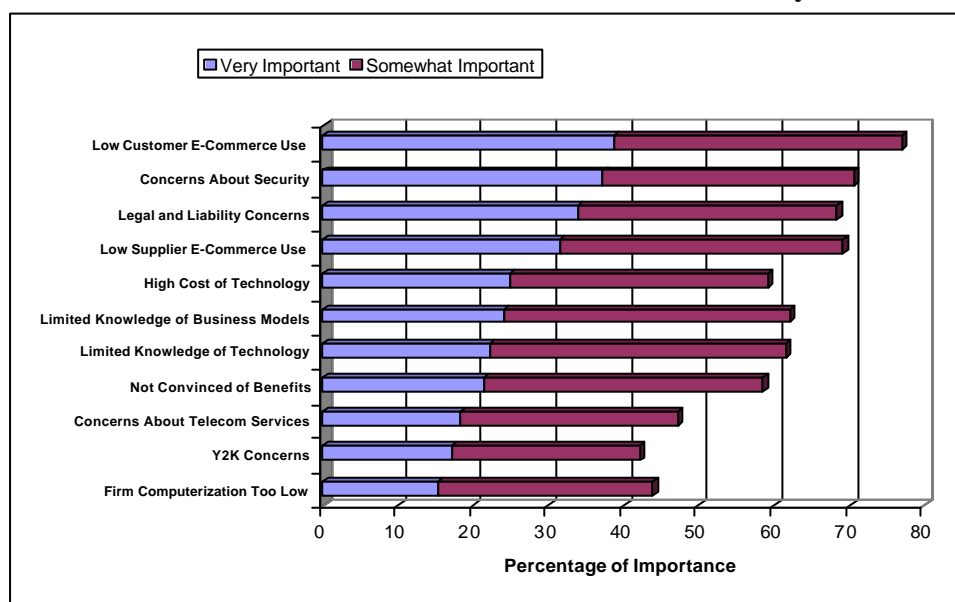
3.0 Inhibitors to the Adoption of Electronic Commerce

This section examines the perceived inhibitors to the adoption of electronic commerce by SMEs and to the achievement of the potential benefits discussed in the previous section. Factors inhibiting electronic commerce uptake by SMEs were rated according to their importance as barriers to its adoption and use.

SMEs participating in the survey generally rated the importance of these barriers well below the importance of the potential benefits. The percentage of participants who rated the various potential barriers as very important was about one-quarter, while roughly one-half of participants rated the various potential benefits of electronic commerce as very important. This is consistent with the fact that study participants were primarily early adopters of electronic commerce.

“The most critical issues to address include: developing the legal system, introducing a reliable payment mechanism and focusing on the promotion of electronic commerce to companies and consumers to build awareness and confidence.”
Key Informant
(Government), Brunei Darussalam

Exhibit 3.1: Perceived Barriers to the Use of E-Commerce by SMEs



As shown in Exhibit 3.1, the most significant barriers to electronic commerce adoption for participating SMEs in APEC member economies are:

- Low use of electronic commerce by customers and suppliers;
- Concerns about security aspects of electronic commerce;
- Concerns about legal and liability issues;
- High costs of computer and networking technologies;
- Limited knowledge of e-business models and technologies;
- Unconvinced of the benefits of electronic commerce for the company;
- and

- Quality of telecommunications services inadequate for e-commerce.

In Exhibit 3.2, the priority inhibitors to e-commerce adoption are mapped according to four groups of SMEs as follows:

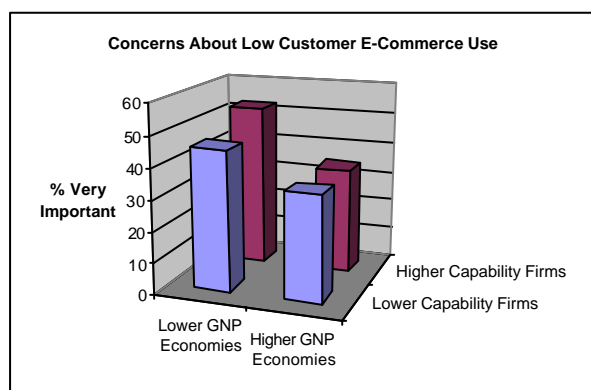
**Exhibit 3.2: Perceived Inhibitors to E-Commerce Use:
Mapping of Priorities**

	Firms with Lower Capabilities	Firms with Higher Capabilities
Higher-GNP Economies	<ul style="list-style-type: none"> • Low Customer Use • Security Concerns • Low Supplier Use • Legal Concerns • Cost of Technology 	<ul style="list-style-type: none"> • Low Supplier Use • Low Customer Use • Security Concerns • Legal Concerns • Cost of Technology
Lower-GNP Economies	<ul style="list-style-type: none"> • Legal Concerns • Low Customer Use • Security Concerns • Low Supplier Use • Lack of Knowledge of E-Commerce Business Models 	<ul style="list-style-type: none"> • Low Customer Use • Legal Concerns • Security Concerns • Low Supplier Use • Unconvinced of Benefits

3.1 LOW CUSTOMER AND SUPPLIER USE

The perceived opportunities for SMEs to improve customer and supplier support and sales through electronic commerce (identified in Section 2.1) are limited by various factors in the electronic marketplace. The factor most often cited as a limiting factor to the use of e-commerce by participating SMEs in the survey was the low use of electronic commerce by the firm’s main customers.

Exhibit 3.3



As shown in Exhibit 3.3, concern about low customer use of e-commerce was somewhat higher overall in lower-GNP economies. This may be due, in part, to the less developed domestic market for electronic commerce in many of these economies. Until sufficient numbers of their main local customers or suppliers

participate in online commerce activities, there is little incentive for individual SMEs to become engaged in electronic commerce themselves. For example,

“The infrastructure here in China is far behind that of foreign countries, and online shopping is far from popular. There is no point developing e-commerce if consumers are not willing to shop online.”
SME (Services), China

“Because of the limitations of the domestic market, some companies have developed the international market first.”
SME (Services), Vietnam

focus group participants in Chinese Taipei cited several factors contributing to low levels of customer electronic commerce use in Chinese Taipei including: language barriers and low levels of English fluency, lack of comfort and familiarity with electronic commerce technologies, a cultural preference for more traditional trade practices involving face-to-face contact between buyer and seller, and continued preference for the use of cash in transactions. As a result, they believed many SMEs in Chinese Taipei were choosing to take a “wait and see” attitude toward electronic commerce. In another example, focus group participants in Japan said that consumers still choose mail order shopping over Internet shopping because the price is comparable, the catalogue is more attractive and the payment systems are more traditional.

“The main risk is that people don’t trust electronic commerce or the technical infrastructure to support it.”
Key Informant (NGO/ Academic Sector), Peru

Firms may attempt to overcome these potential barriers in the short term by seeking to access international markets directly, using electronic commerce channels to sell their products or services to foreign customers. This strategy may be more feasible for medium-sized firms and firms that have already gained some experience in the international marketplace.

“Security is very important because of the confidence and support that people must have to even begin to use electronic commerce.”
SME (Services Sector), Peru

3.2 TRUST AND CONFIDENCE

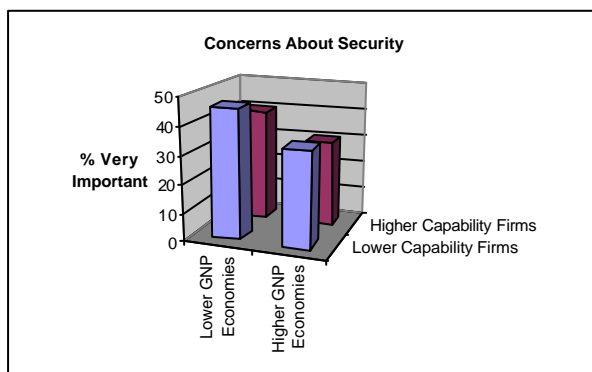
Lack of trust and confidence in various aspects of the electronic marketplace was identified as an important inhibitor to the growth of the electronic commerce market in general, and for SME engagement in e-commerce in particular. Security, legal and liability issues were often identified as very important concerns of participating SMEs.

“In conducting business to business e-commerce we know the people that we contact – we can verify them. On the other hand, for business to consumer e-commerce confidentiality and security issues are more important.”
SME (Financial Services), Thailand

3.2.1 Security Issues

Concerns about security issues around the use of electronic commerce were very important for many participating SMEs. However, as shown in Exhibit 3.4, the level of relative concern with security appears to decrease as firms become more advanced and gain a better understanding of security issues and the appropriate technologies to address them.

Exhibit 3.4



This issue is particularly apparent for SMEs in the lower-GNP economies, where firms that have developed higher e-commerce capabilities, including on-line ordering or transaction capabilities through their web sites, indicate less concern about security than those firms

“I find that the question of security is not so important. The problem of credibility, on the other hand, is extremely relevant. If Chileans start to do business on the Internet and acquire a reputation for being ‘tricky’ the whole thing will die out for a problem of credibility.”
SME (Services), Chile

with fewer e-commerce capabilities, suggesting that, while security presents an obstacle to the further development of SME e-commerce capability that must be addressed, it is not insurmountable. Firms are less concerned about security once they become engaged in transaction related e-commerce and take appropriate security measures. For example, focus group participants in Canada said that concerns about security are more of a “speed bump” rather than a real barrier to electronic commerce. They highlighted the fact that as their firms developed more advanced electronic commerce capabilities and knowledge they became more aware of security technologies and less concerned about it as a barrier. In Australia, key informants also said that security is a problem of perception, noting that perceived risk could still have a big impact on SMEs, particularly as it relates to consumer confidence.

“Security is frequently cited as a problem, but it is not a real problem in Singapore. It’s more of a psychological barrier.”
Key Informant
(Government), Singapore

3.2.2 Legal and Liability Issues

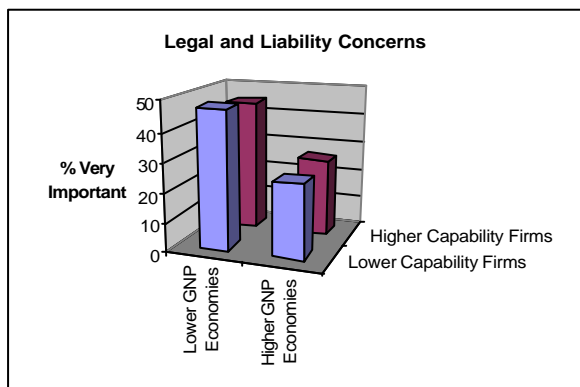
Several legal and liability issues need to be addressed to ensure that electronic commerce is widely accepted and used by SMEs and others in the APEC marketplace. Conducting business through electronic networks raises numerous legal questions that include: the legal status and enforceability of electronic contracts; the legal jurisdiction of international electronic commerce transactions; intellectual property rights and copyright protection for digital content; the privacy of personal data; and the validity of electronic “evidence” in legal disputes.

“The idea of having a stranger or hacker being able to access my information and copy it is extremely dangerous.”
SME (Industrial Products Manufacturing), Peru

Concerns about legal and liability issues are very important to participating SMEs. As shown in Exhibit 3.5, SMEs in lower-GNP economies appear to be significantly more concerned about legal and liability issues than similar firms in higher-GNP economies.

“SMEs are still confused about the legal issues surrounding electronic commerce.”
Key Informant (Private Sector), Indonesia

Exhibit 3.5



This concern may be due, in part, to a relative lack of adequate legal infrastructure for electronic commerce in some lower-GNP economies. This issue is further reflected in Chapter 4, as firms in lower-GNP economies place a higher degree of importance on the need for government to put in place the appropriate legal framework and infrastruc-

“Smaller businesses have more of a concern about .”
Key Informant (Private Sector), Indonesia

ture, and reduce the perceived legal barriers to e-commerce. For example, focus group participants in Russia said that electronic commerce has an almost “illegal” perception or status because of the absence of legislation including the lack of a formal legal definition of electronic commerce and problems with the certification of telecommunications service providers and ISPs.

Legal issues identified by SMEs in order of priority included: the validity and legal enforcement of contracts; protection of intellectual property; legal protection in disputes arising from ecommerce activities; and other liability issues. For example, focus group participants in Japan said that development of the legal framework for electronic commerce is well behind developments in technology. They also expressed concerns about international legal protection such as global patent applicability, global taxation and consumer protection.

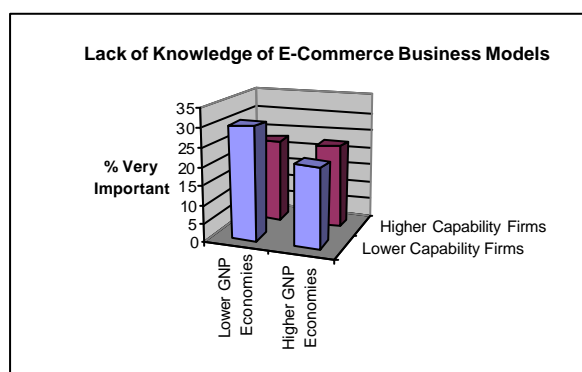
3.3 INTERNAL FIRM CAPACITIES AND ISSUES

Internal limitations in firm capacities are constraining wider adoption of e-commerce by SMEs. Internal limitations most often cited by SMEs as inhibitors included lack of knowledge of e-commerce business models and e-commerce technologies, internal resistance to change, and skepticism of the benefits of e-commerce for the firm.

3.3.1 Limited Knowledge of E-Commerce Business Models and Technologies

Successful SME e-commerce business models are emerging from the practical implementation of electronic commerce in response to perceived opportunities in the marketplace. Some of these new models imply fundamental shifts in business strategies, operations and technologies. Many participating SMEs indicated that they have limited access to information about the business models and technologies that are the basis of e-commerce success. As shown in Exhibit 3.6, this was of particular concern to lower-capability SMEs in lower-GNP economies where there was generally more limited understanding and awareness of e-commerce and successful SME examples. Firms had difficulty demonstrating a positive return on investment (ROI) to justify their investment in e-business implementation.

Exhibit 3.6



to SMEs in adopting electronic commerce is accessing knowledgeable staff and

“It is a mistake to consider the problem of the development of electronic transactions and networks merely as a cultural problem. It is a learning problem similar to the introduction of computers into companies. The arrival of the Internet is more of a change in work practices than a cultural change.”
Key Informant
(Government), Chile

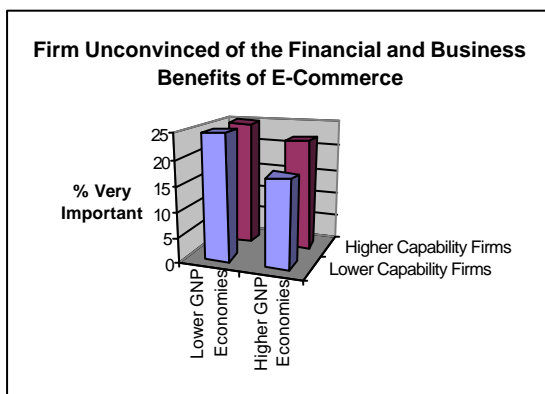
“Electronic commerce will only be successful if there is a successful electronic business model. In order to reduce the business risk, SME owners should be creative and look at their business at a high level. Don’t look at one-to-one mapping of old ways and electronic ways because that’s missing the bigger picture. The whole business model may need to change.”
Key Informant (Financial Services), USA

experts in support of their efforts to develop a new business model around electronic commerce – and fully benefit from integrating it more substantially in their company’s operations and marketing.

3.3.2 Firms Unconvinced of the Benefits

Some respondents indicated that they were unconvinced of the benefits of electronic commerce. Interestingly, as seen in Exhibit 3.7, a larger percentage of firms in lower-GNP economies, and higher-capability SMEs in higher-GNP economies, indicated that they were not as convinced of the benefits of e-commerce as their corresponding lower-capability SMEs. This disparity might indicate that results from the early adoption of electronic commerce capabilities did not always live up to expectations, perhaps due to low customer use in domestic markets, or lack of integration into firm business models. Alternatively, higher-capability firms may be considering larger electronic commerce investments that could result in greater internal discussion of the business case. In Vietnam, for example, key informants suggested very few initiatives have been taken to develop the use of electronic commerce among SMEs, noting that private enterprises still do not see the benefits and return on investment in the near future and have therefore adopted a passive position. Key informants said that private enterprises in Vietnam believe that the “IT-environment” is not sufficiently developed to allow them to invest in the promotion of electronic commerce.

Exhibit 3.7



An issue often cited by participating SMEs and key informants was the general lack of success stories available to demonstrate that electronic commerce can be successfully implemented by firms that are similar in some way to their own. Addressing this need might take the form of electronic commerce best practices for SMEs and case studies examining critical

“SMEs who want to develop electronic commerce have difficulty finding information on success stories.”
Key Informant (Private Sector), Japan

success factors in the implementation of electronic commerce.

However, the relative success of a firm’s e-commerce activities is not always evident from web site analysis alone. As noted by a key informant in China, “It’s difficult to get successful examples, because these companies are unwilling to share their stories in such a competitive environment. They fear that there will be many followers that will copy their ideas and approaches overnight if they disclose their tips on e-commerce.”

Indeed, the web itself is a potent source of information about the electronic commerce activities of other firms, particularly for business-to-consumer e-commerce.

3.4 INFORMATION INFRASTRUCTURE ACCESS, QUALITY AND COST

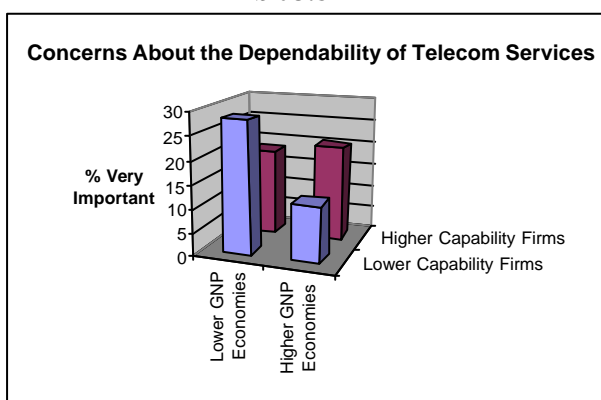
Insufficient access to appropriate information infrastructure of suitable quality, and at reasonable cost, is a fundamental barrier to SME adoption and use of electronic commerce. The information infrastructure required for electronic commerce involves dependable telecommunications links and Internet services being available to SMEs.

As shown previously in Exhibit 1.1, the availability of information infrastructure to support electronic commerce applications differs greatly among the APEC economies, with lower-GNP economies generally having more limited infrastructure than higher-GNP economies. Therefore, one might expect that concerns about quality of available telecommunications service should be of particular concern in lower-GNP economies.

3.4.1 Quality and Dependability of Telecommunications Services

As shown in Exhibit 3.8, concern about telecommunications quality is much stronger among the lower-capability SMEs than the higher-capability SMEs in lower-GNP economies. This difference might be explained by differences in quality of service within these economies: firms with a higher quality of telecommunications access may be using this capacity to become more advanced, while other firms with limited quality access view this factor as a critical barrier to their adoption of e-commerce.

Exhibit 3.8



New e-commerce applications often place increasing demands on existing available infrastructure, and create demand for increased bandwidth both at the level of the firm and also in local and international telecommunications networks. For example, focus group participants in the United States noted

that the high cost of expanded bandwidth is a limiting factor for the adoption by SMEs of more sophisticated electronic commerce capabilities, noting that this

“E-commerce is clearly essential to sustain company competitiveness in the medium -long term. The private sector will be forced to do e-commerce business. Infrastructure and regulation are the key barriers needed to be solved.”
Key Informant (Private Sector), Thailand

“From an information and communications infrastructure standpoint, Russia is as a series of ‘islands’ with decent infrastructure on each individual island. However, the infrastructure between the islands is poor and inhibits the capability of individual islands to communicate with one another. For example, there are good infrastructures in Moscow and St. Petersburg, but the connection between them is bad.”
Key Informant (Private Sector), Russia

“The infrastructure in Thailand is poor. Telecommunications has a high disconnection rate. If it is disconnected when we are doing a transaction we have to do it again and sometimes the order is duplicated by doing this.”
SME (Services Sector), Thailand

issue will become increasingly important as consumers come to expect more advanced content and applications from e-commerce vendors.

3.4.2 Payment and Delivery Systems

SMEs in the focus groups also identified the importance of having the appropriate supporting payment and distribution systems in place for the adoption of electronic commerce.

The availability of electronic payment systems that enable value to be transferred from one organization to another was a factor often cited by SMEs in the focus groups as limiting the development of electronic commerce. This factor was particularly evident in the lower-GNP economies where the development of electronic payment systems, including the use of credit cards, is limited. SMEs noted relatively low credit card penetration among consumers in lower-GNP economies as a domestic constraint to business-to-consumer e-commerce development. In another focus group, participants in the Philippines said that legislation to enable electronic signatures is essential. They noted that electronic credit card transactions could be made possible even without the law in place since the security technology already exists. However, they also pointed out that in many cases it is more the “mindset” which inhibits the adoption of online credit card payment. Credit card companies are concerned about fraudulent transactions, and their inability to track down suspicious transactions while consumers are concerned about illegal usage of their accounts by Internet hackers. They believed that these perceptions are founded on lack of awareness of current security technologies.

Some SMEs also noted the dependence of e-commerce on domestic distribution and postal delivery systems. Consumers who shop on the Internet expect speedy delivery and reliability of service that depends considerably on postal delivery and other distribution channels. E-commerce development may be constrained if these delivery mechanisms are not adequate.

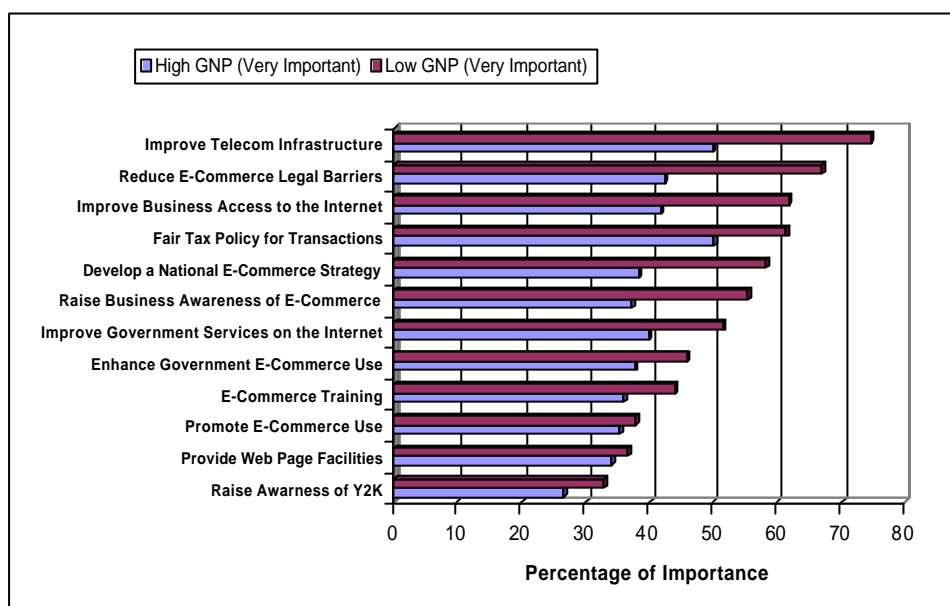
“The postal system needs to be improved upon to fully use e-commerce. Due to the limitations of the postal service, businesses all use couriers for their postal delivery needs, and this is costly.”
Key Informant (Private Sector), Papua New Guinea

“E-commerce is dependent on the postal service. The person who is ordering goods through the computer is the type who is used to getting quick results, thus real development of e-biz in Russia is dependent on the quality and service of the postal service as much as on quality telecommunications.”
SME (Goods Manufacturing), Russia

4.0 Measures to Encourage the Adoption of Electronic Commerce by SMEs

Participating SMEs identified several measures to address perceived barriers and thus to encourage wider adoption and use of electronic commerce. The most important measures to be taken by government or others identified by SMEs are shown in Exhibit 4.1.

Exhibit 4.1: Measures to Increase Electronic Commerce Use among SMEs



This chart also shows that participating SMEs in lower-GNP economies are particularly convinced of the importance of government action. SMEs believe government has an important role to play in many areas in the development of electronic commerce, particularly in improving telecommunications infrastructure, business access to the Internet and addressing the legal and regulatory issues surrounding the use of electronic commerce. Focus group participants often referred to the government's role in a variety of ways such as leader, promoter, facilitator, regulator, educator and financier. While many SMEs believed that the government's main role should be that of a facilitator, SMEs in lower-GNP economies typically placed a significantly higher degree of importance on the role of government in the development of their own electronic commerce capabilities. For example, key informants in Malaysia suggested that the government plays, and will continue to play an important role in leading the adoption of electronic commerce amongst SMEs. By setting up the National Framework for E-Commerce, the Malaysian government is attempting to address important e-commerce issues such as infrastructure, security, cyber laws, customs and taxation, finance and trade. Further, key informants suggested that there is a growing emphasis on government agencies working collaboratively

with trade associations and private companies to come up with new initiatives in support of the adoption of electronic commerce.

Differences in SME perceptions of the role that government should play, and the types of measures to be taken, are more related to the type of economy than the level of firm e-commerce capability. A mapping of the priority measures to encourage e-commerce adoption is shown in Exhibit 4.2.

Exhibit 4.2: Measures to Encourage the Adoption of E-Commerce: Mapping of Priorities

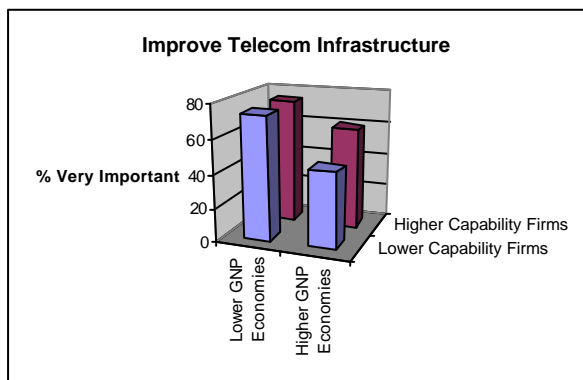
	Firms with Lower Capabilities	Firms with Higher Capabilities
Higher-GNP Economies	<ul style="list-style-type: none"> • Ensure a Fair Taxation Policy • Improve Telecom Infrastructure • Reduce Legal Barriers • Improve Business Access • Improve Government Services 	<ul style="list-style-type: none"> • Improve Telecom Infrastructure • Ensure Fair Taxation Policy • Improve Business Access • Reduce Legal Barriers • Improve Government Services
Lower-GNP Economies	<ul style="list-style-type: none"> • Improve Telecom Infrastructure • Reduce Legal Barriers • Improve Business Access • Ensure Fair Taxation Policy • Develop a National EC Strategy 	<ul style="list-style-type: none"> • Improve Telecom Infrastructure • Reduce Legal Barriers • Improve Business Access • Ensure a Fair Taxation Policy • Raise Business Awareness

“The lack of infrastructure for and credibility of electronic commerce transactions in Thailand makes business-to-consumer e-commerce a lot more difficult than business-to-business e-commerce.”
SME (Goods Manufacturing), Thailand

4.1 IMPROVING THE INFORMATION INFRASTRUCTURE

Measures to improve the information infrastructure, including the telecommunications infrastructure are rated as very important and a top priority for many participating SMEs. (See Exhibit 4.1 and Exhibit 4.3)

Exhibit 4.3



SMEs in lower-GNP economies and those firms in higher-GNP economies with more advanced e-commerce capabilities identified measures to improve the telecommunications infrastructure as a priority. This suggests that many SMEs in lower-GNP economies, regardless of the firm’s level of capability in

“The government should promote an open and competitive telecommunications industry in the country.”
Key Informant (Public Sector), Mexico

electronic commerce, perceive the telecommunications infrastructure as not sufficiently advanced to support their adoption and use of e-commerce. Specific infrastructure measures frequently cited included encouraging competition in the telecom industry, reducing ISP connection and communication costs, and developing and improving access to the Internet.

The high importance afforded by more advanced firms in higher-GNP economies to improving the telecommunications infrastructure, as shown in exhibit 4.3, may suggest that these firms are pushing current capacities in terms of bandwidth, speed and application sophistication. As a result, they are looking to government and others to take measures towards improving and enhancing the development of the information highway and the supporting telecommunications infrastructure.

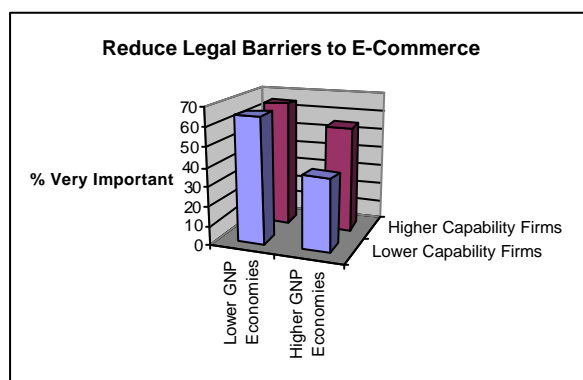
The development of payment systems to support electronic commerce transactions, either through credit cards or other means, was identified by many SMEs in lower-GNP economies as important to the wider adoption and use of e-commerce. Measures to put in place appropriate payment systems were therefore believed to be important, and included adopting measures to increase credit card penetration among consumers and developing the legal framework to support the acceptance of credit card transactions without signatures.

4.2 DEVELOPING A LEGAL FRAMEWORK

The development of a legal framework to support electronic commerce is an important step towards reducing uncertainties and building trust and confidence in the electronic marketplace.

As seen in Exhibit 4.4, measures to reduce the legal barriers for electronic commerce are seen as particularly important to the development of electronic commerce in lower-GNP economies. (See Exhibit 4.4)

Exhibit 4.4



Participating SMEs in higher-GNP economies were also particularly concerned with the development of fair taxation policies for e-commerce transactions. Issues to be addressed might include: what taxes should apply to Internet transactions, the identification and residence of users, the tax

"The appearance of the Internet created a panorama of confusion in the telecommunications industry, generating strong incentives for telephone companies to stop or at least restrain its development."
Key Informant (Private Sector), Chile

"Most business would be happy if the government developed an e-commerce legal framework."
Key Informant (Private Sector), New Zealand

In particular, measures to address the following issues were considered important by participating SMEs: validity and enforcement of contracts; intellectual property protection; legal recourse mechanisms in disputes; and liability issues.

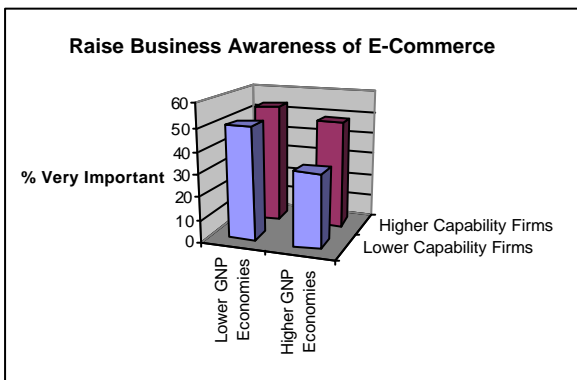
collection implications of the loss of intermediaries in transactions, and the problem of tax avoidance.

4.3 RAISING BUSINESS AWARENESS OF ELECTRONIC COMMERCE

A key factor influencing the adoption and use of electronic commerce by SMEs is increasing the awareness and understanding of the benefits and opportunities that electronic commerce can offer SMEs. Measures to increase awareness of the relevance of e-commerce to the SMEs' businesses, and of the capacity of electronic commerce to help increase customer service, competitiveness, productivity and market access are rated as very important by many participants. (See Exhibit 4.5)

Participating SMEs in lower-GNP economies and those firms in higher-GNP economies with more advanced e-commerce capabilities identified measures to raise business awareness as more important, suggesting that there is perhaps a more limited of an understanding of e-commerce among SMEs in lower-GNP economies, and therefore a greater need to raise business awareness.

Exhibit 4.5



It should be noted that participating SMEs in lower-GNP economies were also more likely to cite lack of customer and supplier capability as an impediment to achieving the benefits of electronic commerce. The importance afforded by more advanced firms in higher-GNP economies may suggest an expanded awareness among these SMEs that most electronic commerce is business-to-business, and that greater opportunities exist for SMEs if more firms are engaged and part of the larger e-commerce business network.

4.4 IMPROVING BUSINESS ACCESS TO THE INTERNET

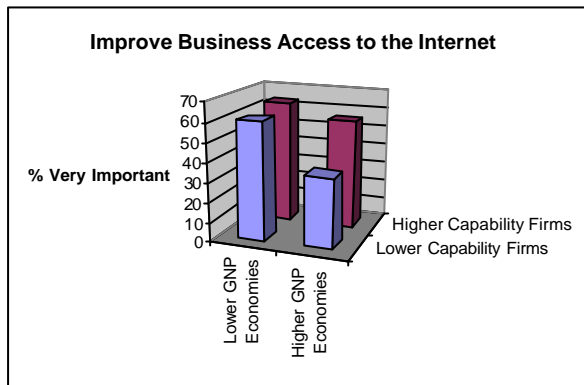
The importance afforded by SMEs to improving business access to the Internet reveals a similar connection to the importance of raising business awareness. (See Exhibit 4.6)

"Many SMEs tell us they don't have time for electronic commerce but this usually means they don't have the knowledge and 'comfort level' to pursue an e-commerce strategy."
Key Informant
(Government) USA

"There is a need for better information. There is not enough being done to ensure that the general business community understands all the issues relating to the use of e-commerce, especially what the government is doing. This has to be done in simple terms and not in technical jargon."
SME (Financial Services),
Malaysia

"A real effort needs to be made to highlight successful e-commerce experiences by SMEs."
SME (Services Sector),
Philippines

Exhibit 4.6



Participating SMEs in lower-GNP economies and those firms in higher-GNP economies with more advanced e-commerce capabilities identified measures to improve business access to the Internet as more important. This suggests that there may be limited penetration of ISP hosts and Internet

“No particular industry or sector is advanced, however typically it is the larger firms who are more aware and have the money, marketable products and the business plan for EC that are more capable of and advanced in electronic commerce.”
Key Informant (Government), Philippines

applications among SMEs, perhaps due to restrictions such as high cost of connection rates and limited access points in lower-GNP economies. Again, the importance afforded by more advanced firms in higher-GNP economies may suggest an expanded awareness among these SMEs that most electronic commerce is business-to-business and that greater opportunities exist for SMEs if more firms are engaged as a part of the larger e-commerce business network.

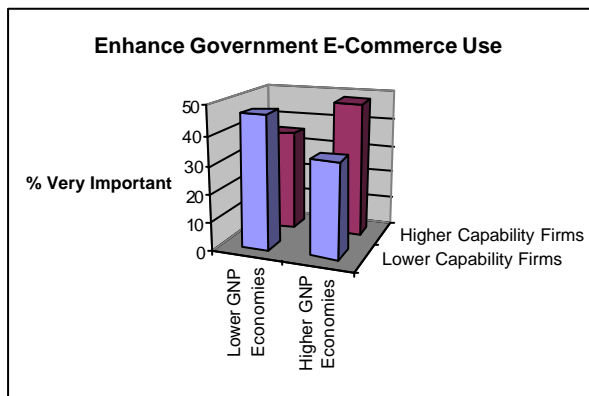
“We need success stories about small and medium-sized companies, not just the secrets of large companies like WalMart and Amazon.com.”
Key Informant (Private Sector), United States

Some examples of measures identified by SMEs to raise business awareness of electronic commerce and improve business access to the Internet included: awareness programs, education and training, establishing development centers and pilot projects and creating business access centers and points of contact.

4.5 ENHANCING GOVERNMENT E-COMMERCE USE AND SERVICES

Enhancing government use of electronic commerce is an important priority for a moderate number of participating SMEs. (See Exhibit 4.7)

Exhibit 4.7



SMEs with higher levels of e-commerce capability in higher-GNP economies identified enhancing government use of electronic commerce as more important, suggesting that more advanced firms with expanded capabilities to facilitate e-commerce transactions are looking more and more to the government as a potential

“Government should focus on moving some of the government services (i.e. payment of utilities and phone bills) onto the Internet and move toward a paperless system of payment for government services.”
SME, Brunei Darussalam

business customer and/or e-commerce partner. Many of the participating firms in this category identified governmental use of e-commerce for purchasing and

procurement as an important priority and potential driver for the wider adoption and use of electronic commerce by SMEs.

Some participating SMEs also identified improving government services on the Internet – such as information products, advisory services and business networking facilities – as an important measure to increase the adoption and use of electronic commerce. Many of the firms participating in this study suggested that the provision of these services should be SME-focused, “business-friendly” and developed in cooperation with SMEs and other business partners. Government e-procurement initiatives were often cited as important initiatives and useful examples for SMEs.

4.6 BUILDING FIRM-WIDE E-COMMERCE CAPACITIES

Building firm-wide electronic commerce capacities through education, training and skills development is an important enabling condition for the diffusion of electronic commerce in SMEs. Training and skills development involves an important cost to SMEs, but builds awareness of electronic commerce, and can facilitate the shift from awareness to implementation. Many participating firms identified the need for e-commerce success stories to demonstrate that electronic commerce can be successfully implemented by firms that are similar in some way to themselves. This might take the form of electronic commerce best practices for SMEs and case studies examining the critical success factors in the implementation of electronic commerce. Indeed, the web itself is a potent source of information about the electronic commerce activities of other firms.

“The most important thing for the development of e-commerce within the SME population is the development of a track record of success stories. SMEs don’t want to be guinea pigs. They need proven, everyday successes.”
Key Informant (Private Sector), United States

5.0 Concluding Remarks and Suggestions for Further Research

This study represents a significant and important undertaking by Asia Pacific Economic Cooperation and PricewaterhouseCoopers to examine the adoption and use of electronic commerce by small and medium enterprises in all 21 APEC member economies. It employed qualitative methods, reinforced by quantitative techniques, to elicit the views and perceptions of a wide range of SMEs with regard to potential opportunities, benefits and perceived barriers to the adoption and use of electronic commerce. It also sought the opinion of SMEs as to measures that might be taken – by government or by others – to encourage and stimulate the further adoption of electronic commerce throughout the APEC region.

The analytical framework we used enabled us to explore and examine the similarities and uniquely different perspectives between SMEs in different groups of APEC economies, and at different levels of e-commerce capability.

The level of interest and participation in this study has shown that there are SMEs in all APEC economies that are early adopters of e-commerce and that take a strong interest in its further development. These SMEs believe that the potential benefits of e-commerce significantly outweigh the disadvantages and risks. They welcome the involvement of APEC economies in addressing these inhibitors and facilitating e-commerce adoption through a wide range of measures. The study also demonstrates significant commonalities among the APEC economies in terms of SME decision-making and attitudes, suggesting that further involvement by APEC in e-commerce issues will be welcome and constructive.

5.1 ACTIONS BY INDIVIDUAL APEC MEMBER ECONOMIES

Our research confirms that SMEs in the APEC economies believe that governments have an important role to play in enabling firms to be competitive by promoting the development of electronic commerce. Measures identified by the study to be taken by individual APEC economies might include the following:

- **Developing the telecommunications infrastructure** to improve business and consumer access to the Internet and to electronic commerce. This action was identified to be of particular importance for SMEs from lower-GNP economies. Specific initiatives might include measures to encourage the development of Internet Service Providers (ISPs), liberalization and regulatory reform to increase competition in the provision of telecommunications services and encourage lower rates and service innovation.

- **Enhancing the climate for investment** including measures to attract and retain venture capital and investment in SMEs with potential for rapid growth. SMEs that could benefit from this type of investment include new start up e-business firms and other more traditional enterprises that are now implementing their electronic commerce strategies.
- **Enhancing the domestic market for electronic commerce.** This step might include measures to ensure consumer and supplier access to the Internet and to appropriate electronic payment systems, the enhancement of consumer protection, and the maintenance of business ethics and good business practice in electronic commerce.
- **Addressing legal and liability concerns** including measures to strengthen the domestic legal framework, such as: ensuring the validity and enforcement of contracts, intellectual property protection including copyright and trademark protection, and legal recourse mechanisms in disputes.
- **Addressing security issues** to build trust and confidence in the electronic marketplace, including measures to ensure the authenticity of electronic documents, and the privacy and confidentiality of personal and corporate records.
- **Ensuring that fair taxation** is applied to electronic commerce transactions including measures to ensure that transactions, conducted via electronic commerce receive neutral tax treatment relative to non-electronic transactions.
- **Raising business awareness of electronic commerce,** including measures to promote greater awareness of the opportunities and benefits of electronic commerce for SMEs, such as training and skills development programs, and the distribution of best practices.
- **Enhancing government use of electronic commerce,** including measures to promote government use of e-commerce in areas such as government procurement and the provision of government services that encourage the wider adoption of e-commerce among SMEs and other firms. While participants varied in their recognition of its value, we believe that government can play an important role as a model user. Further, Governments in lower-GNP economies may be able to benefit from the lessons learned by those in higher-GNP economies as they implement electronic commerce in their dealings with both businesses and consumers.

5.2 MULTILATERAL POLICY AND PROGRAM DEVELOPMENT

Collective measures may be undertaken by APEC as a whole, or by groups of APEC member economies, to enhance the environment for electronic commerce and support its adoption by SMEs and other users across the APEC region.

Although the participants in this study were not specifically asked about the role that multilateral organizations such as APEC might play in assisting SMEs to develop their electronic commerce capabilities, we have several suggestions for collective measures. They are based on data gathered on issues related to electronic commerce in our surveys, focus groups and desk research, as well as our previous experience with APEC and other multilateral organizations. These collective measures could include:

- **Improving the information infrastructure for electronic commerce** across the APEC region. This measure might include enhanced efforts to implement Asia Pacific Information Infrastructure (APII) programs, and other programs that help to develop the common APEC information infrastructure required for regional and global electronic commerce for SMEs and all other users.
- **Ensuring that common and beneficial trade policies are enacted** for cross-border electronic commerce transactions. This step includes collective measures to ensure that customs duties and tariffs are not unfairly applied to these transactions, as well as measures to ensure that customs documentation can be received and accepted in electronic form.
- **Ensuring that fair taxation is applied across jurisdictions**, and that value-added tax (VAT) in particular is transparent and consistent when applied to electronic commerce transactions for SMEs and others.
- **Developing and maintaining common standards** to facilitate electronic commerce among APEC members, including collective measures to facilitate an international, voluntary and consensus-based environment for standards-setting wherever appropriate.
- **Addressing issues of trust and confidence** in international electronic commerce transactions, including measures to address legal and security concerns that are international in character.
- **Building electronic commerce capabilities among SMEs** through seminars, workshops, training or other activities that build awareness of the electronic commerce issues and concerns of SMEs identified in this report.

APEC could support the development of electronic commerce for SMEs by developing collective programs, measures or activities related to any of the individual or collective measures identified above for all APEC economies, or for a group of economies with particular interests or needs. The accelerating development and proliferation of electronic commerce activities globally will have an increasing impact on multilateral policy and program development. Continued emphasis by APEC and other multilateral organizations on electronic commerce will be important and necessary.

5.3 SUGGESTIONS FOR ACTION BY INDIVIDUAL SMEs

While this project was not intended specifically to develop an agenda for individual SMEs, some conclusions can be drawn both from the study and from PricewaterhouseCoopers' experience in advising enterprises about electronic commerce:

- **The Internet is a source of business information.** While many SMEs feel they lack information on electronic commerce best practices or success stories, one of the most useful sources of information may be the Internet itself. Browsing the Internet for examples of e-commerce use by competitors, suppliers, customers and counterparts at home or in other economies is a low-cost source of business intelligence, as well as a practical way of gaining familiarity with the medium.
- **Business-to-business (B-to-B) electronic commerce is an important market for SMEs.** SMEs in lower-GNP economies in particular might concentrate initially on business-to-business electronic commerce where other businesses are the main customers or suppliers. This focus may be necessary until the domestic (and international) consumer market develops sufficiently to sell specific products or services directly to consumers.
- **SMEs should consider international markets.** Electronic commerce allows SMEs to market their products or services directly to businesses and consumers throughout the world. However, this approach should only be implemented when the SME has developed the capabilities and taken all necessary steps to supply the international market.
- **The Internet and electronic commerce can facilitate business partnerships.** In some cases, the Internet can be used to form closer partnerships with complementary businesses, either domestic or international. For example, SMEs may be able to overcome high costs of entry and concerns about legal and security issues by participating in web-based networks of buyers or sellers.
- **Business costs can be reduced through electronic commerce.** While SMEs commonly think about the Internet as a means of reaching more customers, the most immediate business case justification may be cost reduction, such as looking for additional sources of supply or cheaper materials purchases. Using the Internet for this purpose generally requires less investment than creating and maintaining a web site for product sales or service.
- **New products or services can be created through electronic commerce.** As they develop their sales and service capabilities over the Internet, SMEs should use the medium not just to promote existing products and services but also to identify and provide greater customization of products and services.

5.4 FURTHER RESEARCH

This study examined opportunities and barriers to adoption of electronic commerce by SMEs from all industry sectors in 21 APEC member economies and it identified measures which participating SMEs believe should be taken by governments and others to facilitate greater adoption of electronic commerce by SMEs.

In developing specific individual or collective action plans for electronic commerce development, APEC economies, either individually or collectively, may want to undertake further research on SMEs to support policy objectives in several areas. The following suggestions for further research could be implemented as separate research initiatives, or some of them might be drawn together into a larger research initiative. Accordingly, further research to support e-commerce adoption, uptake and use by SMEs in APEC economies could include:

- **E-commerce use by SMEs in specific industry sectors.** A focused understanding of particular opportunities and challenges for SME adoption of e-commerce within an industry (e.g. financial services, transportation, communications, retail sales, software development, manufacturing) would assist APEC economies in developing policies or programs to encourage e-commerce uptake among SMEs within that industry.
- **SME e-commerce best practices and case studies.** SMEs expressed the need for examples of successful e-commerce use in situations that are relevant for SMEs in various APEC member economies. Wider dissemination of e-commerce best practices would encourage uptake by SMEs in the APEC region.
- **New business models for electronic commerce.** A typology and analysis of business models, business networks and communities of interest would provide SMEs with an understanding of the range of business models and e-commerce options that are available.
- **The role of electronic commerce in facilitating SME involvement in international trade.** Greater access to international customers and markets is a key potential benefit of electronic commerce for SMEs. A study of the opportunities and impediments for international trade among SMEs would help economies develop their e-commerce trade policies and programs.
- **Payment systems appropriate for use by SMEs.** SMEs in several APEC economies indicated that electronic payment systems suitable for SMEs are not readily available to support electronic commerce transactions. A study of appropriate payment systems for SMEs including legal, technical, financial and business aspects would be very beneficial.

- **Relationships between SMEs and larger national and multinational enterprises.** An examination of business-to-business e-commerce and new supply chain relationships between SMEs and large firms that are facilitated through electronic commerce would provide important guidance for APEC economies to foster and encourage these relationships.
- **Time series analysis of SME e-commerce opportunities and barriers.** A periodic survey of SME capabilities and perceptions of e-commerce opportunities and barriers in APEC economies would assist economies to develop measures that are current with the rapid development of e-commerce markets.

Further research in these areas will be important in developing specific individual and collective plans for the development of electronic commerce by SMEs in the APEC economies.